Courses

A&VS 105. Professional Orientation. 2 Hours.
PR: Freshman standing or consent. Orientation to WVU and the academic programs in the Division of Animal and Veterinary Sciences; related career and professional opportunities. Field trips required.

A&VS 150. Introduction to Animal Science. 2 Hours.
Survey of major disciplines in animal and veterinary sciences with emphasis on related terminology; study of the development of breeds of livestock and their identification.

A&VS 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

A&VS 199. Orientation to Biochemistry. 1,2 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities and opportunities.

A&VS 251. Principles of Animal Science. 4 Hours.
PR: Corequisite of A&VS 251L. A comparative study of the production of meat, milk, eggs and wool. Nutrition, physiology genetics, hygiene and physical environment, and economics are discussed as bases for sound managerial decisions.

A&VS 251L. Principles of Animal Science Laboratory. 0 Hours.
PR: Corequisite of A&VS 251. Principles of Animal Science - A&VS 251 Laboratory.

A&VS 275. Companion Animal Science. 3 Hours.
Basic physiology, nutrition and genetics; economic and ethical consideration of pet ownership; benefits of companion animals in society; aspects of handling and training, behavior, and common health diseases and parasite problems of pet animals.

A&VS 276. Service Dog Training. 3 Hours.
Current principles, theory, and practices for training service dogs.

A&VS 277L. Service Dog Training Laboratory. 1 Hour.
PR: A&VS 276 with a minimum grade of C-. Through hands-on training, students will apply their knowledge of animal training following programmatic procedures for training dogs to have basic obedience skills and perform advanced service dog tasks. Students will use the most modern, professional, and ethical techniques for training mobility-assistance and psychiatric service dogs.

A&VS 281. Introduction to Equine Care and Use. 3 Hours.
Survey of basic equine care, breeds, use, management, and behavior with a lab in equine safety and handling.

A&VS 282L. Equine Handling & Ground Training Laboratory. 1 Hour.
PR: A&VS 281. This introductory course provides students with hands-on skills to safely handle and train horses from the ground. Students will learn to identify equine body language, and understand how their body language, position, and use of aids can be used to teach horses from the ground.

A&VS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

A&VS 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

A&VS 330. Equine Facility Design and Management. 3 Hours.
PR: A&VS 281. Design of safe, functional equine facilities. Business, legal, environmental, and other issues involved with running an equine facility.

A&VS 343. Equine Hoof and Limb. 3 Hours.
Students in this course gain in-depth knowledge of the anatomy and physiology of the equine hoof and limb. Students will study tendons, ligaments, bones, soundness, hoof structure, shoeing principles, laminitis, and navicular disease.

A&VS 370L. Riding Theory and Techniques Laboratory. 3 Hours.
PR: A&VS 282 or A&VS 282L with a minimum grade of C-. Advanced methods and techniques for performance in hunter and stock horse events; anatomical, physiological, and psychological implications; preparation of horses and riders.

A&VS 372. Careers in the Equine Industry. 3 Hours.
Provides an in-depth understanding of the careers available in the equine industry and prepares students to enter the job market.

A&VS 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

A&VS 402. Values and Ethics. 3 Hours.
PR: Senior standing or consent. Current ethical aspects in agriculture and forestry and their impact on societal values.

A&VS 404. Career Development. 1 Hour.
Identification of career opportunities and preparation of employment applications. Development of personal skills for interviewing for employment.

A&VS 409. Food Animal Diseases. 3 Hours.
PR: Junior and above or consent. General discussion of diseases, disease processes and management affecting farm animals excluding horses.

A&VS 410L. Calving Management Laboratory. 3 Hours.
PR: ANNU 260 and Junior standing. Application of current management practices for calving beef cows for early calf management and for service sire selection.

A&VS 411L. Dairy Heifer Management Laboratory. 3 Hours.
PR: ANNU 260 and Junior standing. Application of current management practices for raising dairy calves from birth through establishment of pregnancy.

A&VS 412L. Lambing Management Laboratory. 1 Hour.
PR: ANNU 260 and Junior standing. Application of current management practices for lambing ewes and lamb management from birth through first months of life.

A&VS 413. Camelid Physiology & Management. 3 Hours.
PR: Junior standing and ANNU 260. Application of current management practices for alpaca management.

A&VS 425L. Principles of Therapeutic Horsemanship 1 Laboratory. 3 Hours.
Explores the history, organization, principles, and procedures of an equine assisted activities and therapies program with the use of therapy horses for persons with disabilities.

A&VS 426L. Principles of Therapeutic Horsemanship 2 Laboratory. 3 Hours.
PR: A&VS 425 or A&VS 425L. Expand knowledge of therapeutic horsemanship based on their learning from A&VS 425. Criteria for becoming a professional in equine assisted activities and therapy fields will be emphasized.

A&VS 435. Marketing Registered Livestock. 3 Hours.
PR: Junior standing or consent. Application of strategies for marketing animals in the registered livestock industry in West Virginia and the surrounding states.

A&VS 451. Current Literature in Animal Science. 3 Hours.
PR: ANNU 260. Evaluation of current research in animal science; its application to production and management. Note: Previously listed as ANPR 250.

A&VS 461. Racehorse Industry Tour. 3 Hours.
Travel course designed to introduce students to the Thoroughbred and Standard-bred Racing Industries, including career opportunities and current events within it.

A&VS 462. Performance Horse Industry Tour. 3 Hours.
Travel course designed to introduce students to the various aspects of the Performance Horse Industry, including career opportunities and current events within it.

A&VS 463. Equine Events Management. 3 Hours.
Planning, marketing, facility preparations and horse show management necessary to run a successful nationally-sanctioned equine event.

A&VS 476L. Animal Assisted Activities and Therapy Laboratory. 3 Hours.
PR: A&VS 276. Lecture and laboratory sessions focus on Animal Assisted Activities and Therapies. Students will learn to critically evaluate the research in this area and will learn hands-on about implementing Animal Assisted Activities with varying populations.

A&VS 480. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480, the student must: (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480A. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480A, the student must: (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480B. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480B, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtained approval from the instructor assigned the course responsibility.

A&VS 480C. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480C, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480D. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480D, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480E. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480E, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtained approval from the instructor assigned the course responsibility.

A&VS 480F. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480F, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480G. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480G, the student must (1) be in good standing, (2)obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480H. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480H, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480I. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480I, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480J. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480J, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480K. Assigned Topics. 1-6 Hours.
To be eligible to register in A&VS 480K, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480L. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480L, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480M. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480M, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480N. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480N, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480O. Assigned Topics. 1-4 Hours.
To be eligible to register for A&VS 480O, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480P. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480P, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480Q. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480Q, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480R. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480R, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480S. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480S. the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480T. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480T, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480U. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480U, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480V. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480V, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480W. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480W, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480X. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480X, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480Y. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480Y, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 480Z. Assigned Topics. 1-4 Hours.
To be eligible to register in A&VS 480Z, the student must (1) be in good standing, (2) obtain approval of the instructor supervising the topic, and (3) obtain approval from the instructor assigned the course responsibility.

A&VS 481L. Volunteerism for Equine Assisted Activities and Therapies Laboratory. 3 Hours.
Discuss and demonstrate the importance of the role of the volunteer in the equine assisted activities and therapies fields.

A&VS 482. Practicum for Equine Assisted Activities and Therapies Instructor Certification. 3 Hours.
Prepares therapeutic riding instructors for certification within the guidelines fo the Professional Association of Therapeutic Horsemanship (PATH).

A&VS 486L. Advanced Service Dog Training Laboratory. 3 Hours.
PR: A&VS 276 with a minimum grade of C-. Students will train advanced commands to psychiatric and mobility service dogs in training. Topics covered include dog selection, temperament testing, training methods, and legal issues.

A&VS 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

A&VS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

A&VS 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

A&VS 493. Special Topics. 6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

A&VS 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

A&VS 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.

A&VS 496. Senior Thesis. 1-3 Hours.
PR: Consent.

A&VS 497. Research. 1-6 Hours.
Independent research projects.

A&VS 498. Honors. 1-3 Hours.
PR: Students in honors program and consent by the honors director. Independent reading, study or research.

A&VS 499. Global Service Learning. 3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

ACCT 201. Principles of Accounting 1. 3 Hours.
This course introduces basic concepts of financial and managerial accounting with emphasis on how accounting reports are used by internal and external users.

ACCT 202. Principles of Accounting 2. 3 Hours.
PR: ACCT 201 with a minimum grade of C-. This course introduces financial accounting concepts and reporting with an emphasis on measuring, recording and reporting transactions for business entities.

ACCT 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ACCT 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ACCT 311. Intermediate Accounting. 3 Hours.
PR: WVU sections require ACCT 201 and ACCT 202 with a grade of B- or better in each and PR or CONC: ACCT 321, WVUIT sections require ACCT 201 and ACCT 202 with a grade of C- or better. Development of accounting theory and practice, with emphasis on asset accounting.

ACCT 312. Intermediate Accounting. 3 Hours.
PR: ACCT 311 with a grade of C- or better. Theory and practice of accounting for liabilities, revenue recognition, and stockholders' equity; financial statement preparation.

ACCT 321. Introduction to Accounting Systems. 3 Hours.
PR: ACCT 202 with a minimum grade of B- and (CS 101 or BCOR 121) with a minimum grade of C-. Manual and automated accounting procedures emphasizing the accounting cycle, internal controls, and data analysis software certification.

ACCT 322. Accounting Systems. 3 Hours.
PR: ACCT 321 and BCOR 330 with a minimum grade of C- in each. Analysis of accounting data using current technologies to assist in accounting and business decisions.

ACCT 331. Managerial Accounting. 3 Hours.
PR: ACCT 201 with a minimum grade of C-. This course is intended for non-accounting majors. Analysis of internal accounting practices with emphasis on use of data for performance evaluation, control, motivation, through accounting systems, and decision-making. (No credit available to students having credit for ACCT 431 and ACCT 432.).

ACCT 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ACCT 415. Advanced Accounting. 3 Hours.
PR: ACCT 312 and (ACCT 321 or ACCT 323). Accounting for business combinations, consolidations, foreign currency translation, governmental and nonprofit entities, and equity method investment accounting.

ACCT 425. Accounting Analytics. 3 Hours.
PR: ACCT 311 and ACCT 321 with a minimum grade of C- in each. This course introduces students to higher order business analytics methods, and topics that impact the way businesses make decisions that are relevant to the field of accounting. Topics such as data collection, data technologies, and data mining are covered focusing on impacting business outcomes. Cannot get credit for both ACCT 425 and BUDA 450.

ACCT 426. Analytics for Accounting Analysis. 3 Hours.
PR: (ACCT 425 or BUDA 450) with a minimum grade of C-. This course enables students to use higher order concepts and models in data mining that impact business that are relevant to the field of accounting. Concepts such as supervised and unsupervised learning will be covered, with a focus on business outcomes, cases, and communication. Cannot get credit for ACCT 426 and BUDA 451.

ACCT 427. Accounting Information Systems Audit. 3 Hours.
PR: ACCT 321 with a minimum grade of C-. Course provides an overview of the information technology (IT) audit function from an information systems administration perspective. This course will examine in detail how to build and manage an effective IT audit operation capable of analyzing, assessing, and evaluating physical, technical, and operational cybersecurity controls using information systems auditing standards and frameworks.

ACCT 431. Cost Management. 3 Hours.
PR: ACCT 202 with a minimum grade of B-. Strategic cost management concepts and techniques used for decision making, control, and product and service costing.

ACCT 440. Introduction to Income Taxation Accounting. 3 Hours.
PR: ACCT 311 with a minimum grade of C-. This course provides and introduction and overview of overview of U.S. federal income taxation of individuals, partnerships, corporations, and property transactions.

ACCT 441. Individual Income Tax Accounting. 3 Hours.
PR: ACCT 440 with a minimum grade of C-. An advanced study of Federal income taxation of individuals, flow-through entities, and property transactions.

ACCT 442. Entity Income Tax Accounting. 3 Hours.
PR: WVU sections require ACCT 440 with a minimum grade of C-, WVUIT sections require ACCT 441 with a minimum grade of C-. An advanced study of Federal income taxation of corporations, estates, trusts, exempt organizations, multi-state and international transactions, and financial reporting obligations related to tax transactions.

ACCT 445. Corporate Financial Management. 3 Hours.
PR: (ACCT 311 or ACCT 321) with a minimum grade of C-. This course provides students with the essential competencies associated with corporate financial management / controllership, including cash management, performance measurement, budgeting, fraud prevention and establishing codes for corporate ethical behavior.

ACCT 446. Internal Auditing. 3 Hours.
PR: (ACCT 311 or ACCT 321) with a minimum grade of C-. This course provides students with the fundamental knowledge and skills needed to succeed as entry-level internal audit professionals.

ACCT 451. Auditing Theory. 3 Hours.
PR: ACCT 312. Standards and procedures related to the independent audit of financial statements.

ACCT 452. Assurance Services and Professional Standards. 3 Hours.
PR: ACCT 451 with a minimum grade of C-. Course exposes students to the professional objectives, principles, and standards for assurance services, including risk assessment, attestation reports, and related communications. Develop and apply assurance services skills and professional standards using a hands-on experiential learning approach.

ACCT 461. Accounting for Nonbusiness Entities. 3 Hours.
PR: ACCT 312 and (ACCT 321 or ACCT 323). Accounting, reporting, and budgeting for governmental and nonprofit entities and the use of fund accounting data for planning and control.

ACCT 479. Fraud Examination Concepts and Practice. 3 Hours.
This course provides students with the fundamental knowledge and skills needed to enter the field of fraud examination in the business fields.

ACCT 480. Forensic Accounting Concepts and Practice. 3 Hours.
This course provides students with the fundamental knowledge and skills needed to enter the field of forensic accounting.

ACCT 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ACCT 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ACCT 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ACCT 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses. (Maximum of nine semester hours in any or all courses numbered 493 offered by the College of Business and Economics may be applied toward bachelor's and master's degree.).

ACCT 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ACCT 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ACCT 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ACCT 497. Research. 1-6 Hours.
Independent research projects.

ACCT 498. Honors. 1-3 Hours.
PR: Students in honors program and consent by the honors director. Independent reading, study or research.

ACE 106. Athletic Coaching Education. 3 Hours.
Overview of athletic coaching profession including careers opportunities, critical current issues/trends, professional standards and the professional organizations.

ACE 110. The Science of Coaching Youth Ice Hockey. 3 Hours.
This course offers a comprehensive foundation in the science of coaching youth ice hockey, blending theoretical principles with practical application to prepare students for youth coaching roles at all levels of the sport.

ACE 149. Introduction to Applied Anatomy. 3 Hours.
This course introduces basic structure and function of the human body and examines the underpinning anatomy and applied science of human movement, often through a physical activity and sport performance lens.

ACE 168. Sport Officiating. 3 Hours.
Study of the art, science, industry standards, and best practices of the officiating profession across all levels of sport. This is an undergraduate lecture and interaction based course that will require students to read, interact, synthesize information pertaining to the professional duties and requirements of sports officiating profession.

ACE 256. Foundations of Coaching. 3 Hours.
Designed to teach students the foundations and principles of athletic coaching.

ACE 257. Assessment and Monitoring in Strength and Conditioning. 3 Hours.
This course focuses on developing the skills needed to develop and implement appropriate monitoring and training evaluation plans in sport training. Additionally, students will learn to evaluate technology based tools to allow coaches to optimizing the training process and training adjustment decisions.

ACE 265. Sport is Life. 3 Hours.
This course examines access to sport and physical activity. Topics related to participation are explored, with a focus on practical strategies for increasing opportunities for all in sport and physical activity settings.

ACE 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ACE 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ACE 307. Applied Sport Physiology. 3 Hours.
Examines the application of physiological principles of sport and physical activity training on physical fitness and sport performance in humans.

ACE 310. Coaching Pedagogy. 3 Hours.
Pedagogical theory applied to coaching context, including roles and responsibilities, planning, instruction and feedback, and assessment for sport contexts.

ACE 327. Applied Biomechanics. 3 Hours.
Fundamentals of kinematics and kinetics related to human movement. Basics of biomechanics applied to the concepts of injury prevention and performance improvement. Overview of various biomechanical data collection and analysis.

ACE 357. Techniques of Coaching: Swimming. 2 Hours.
Designed to permit students to gain athletic coaching experience through a supervised on-site experience with a varsity athletic team.

ACE 369. Foundations of Strength and Conditioning. 3 Hours.
Present basic exercise performance methodologies to assist in coaching athletics. Types of training include speed drills, agility drills, conditioning workouts, flexibility exercises, balance- improvement drills, and proper training-environment safety techniques.

ACE 371. Coaching and Cueing in Strength and Conditioning. 3 Hours.
Hands-on experience performing and coaching exercises to improve athletic performance. Specifics include resistance training, core exercises, proprioception rehabilitation, injury prevention, flexibility exercises, plyometric and explosive techniques, speed training, agility exercises.

ACE 374. Fitness Field Testing. 3 Hours.
Provide content knowledge and practical experience concerned with health screening, fitness testing, assessment and evaluation. Content needed for ACE national certification exam.

ACE 387. Periodization and Programming in Strength and Conditioning. 3 Hours.
Present optimal training for athletics of different sports in trained and untrained states. Specific protocols in resistance training and conditioning, correcting specific running and speed mechanics and agility movements.

ACE 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ACE 410. Training Theories for Coaches. 3 Hours.
Application of sport training theories to building, designing and assessing athlete training plans, seasonal team development and long term athlete development from physical literacy to peak performance at all participation levels.

ACE 430. Coaching Program Administration. 3 Hours.
An administrative focus of leadership, finance, fundraising, planning, facility development, personnel supervision, public relations, rules and regulations, purchase and care of equipment and the conducting of athletic events.

ACE 453. Applied Sport Science Stats. 3 Hours.
PR: ACE 457 and STAT 211 with a minimum grade of C- in each. Applied statistics in sport science includes a review of basic research design, data collection in applied athletic settings, the selection and use of appropriate statistical procedures in sport science, as well as data visualization techniques that can be used to make decisions regarding athlete status.

ACE 458. Internship: Practicum & Data Collection. 3 Hours.
PR: ACE 457 with a minimum grade of C-. Practical internship experience preparing training and competition monitoring programs as well as monitoring and collecting sport training and sport performance data using sport technologies.

ACE 459. Internship: Practicum & Data Analysis. 3 Hours.
PR: ACE 458 with a minimum grade of C-. Practical internship experience analyzing training and competition monitoring data and utilizing it for coaching based decisions using sport technologies.

ACE 468. Sport Movement Analysis. 3 Hours.
PR: PET 124 and PET 125 with a minimum grade of C- in each. This course is designed to introduce a prospective coach to the principles of human movement.

ACE 469. Basic Strength and Conditioning for Coaches. 3 Hours.
Present basic exercise performance methodologies to assist in coaching athletics. Types of training include speed drills, agility drills, conditioning workouts, flexibility exercises, balance- improvement drills, and proper training-environment safety techniques.

ACE 471. Gender and Sport. 3 Hours.
Explore the history of sex and gender in sport, and investigate how sex and gender have influenced opportunities and experiences in sport for participants, coaches, administrations, parents, and fans.

ACE 475. Capstone Strength and Conditioning. 3 Hours.
PR: ACE 469 and ACE 473 and ACE 487 and HN&F 200 with a minimum grade of C- in all. Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors in strength and conditioning environment. Involves temporary placement with public or private enterprise for professional competence development.

ACE 488. Practicum Coaching Exceptional Athletes. 3 Hours.
Integration of theoretical knowledge and development issues with practical field experiences working with athletes with disabilities.

ACE 489. Practicum Coaching Youth Sport. 3 Hours.
PR: ACE 256, PET 244, and one of the ACE Techniques of Coaching. Integration of theoretical knowledge and development issues with practical field experiences in coaching youth.

ACE 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ACE 491. Professional Field Experience. 1-6 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ACE 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ACE 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ACE 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ACE 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ACE 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ACE 497. Research. 1-6 Hours.
Independent research projects.

ACE 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ADPR 215. Introduction to Advertising and Public Relations. 3 Hours.
PR: College of Media majors only. This introductory course in strategic communications provides a broad overview of professional advertising and public relations practices and their role in society. (Course is equivalent to ADV 215, PR 215, & STCM 215.).

ADPR 319S. Creative Design and Strategy. 3 Hours.
PR: (ADPR 215 or ADV 215 or PR 215 or STCM 215) with a minimum grade of C-. Editing and production techniques for public relations and advertising media (brochures, reports, newsletters, etc.,) including copy preparation, typography, graphic design, layout and desktop publishing.

ADPR 410. Influencer Strategies. 3 Hours.
PR: (JRL 101 or MDIA 101) and (ADPR 215 or ADV 201 or ADV 215 or PR 215 or STCM 215) with a minimum grade of C- in each. This course explores the role of influencer marketing in meeting marketing goals. Students will learn how to strategically plan an influencer campaign by discovering the campaign performance metrics (KPIs) that most accurately measure campaign success (ROI), budgeting influencer opportunities, and carrying out channel selection. Students will also contemplate the future of influencer marketing and its many prospective implications.

ADPR 421S. Advertising & PR Audience Insights & Analysis. 3 Hours.
PR: (ADV 315 or ADV 315S or PR 324 or PR 324S or STCM 315) with a minimum grade of C-. This course focuses on in-depth examination of the multi-faceted world of advertising and public relations research, and the array of complex tools used to produce meaningful results. (Also listed as ADV 421, PR 422, & STCM 521).

ADPR 435S. Visual Brand Storytelling. 3 Hours.
PR: (MDIA 215 or MDIA 215S or JRL 215) and (MDIA 225 or MDIA 225S or JRL 225) and (ADPR 215 or ADV 215 or PR 215 or STCM 215) with a minimum grade of C- in each. In this class, students will tell character, culture and place-driven stories that connect emotionally with a target audience. Students will collaborate with a client to produce real-world outcomes that are based on creative strategy and messaging. Through the use of traditional visual mediums and emerging technology students will plan, produce and publish content for print and digital platforms.

ADPR 439. Strategic Social Media. 3 Hours.
PR: JRL 101 or MDIA 101 and (ADPR 215 or ADV 201 or ADV 215 or PR 215 or STCM 215 or IMC 215) with a minimum grade of C- in each. This online majors-only course is an accelerated examination of the social media landscape with a focus on crafting messages and successful case studies related to how social media channels can be strategically used to meet the goals of corporate, non-profit, political and issue-based outreach messaging.

ADPR 450. Audience Psychology and Behavior. 3 Hours.
PR: ADPR 215 or IMC 215 with a minimum grade of C-. This course is designed to be an introduction to the underlying theories and research that influence strategic communication and explain how strategic communication affects audiences. The course will focus on individual-oriented theories in communication, advertising, public relations, psychology and marketing. More specifically, students will be acquainted with a variety of theoretical perspectives in audience perception, learning, memory, attitudes, and behavior.

ADPR 452. Strategic Communication Strategy and Management. 3 Hours.
PR: (JRL 101 or MDIA 101) and (JRL 215 or MDIA 215) and (ADPR 215 or ADV 215 or PR 215 or STCM 215) with a minimum grade of C- in each. This course covers strategic communications from a client's perspective and includes campaign planning and management of various marketing communication agencies.

ADPR 457S. Martin Hall Agency Experience. 3 Hours.
PR: (ADPR 421 or ADPR 421S or STCM 421) and (ADV 315 or ADV 315S or PR 324 or PR 324S or STCM 315) with a minimum grade of C- in each. This capstone course is designed as a faculty-advised advertising and public relations agency, designed to provide a real-world professional experience in the university setting. Students manage accounts and work in interactive teams to develop integrated multi-media advertising and public relations strategies, materials and campaigns to address the strategic communication needs of real-world clients.

ADPR 459S. Strategic Communication Campaigns for Public Relations and Advertising. 3 Hours.
PR: (ADV 315 or ADV 315S or PR 324 or PR 324S or STCM 315) and (ADPR 421 or ADPR 421S or STCM 421) with a minimum grade of C- in each. This capstone course synthesizes knowledge from all prior major courses and applies it to the development of a Strategic Communications (Advertising and Public Relations) campaign in a real world environment. (Also listed as ADV 459, PR 459 and STCM 559).

ADPR 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ADPR 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

ADRC 102. Adventure in Society. 3 Hours.
This course explores how outdoor adventure has transformed from a daily necessity for survival in early cultures to its modern form of recreational pursuit. Through readings, media, lectures and hands-on adventure experiences students explore historical and modern perspectives of popular adventure pursuits and their societal influence.

ADRC 111. Introduction to Whitewater Rafting. 1 Hour.
Introductory skills course in navigating class II-III whitewater in inflatable watercraft. Content includes equipment selection and care, river features and hazards, paddle strokes, steering, whitewater maneuvers and basic rescue techniques. Must meet essential eligibility requirements to participate.

ADRC 112. Whitewater Rafting Techniques. 1 Hour.
PR: ADRC 111 or permission of the instructor. Whitewater raft skill development course designed to build intermediate skills on class III-IV whitewater. Includes intermediate paddle raft maneuvers, oar-rig operation and self-recovery techniques. Must meet essential eligibility requirements to participate.

ADRC 121. Introduction to Rock Climbing. 1 Hour.
Introduction to rock climbing skills. Content includes skills necessary to climb and belay using a top-rope system both on artificial and natural climbing surfaces. Must meet essential eligibility requirements to participate.

ADRC 122. Rock Climbing Techniques. 1 Hour.
PR: ADRC 121 or permission of the instructor. Rock climbing skill development course focused on building proficiency for independent set-up and safe climbing practices in a top rope climbing setting. Must meet essential eligibility requirements to participate.

ADRC 131. Introduction to Mountain Biking. 1 Hour.
Introduction to mountain biking and riding techniques. Foundational content and practice on biking skills, etiquette, and technical knowledge. Must meet essential eligibility requirements to participate.

ADRC 211. Introduction to Whitewater Raft Guiding. 1 Hour.
PR: ADRC 112 or permission of the instructor. Introduces methods and skills of commercial raft guiding on class III-IV whitewater. Emphasis is placed on customer care, building a short-term paddling team, effective communication and group safety. Must meet essential eligibility requirements to participate.

ADRC 212. Swiftwater Rescue. 1 Hour.
PR: ADRC 111 or permission of the instructor. Introductory theory and skills in self and group rescue techniques of paddlers in swiftwater settings. Instruction emphasizes recognition and avoidance of common river hazards, personal/group safety, throw bag use, rope/boat/wading-based rescues, rescue PFD use and mechanical advantage systems. Must meet essential eligibility requirements to participate.

ADRC 221. Lead Climbing. 1 Hour.
PR: ADRC 122 or permission of the instructor. Introduces experienced top rope climbers to techniques and skills required to lead climb bolted sport and traditional lead routes. Emphasis on safety practices, equipment, lead climbing knots, lead belay technique, bolt assessment, route finding, traditional gear placement and anchor cleaning. Must meet essential eligibility requirements to participate. Must have the ability to climb 5.8 on a top rope.

ADRC 222. Climbing Rescue Techniques. 1 Hour.
PR: ADRC 122 or permission of the instructor. Introduces theory and skills in self and group rescue for climbers in high angle terrain. Content includes vertical rescue management, belay escapes, ascending ropes, mechanical advantage systems, lowering systems, rescue rappels and counter-balance systems. Must meet essential eligibility requirements to participate.

ADRC 311. Whitewater Raft Trip Leadership. 1 Hour.
PR: ADRC 211 or permission of the instructor. Advanced skill course focused on methods and skills needed to lead whitewater paddling day trips primarily in rafts. Hands-on activities focus on site selection, equipment, logistics, permits, risk management, on-river trip management and group safety. Must meet essential eligibility requirements to participate.

ADRC 321. Rock Climbing Instructor Development. 1 Hour.
PR: ADRC 221 and must meet essential eligibility requirements to participate plus also have at least one year of personal climbing experience or permission of the instructor. Advanced skill course focused on development of instructional skills in rock climbing. Hands-on activities emphasize climbing site selection, risk management, technical skills as well as key instructional skills. Rock Climbing resume must show more than 20 single pitch traditional gear protected leads over 5.6 difficulty and can comfortably climb 5.8 routes on top rope at time of course.

ADV 201. Advertising and Society. 3 Hours.
As a social institution, advertising plays a critical role in our daily lives. This course examines the social, economic, and legal aspects of advertising.

ADV 215. Principles of Advertising. 3 Hours.
(Open to all University students.) An introduction to all sides of the advertising field and to the process, quantitative, strategic and aesthetic, by which the sales message is planned, produced and delivered. Students cannot receive credit for both ADV 215 and STCM 215 or ADPR 215, which is considered an equivalent course.

ADV 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ADV 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ADV 309. Advertising and Creativity. 3 Hours.
PR: (ADV 201 or ADV 215) and (JRL 101 or MDIA 101) with a minimum grade of C- in each. (Advertising minors only.) Examines advertising copy and design concepts. Students develop their own advertisements and learn to critically analyze existing ad campaigns.

ADV 315S. Advertising Copywriting. 3 Hours.
PR: (ADPR 215 or ADV 215 or STCM 215) and (MDIA 215 or MDIA 215S) with a minimum grade of C-. Students will learn to write advertising copy and design effective layouts for targeted audiences. Focuses on creative ideation process and includes advertising graphics, copy preparation and layout, evaluation and selection of media. Developing a portfolio.

ADV 333S. Portfolio. 3 Hours.
PR: ADPR 215 with a minimum grade of C-. Develop a series of advertising campaigns to create an entry-level, professional portfolio. Learn to interpret market research and strategic planning to create breakthrough creative expressions. Gain an understanding of best practices in copywriting and art direction/design. Learn the skills to craft messages for diverse audiences. Show how concepts must work across all media, including print, digital, video, and experiential.

ADV 347S. Martin Hall Agency: Advertising Tactics. 3 Hours.
PR: (ADV 315 or ADV 315S or PR 324 or PR 324S or STCM 315) with a minimum grade of C-. This course is part of a student-run advertising and public relations agency designed to be the closest to a real-world professional experience as is possible in the university setting. Students will learn about the global and diverse work conducted in an agency setting, while serving in an advertising-related staff position within the Martin Hall Agency.

ADV 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ADV 401S. Creative 1. 3 Hours.
PR: (ADV 315 or ADV 315S or STCM 315) with a minimum grade of C-. This course builds on the processes introduced in Advertising Copywriting. Emphasis on creativity, concept development, idea generation & principles of effective communication using words and visuals in a variety of print, social, digital and broadcast media.

ADV 403. Media Planning/Strategy. 3 Hours.
PR: STCM 215 or ADV 215 or ADPR 215 with a minimum grade of C-. Theory, evaluation and selection of advertising media for a variety of market situations. Market analysis, media characteristics, sources of media data, and development of a media plan.

ADV 409. Advertising Research and Media. 3 Hours.
PR: (ADV 201 or ADV 215) and (JRL 101 or MDIA 101) with a minimum grade of C- in each. (Advertising minors only.) Introduces the selection and evaluation of different media used in advertising campaigns. Students learn to analyze and select audiences, compare media, and conduct media research.

ADV 415. Ideation and Strategic Visualization. 3 Hours.
PR: ADV 315 or STCM 315 with a minimum grade of C-. This course builds on basic copywriting skills and explores the global media channels used to reach diverse target audiences. Students will analyze award-winning campaigns as a means to understand creative ideation and strategic visualization. Efforts will culminate in the production of advertising executions.

ADV 419. Advertising Strategies. 3 Hours.
PR: (ADV 201 or ADV 215) and (JRL 101 or MDIA 101) with a minimum grade of C- in each. (Advertising minors only.) Introduces students to the concept of branding. Students learn how to use advertising to help create powerful brand loyalty by analyzing case studies of successful and unsuccessful branding attempts.

ADV 451. Interactive Marketing Communications. 3 Hours.
PR: STCM 215 and STCM 315. An examination of the concepts, strategies and applications involved in direct marketing. Measurability, accountability, lists, data and the integration of direct marketing program into total marketing efforts are discussed.

ADV 455S. Creative 2. 3 Hours.
PR: (ADV 401 or ADV 401S) with a minimum grade of C-. This course builds on the strategic and creative processes for strategic communication introduced in Creative 1, including design for print, digital broadcast mobile and other media.

ADV 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant. (Course will be graded pass/fail.).

ADV 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hrs.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development. (Course will be graded pass/fail.).

ADV 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ADV 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ADV 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ADV 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ADV 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ADV 497. Research. 1-6 Hours.
Independent research projects.

ADV 498. Honors. 1-3 Hours.
PR: Students in honors program and consent by the honors director. Independent reading, study, or research.

AEM 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

AEM 216. Living in a Microbial World. 3 Hours.
Explores the microbial world's impact on humankind and the evolution of microorganisms from the beginning of life on Earth. Follows the journey of how these microorganisms have fundamentally shaped the world today. Students will learn about microbial diversity, the impact of microbes on human health and society, and the economic impact of microbial processes and products.

AEM 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AEM 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

AEM 341. General Microbiology. 3 Hours.
PR: CHEM 115 with a minimum grade of C- and PR or CONC: AEM 341L. Introductory morphological, cultural, and physiological characteristics of microorganisms; application of microbiology to agriculture, home economics, and health.

AEM 341L. General Microbiology Laboratory. 1 Hour.
PR or CONC: AEM 341. General Microbiology - AEM 341 Laboratory.

AEM 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AEM 401. Environmental Microbiology. 3 Hours.
PR: AEM 341 or consent and PR or CONC: AEM 401L. Microbiology as applied to soil, water, wastewater, sewage, air, and the general environment. Occurrence, distribution, ecology, and detection of microorganisms in these environments. (Also listed as ENVP 401.).

AEM 401L. Environmental Microbiology Laboratory. 1 Hour.
PR or CONC: AEM 401. Environmental Microbiology - AEM 401 Laboratory.

AEM 420. Soil Microbiology. 3 Hours.
PR: AEM 341. Microbiology and biochemistry of the soil environment. Occurrence, distribution, ecology, and detection of micro-organisms in soil. (Also listed as AGRN 420 and ENVP 420.).

AEM 445. Food Microbiology. 3 Hours.
PR: AEM 341. The relationships of microorganisms to food-borne illness and intoxications, microbial food safety and food quality, food spoilage, food preservation and bio-processing. The emerging food preservation and technologies and predictive microbiology will be introduced.

AEM 449. Food Microbiology Lab. 1 Hour.
PR: AEM 445. Laboratory training in methods used in microbiological examination of foods. This laboratory will provide hands-on experience for students who take or have taken AEM 445.

AEM 470. Microbes and Global Change. 3 Hours.
PR: AEM 341. Microbially mediated biogeochemistry of elements important for life with an emphasis on how these processes are being impacted by anthropogenic activities.

AEM 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

AEM 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

AEM 492. Directed Study. 1-3 Hours.
Directed Study, reading, and/or research.

AEM 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AEM 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

AEM 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

AEM 496. Senior Thesis. 1-3 Hours.
PR: Consent.

AEM 497. Research. 1-6 Hours.
Independent research projects.

AEM 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

AFCS 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

AFCS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AFCS 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

AFCS 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AFCS 480. Assigned Topics. 1-4 Hours.
Assigned studies of an interdisciplinary nature with a particular specialty area in agriculture and forestry. Students must be in good standing and have prior approval of a proposed outline from the division director's office.

AFCS 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

AFCS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

AFCS 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

AFCS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AFCS 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

AFCS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

AFCS 496. Senior Thesis. 1-3 Hours.
PR: Consent.

AFCS 497. Research. 1-6 Hours.
Independent research projects.

AFCS 498. Honors. 1-3 Hours.
PR: Students in honors program and consent by the honors director. Independent reading, study or research.

AFCS 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

AGBI 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

AGBI 199. Orientation to Biochemistry. 1,2 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities and opportunities.

AGBI 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AGBI 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

AGBI 386. Undergraduate Research Experience 1. 1,2 Hour.
PR: At least sophomore standing and faculty permission. Students will write a research proposal, conduct supervised research, and write a progress report. This course is the first of a two-course sequence that leads to a research-based capstone experience. Students must also complete AGBI 486 for this to serve as the Biochemistry Capstone course.

AGBI 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AGBI 401. Senior Seminar in Biochemistry. 1 Hour.
PR: Senior standing in biochemistry. Students select a topic at the forefront of biochemistry and gather information on the subject. Students then read, critically evaluate, write about the subject and present the topic in a seminar.

AGBI 403. Applied Biochemistry Literature. 3 Hours.
PR: Senior standing. Biochemistry Capstone Experience involving literature review, grant writing, and orally defending a proposal.

AGBI 410. Introductory Biochemistry. 3 Hours.
PR: CHEM 231 or (CHEM 233 and CHEM 233L). Introduction to chemistry of cellular constituents (proteins, amino acids, carbohydrates, lipids, nucleic acids, enzymes and coenzymes) and their metabolism in animals and plants.

AGBI 410L. Introduction to Biochemistry Laboratory. 1 Hour.
PR or CONC: AGBI 410 or consent. Classic and modern techniques in biochemistry.

AGBI 420. Principles of Biochemistry 2. 3 Hours.
PR: (CHEM 462 and CHEM 462L) with a minimum grade of C- in both and PR or CONC: BIOL 219. In this course, students will study metabolic pathways and their regulation as they relate to the four main classes of biomolecules: Carbohydrates, Lipids, Proteins, and Nucleic Acids. This course serves as the second of a two-semester biochemistry sequence required of all biochemistry majors.

AGBI 420L. Principles of Biochemistry 2 Laboratory. 1 Hour.
PR or CONC: AGBI 420 with a minimum grade of C-. Laboratory study of cellular constituents and their metabolism in animals and plants.

AGBI 480. Assigned Topics. 1-4 Hours.

AGBI 486. Undergraduate Research Experience 2. 2-4 Hours.
PR: AGBI 386 and faculty permission. Continuation of a research-based Capstone Experience where students will conduct supervised research, present their research, and prepare a final report. This course is the second of a two-course research-based sequence and must be completed after AGBI 386 to count as the capstone experience.

AGBI 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

AGBI 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

AGBI 492. Directed Study. 1-3 Hours.
Directed study, reading, and or research.

AGBI 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AGBI 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

AGBI 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.

AGBI 496. Senior Thesis. 1-3 Hours.
PR: Consent.

AGBI 497. Research. 1-6 Hours.
Independent research projects.

AGBI 498. Honors. 1-3 Hours.
PR: Students in honors program and consent by the honors director. Independent reading, study or research.

AGEE 101. Global Food and Agricultural Industry. 3 Hours.
Examination of the history and current developments, structures, functions, and importance of the international food and agricultural industry; issues, concerns and interrelationships and their impacts on American agriculture and society.

AGEE 102. Educational Colloquium in Agricultural and Extension Education. 1 Hour.
Components of and requirements for majoring in agricultural and extension education, including specializations, professional organizations, avenues to program completion, and requirements to be gainfully employed.

AGEE 103S. Basics of Agricultural Mechanization. 3 Hours.
Study and application of the foundation area associated with agricultural mechanization.

AGEE 110. Microcomputer Applications in Agricultural Education. 3 Hours.
PR: Consent. Microcomputer applications in the instructional process of agricultural education; use of applications software, agricultural software, and data bases; and methods of integrating microcomputers into secondary school agriculture and extension programs.

AGEE 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

AGEE 202. Site Based Tutoring in Agriculture and Extension Education. 1 Hour.
Application of models and paradigms of learning in the content area through tutoring of individuals and small groups in an assigned public school setting.

AGEE 203. Agriculture Mechanics Practica. 3 Hours.
Theory and practice of designing and constructing structures, electrical circuits, masonry, equipment maintenance, and surveying.

AGEE 220. Group Organization and Leadership. 3 Hours.
Study of the impact of leaders and organized groups on societies. Role of groups in conveying cultural norms. Principles and techniques involved in forming and directing organizations in providing effective leadership.

AGEE 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AGEE 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

AGEE 303. Small Engines and Hydraulics. 3 Hours.
Theory and practice of disassembling, assembling and maintaining small gasoline engines and hydraulic devices.

AGEE 305. Metal Fabrication. 3 Hours.
Theory and practice of the fusion of metals. Advancing the science, technology and application of welding and allied processes including: joining, brazing, soldering, and cutting.

AGEE 330. Shop Theory and Methods. 3 Hours.
PR: AGEE 103 and AGEE 203. Methods of teaching agricultural mechanics including laboratory safety, organization and supervision.

AGEE 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AGEE 421. Agricultural and Natural Resource Communications. 3 Hours.
Procedures and practices in developing, interpreting, and communicating agricultural and natural resource information; emphasis on visual materials and effective presentations. (3 hr. lec.).

AGEE 426. Directing Future Farmers of America and Supervised Agricultural Experiences. 3 Hours.
This course is specifically designed for students preparing to teach agricultural science in the public schools. Focus will be on planning, advising, supervising and evaluating student educational experiences through FFA and supervised agricultural experience programs.

AGEE 430. Methods of Teaching Agriculture. 2 Hours.
PR or CONC: AGEE 430L with a minimum grade of C- or consent. Organization and preparation for teaching agriculture in middle and secondary schools.

AGEE 430L. Methods of Teaching Agriculture Laboratory. 1 Hour.
PR or CONC: AGEE 430. Methods of Teaching Agriculture - AGEE 430 Laboratory.

AGEE 431. Adult Education in Agriculture and Natural Resources. 2 Hours.
PR: Consent. Planning and preparation for teaching adult classes and advising agricultural organizations.

AGEE 434. Managing Learning Environment. 3 Hours.
PR: AGEE 430 or consent. Principals/process in organizing and managing all components of the secondary agricultural education learning environment to maximize student achievement.

AGEE 438. Agriculture Education Curriculum Development. 2 Hours.
Development, organization, preparation and evaluation of materials/curriculum for teaching agriculture in middle and secondary schools.

AGEE 440. Principles of Cooperative Extension. 2 Hours.
PR: Consent. History, philosophy, and mission of the cooperative extension service. Roles and functions of extension faculty in developing and presenting extension programs.

AGEE 441. Methods in Extension Education. 2 Hours.
PR: Consent. Organization and preparation for extension teaching and the processes of communication.

AGEE 452. Advanced Farm Machinery. 3 Hours.
Systems approach to selection, use and operation of machinery related to agriculture, forestry and other rural activities. Emphasis on safety and environmental impact. Use of records for management decisions, purchase, replacement, sale, or overhaul. (2 hr. rec., 3 hr. lab.).

AGEE 454. Agricultural Mechanics Problems. 1-4 Hours.
PR: C or better in an AGEE course. Special projects and problems in theoretical analysis, design, or construction. (1-4 hr. conference.).

AGEE 454A. Agricultural Mechanics Problems. 1-4 Hours.
PR: C or better in an AGEE course. Special projects and problems in theoretical analysis, design or construction. (1-4 hr. conference.).

AGEE 454B. Agricultural Mechanics Problems. 1-4 Hours.
PR: C or better in an AGEE course. Special projects and problems in theoretical analysis, design, or construction. (1-4 hr. conference.).

AGEE 454C. Agricultural Mechanics Problems. 1-4 Hours.
PR: C or better in an AGEE course. Special projects and problems in theoretical analysis, design, or construction. (1-4 hr. conference.).

AGEE 454D. Agricultural Mechanics Problems. 1-4 Hours.
PR: C or better in an AGEE course. Special projects and problems in theoretical analysis, design, or construction. (1-4 hr. conference.).

AGEE 454E. Agricultural Mechanics Problems. 1-4 Hours.
PR: C or better in an AGEE course. Special projects and problems in theoretical analysis, design, or construction. (1-4 hr. conference.).

AGEE 454F. Agricultural Mechanics Problems. 1-4 Hours.
PR: C or better in an AGEE course. Special projects and problems in theoretical analysis, design, or construction. (1-4 hr. conference.).

AGEE 454G. Agricultural Mechanics Problems. 1-4 Hours.
PR: C or better in an AGEE course. Special projects and problems in theoretical analysis, design, or construction. (1-4 hr. conference.).

AGEE 454H. Agricultural Mechanics Problems. 1-4 Hours.
PR: C or better in an AGEE course. Special projects and problems in theoretical analysis, design, or construction. (1-4 hr. conference.).

AGEE 454I. Agricultural Mechanics Problems. 1-4 Hours.
PR: C or better in an AGEE course. Special projects and problems in theoretical analysis, design, or construction. (1-4 hr. conference.).

AGEE 460. Engineering Technology for Urban Watersheds and Irrigation. 3 Hours.
Soil and water management; analysis of small watersheds and design of waterways, culverts, ponds, sediment basins, and turf irrigation systems. (3 hr. lec.).

AGEE 461. Waste Management-Composting. 3 Hours.
Both present and alternative waste management strategies will be examined. Students will learn how to analyze the waste stream and be able to develop management concepts which are both economically and environmentally sound. Lectures by waste management professionals will be integrated into the class to expose the students to the very latest practices and technology.

AGEE 488. Professional Agricultural Internship. 1-12 Hours.
PR: Consent.

AGEE 489. Agriculture and Extension Education Reflective Seminar. 1 Hour.
Provides opportunities for students to examine their field based experiences. Professional issues and problems are identified and discussed. Ethics and misconceptions about professional practice are examined.

AGEE 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

AGEE 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

AGEE 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

AGEE 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AGEE 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

AGEE 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

AGEE 496. Senior Thesis. 1-3 Hours.
PR: Consent.

AGEE 497. Research. 1-6 Hours.
Independent research projects.

AGEE 498. Honors. 1-3 Hours.
PR: Students in honors program and consent by the honors director. Independent reading, study or research.

AGRL 111. Professions in Agriculture. 1 Hour.
An overview of subject matter related to agriculture in current society. Emphasis on agricultural organizations, environmental and food issues, careers, and programs within the college.

AGRL 112. Professions in Agriculture. 1 Hour.
Continuation of AGRL 111.

AGRL 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

AGRL 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AGRL 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

AGRL 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AGRL 400. Agricultural Travel Course. 1-6 Hours.
Tour and study of production methods in major livestock and crop regions of the United States and other countries. Influence of population, climate, soil, topography, markets, labor, and other factors on agricultural production.

AGRL 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

AGRL 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

AGRL 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

AGRL 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AGRL 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

AGRL 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

AGRL 496. Senior Thesis. 1-3 Hours.
PR: Consent.

AGRL 497. Research. 1-6 Hours.
Independent research projects.

AGRL 498. Honors. 1-3 Hours.
PR: Students in honors program and consent by the honors director. Independent reading, study or research.

AGRN 120. Principles of Agroecology. 3 Hours.
Agroecology is the study of interactions among organisms and the environment in agricultural systems and broader interactions with the biosphere to meet human needs and provide ecosystem services while minimizing their ecological footprint. We will explore the structure and function of agroecosystems across a range of climate, landscape/soil, and crop and animal components.

AGRN 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AGRN 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

AGRN 315. Turfgrass Management. 3 Hours.
PR: AGRN 202 and AGRN 203 and PLSC 206 or consent. Establishment, maintenance and adaptation of grasses for lawns, golf courses, parks, athletic and playing fields, and roadsides. Associating differential plant responses with soil, climatic and biotic factors. (3 hr. lec.).

AGRN 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AGRN 451. Principles of Weed Science. 2 Hours.
PR: ESWS 202 and ESWS 202L and PLSC 206 or consent and PR or CONC: AGRN 451L. Fundamental principles of weed science including identification, ecology, and control in crops. (Also listed as ENVP 451.).

AGRN 451L. Principles of Weed Science Laboratory. 1 Hour.
PR or CONC: AGRN 451. Principles of Weed Science - AGRN 451 Laboratory.

AGRN 452. Grain and Special Crops. 3 Hours.
PR: PLSC 206 and AGRN 202 and AGRN 203 or consent. Advanced study of methods in the production of grain and special crops. Varieties, improvement, tillage, harvesting, storage, and use of crops grown for seed or special purposes.

AGRN 454. Forage Crops. 3 Hours.
PR: PLSC 206 and AGRN 202 and AGRN 203 or consent. All phases of forage crop science including ecology, taxonomy, management practices used for the production of forage and seed, and forage composition, quality, and utilization. (3 hr. lec, 1 hr. lab.).

AGRN 480. Field Methods and Case Studies in Agroecology. 3 Hours.
PR: AGRN 120 and PLSC 206 and BIOL 350 and AGRN 410 and ENTO 404 and PPTH 401. This is a capstone course for the Agroecology major. The main goal of the course is to develop independent thinkers and professionals in the field of agroecology, including proficiency in use of field and analytical methods for assessment of the structure and function of agroecosystems and support of management decisions.

AGRN 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

AGRN 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

AGRN 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

AGRN 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

AGRN 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

AGRN 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.

AGRN 496. Senior Thesis. 1-3 Hours.
PR: Consent.

AGRN 497. Research. 1-6 Hours.
Independent research projects.

AGRN 498. Honors. 1-3 Hours.
PR: Students in honors program and consent by the honors director. Independent reading, study or research.

ANES 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANES 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ANES 491. Professional Field Experience. 1-18 Hours.
PR: Consent (may be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ANES 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANES 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANES 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANES 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ANES 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ANES 497. Research. 1-6 Hours.
Independent research projects.

ANES 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

ANNU 260. Animal Nutrition. 3 Hours.
PR: Two courses in chemistry. Digestion and metabolism of food nutrients, nutrient requirements of farm animals, and nutritive values of feeds and rations.

ANNU 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANNU 361. Applied Nutrition. 3 Hours.
PR: ANNU 260. Feedstuffs, feed processing storage and additives, nutrient requirements and ration formulation for beef and dairy cattle, sheep, and horses. (2 hr. lec., 1 hr. lab.).

ANNU 362. Applied Nutrition 2. 3 Hours.
PR: ANNU 260. Applied feeding practices, nutrient requirements and ration formulation for poultry, swine, laboratory and companion animals. (2 hr. lec., 1 hr. lab.).

ANNU 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ANNU 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ANNU 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANNU 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANNU 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANNU 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ANNU 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ANNU 497. Research. 1-6 Hours.
Independent research projects.

ANNU 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ANPH 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANPH 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANPH 301. Introduction to Animal Physiology. 3 Hours.
PR: BIOL 102 or consent. The function and regulation of the principal systems of the animal body.

ANPH 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANPH 400. Growth and Lactation Physiology. 3 Hours.
PR: ANPH 301 or consent. Animal life cycles; nature of growth and lactation; effects of biological, environmental, and social-psychological variants; physiological regulation and control.

ANPH 405L. Animal Physiology Laboratory. 2 Hours.
PR: ANPH 301 or consent. Laboratory study of the physiological systems of animals and the influences of environment on these systems.

ANPH 424. Physiology of Reproduction. 3 Hours.
PR: Course in biology. Comparative physiology of reproduction in higher animals; endocrine functions involved in reproduction; genetic and environmental variations in fertility mechanisms.

ANPH 424L. Reproductive Laboratory. 1 Hour.
PR or CONC: ANPH 424 and junior standing or consent. Laboratory study of the anatomy and function of the reproductive physiology system in animals.

ANPH 426. Applied Animal Reproduction. 1 Hour.
PR or CONC: ANPH 424 and junior standing or consent. Laboratory study, including rectal pregnancy examination, of reproductive physiology system in animals.

ANPH 430. Breeding of Farm Animals. 3 Hours.
PR: Course in genetics or consent. Application of principles of quantitative genetics to the improvement of farm animals.

ANPH 440. Equine Exercise Physiology. 3 Hours.
PR: A&VS 281 and ANPH 301. Evaluation of research in equine exercise science; physiological and mental adaptation to training; performance nutrition; unsoundness during training and competition; management and training regimes.

ANPH 480. Behavioral Patterns of Animals. 3 Hours.
Examination of the bases for exhibition and control of behavioral patterns of domesticated and nondomesticated species. (2 hr. lec., 3 hr. lab.).

ANPH 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ANPH 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ANPH 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANPH 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANPH 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANPH 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ANPH 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ANPH 497. Research. 1-6 Hours.
Independent research projects.

ANPH 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ANPR 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANPR 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ANPR 308. Animal Production Experience. 1-4 Hours.
Experience in operating a dairy or livestock farm, including layers or broilers, calving, lambing, or farrowing of hogs. (Can be repeated up to a maximum of 4 credits. 3 hr. lab./ per hr. of credit.).

ANPR 336. Dairy Cattle History and Selection. 3 Hours.
To familiarize the student with the breeds of dairy cattle as well as modern concepts in phenotype and performance record evaluation. (2 labs.).

ANPR 338L. Horse/Livestock/Poultry Evaluation Laboratory. 3 Hours.
Appraisal of horses, cattle, sheep, poultry, and swine. Evaluation of scientific techniques used in selecting those species. Tours of representative flocks, herds and stables will be required.

ANPR 339L. Advanced Evaluation of Animal Products Laboratory. 1-4 Hours.
PR: ANPR 336 or ANPR 338 or ANPR 338L or consent. Advanced selection, evaluation and grading of domestic livestock species and animal products. Tours of representative flocks, herds and processing plants will be required. (Can be repeated up to a maximum of 4 credits.).

ANPR 341. Beef Production. 3 Hours.
PR: ANNU 260. Applying the principles of breeding, nutrition, physiology, and economics for the production of beef cattle.

ANPR 341L. Beef Production Laboratory. 1 Hour.
PR or CONC: ANPR 341. Experiences in beef cattle management, including feeding, handling, health programs and farm visits.

ANPR 344L. Advanced Horse Management Laboratory. 4 Hours.
PR: A&VS 281. Application of scientific principles and concepts in genetics, breeding, nutrition, reproduction, and anatomy to efficient production and management of horses.

ANPR 350. Milk Production. 3 Hours.
PR: Corequisite of ANPR 350L. This is a course on dairy cattle management. Topics will include an introduction to the US dairy industry, dairy breeds, nutrition and feeding, genetics and breeding, reproduction, raising of replacement animals, dairy facilities, mammary gland anatomy and milk quality, herd health, and general management of the dairy herd.

ANPR 350L. Milk Production Laboratory. 0 Hours.
Coreq: ANPR 350. Milk Production - ANPR 350 Laboratory.

ANPR 353. Pork Production. 3 Hours.
PR: ANNU 260. Physiological and economical bases of pork production. (2 hr. lec., 3 hr. lab.).

ANPR 356. Small Ruminants. 3 Hours.
PR: ANNU 260. Genetics, nutrition, physiology, health and management of small ruminants in production of fiber, meat and milk, in local, regional and global contexts.

ANPR 356L. Small Ruminants Laboratory. 0 Hours.
Coreq: ANPR 356. Small Ruminants - ANPR 356 Laboratory.

ANPR 367. Poultry Production. 3 Hours.
PR: ANNU 260. Special phases of broiler and egg production, disease control, labor-saving studies, and recent designs in housing and equipment for all types of poultry.

ANPR 367L. Poultry Production Laboratory. 1 Hour.
PR or CONC: ANPR 367. Laboratory study of poultry production systems, related feed manufacturing and product processing practices.

ANPR 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANPR 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ANPR 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ANPR 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ANPR 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANPR 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ANPR 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ANPR 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ANPR 497. Research. 1-6 Hours.
Independent research projects.

ANPR 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ANTH 105. Introduction to Anthropology. 3 Hours.
Essentials of human evolution and prehistory with a concentration on the varieties of languages and cultures found among peoples of the world.

ANTH 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

ANTH 252. Biological Anthropology. 3 Hours.
Overview of human genetics, human diversity, human osteology, primate studies, and fossil evidence for human evolution.

ANTH 254. Cultural Anthropology. 3 Hours.
Introduction to the history, methods, and current directions of cultural anthropology. Focus on living cultures across the world, encompassing the whole range of human activities. Consideration of identity, economy, politics, kinship, meaning, language, and inequality.

ANTH 258. Introduction to Archaeology. 3 Hours.
Comprehensive introduction to the field of archaeology. Course investigates the methods and theories used by archaeologists to understand culture change through time, and the reconstruction of the past through material culture analysis.

ANTH 259. The Craft of Anthropology. 3 Hours.
Orientation to the anthropological discipline. Focus on disciplinary ethics and building anthropological reading, writing, and research skills.

ANTH 349. Human Osteology. 3 Hours.
Introduction to the anthropological study of the human skeletal system. Emphasis on the methods for identifying human remains (including identification of complete bones and important skeletal markers) and methods used to conduct a biological profile for an individual (including determination of age, sex, ancestry, and pathology/trauma estimation).

ANTH 350. Latin American Culture. 3 Hours.
Ethnographic analyses of the peoples, culture, history, and politics of Latin America, and its relation to the global processes. Consideration of popular cultures, political violence and impacts of colonialism, neocolonialism and globalization.

ANTH 351. Anthropology of Appalachia. 3 Hours.
Ethnographic analyses of the peoples, cultures, histories, and politics of Appalachia. Course explores Appalachian traditions and customs, regional and cultural identities and identity formation, the cultural construction of Appalachia, and localized experiences of inequality, diversity, oppression, and resistance.

ANTH 352. Historical Archaeology. 3 Hours.
Archaeology of European colonization and post-colonial material culture in North America since 1492. Course examines analytical techniques including documentary research, artifact analysis and field excavation while scrutinizing archeological interpretation and its connections to present constituencies.

ANTH 354. Mesoamerican Archaeology. 3 Hours.
Overview of the diverse environments, social organizations, and lives of people in prehispanic cultures; from early food foragers through the Olmec, Maya, Teotihuacan, Zapotec, and Aztec. Explores how we understand and apply the Mesoamerican past.

ANTH 355. Cultural Resource Management. 3 Hours.
Overview and evaluation of government-sponsored preservation and study of archaeological and historical resources in the U.S., emphasizing West Virginia. Considers attitudes/relationships between participants including descendant communities, looters, public and private sectors.

ANTH 356. Ethnographic Field Methods. 1-6 Hours.
PR: Consent. (May be repeated for a maximum of 6 credit hours.) The distinctive craft of data gathering in cultural anthropology. Development of skills in field methods and participant observation.

ANTH 357. Archaeological Field School. 1-6 Hours.
Practical experience with the recovery and scientific study of archaeological remains. Emphasizes site survey, excavation, and laboratory techniques. (May be repeated for a maximum of six credit hours if different field schools.).

ANTH 358. Anthropology of Health and Illness. 3 Hours.
Health and disease, diagnosis, and healing in cross-cultural perspective; analyses of social, cultural, political, and economic factors in modern and traditional medical systems.

ANTH 359. Anthropological Thought. 3 Hours.
Analyzes and critiques anthropology as a discipline through humanistic and scientific approaches drawn from archaeological, biological, linguistic, and cultural perspectives. Examines social and intellectual history, principal theories, methods, practices, and ethical questions at an advanced undergraduate level.

ANTH 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANTH 450. Archaeology of Ancient States. 3 Hours.
Using case studies such as ancient Sumer, Egypt, Indus, China, Mesoamerica, the Andes, and North America, this course surveys the theories and debunks the myths surrounding the emergence (and collapse) of cities and complex societies.

ANTH 451. Material Culture. 3 Hours.
Examines physical aspects of culture, including human-made and natural objects and spaces. Applies an interdisciplinary perspective that is rooted in archaeology and cultural anthropology and draws on a number of methodological and theoretical approaches.

ANTH 457. Social Movements. 3 Hours.
Ethnographic approaches to the study of power, politics, and social change in the contemporary world. Focuses on past and present injustices, why ordinary people mobilize politically for change, and how to study these movements.

ANTH 458. Environmental Anthropology. 3 Hours.
Critical ethnographic analysis of environmental problems, activism, and potential solutions, including issues related to biodiversity conservation, sustainability, natural disasters, industrial contamination, environmental knowledge, risk perception, and nature/culture dynamics among Western and non-Western peoples.

ANTH 488. The Capstone Experience. 3 Hours.
PR: ANTH 359. Senior capstone seminar in which students articulate how anthropologists come to an understanding of the social world and the human condition, and the significance of that knowledge. Students conduct in-depth research projects under the guidance of the course instructor, oriented to course-specific substantive emphases and ways of engaging with theory and evidence.

ANTH 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ANTH 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ANTH 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ANTH 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ANTH 497. Research. 1-6 Hours.
Independent research projects.

ARBC 101. Elementary Modern Standard Arabic 1. 3 Hours.

ARBC 102. Elementary Modern Standard Arabic 2. 3 Hours.
PR: ARBC 101. Continuation of ARBC 101.

ARBC 203. Intermediate Modern Standard Arabic 1. 3 Hours.
PR: ARBC 102 or equiv. Continuation of ARBC 102.

ARBC 204. Intermediate Modern Standard Arabic 2. 3 Hours.
PR: ARBC 203 or consent. Continuation of ARBC 203.

ARBC 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ARBC 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ARBC 303. Arabic Conversation 1. 3 Hours.
PR: ARBC 203 or consent. Advanced communication course in Arabic. The course targets all language skills (speaking, listening, reading, and writing) with a major focus on developing communication skills in Arabic to handle a variety of social situations.

ARBC 304. Arabic Conversation 2. 3 Hours.
PR: ARBC 204. A lecture and discussion course designed to build communicative abilities and conversational fluency in Arabic at the intermediate-advanced level. Particular emphasis on writing descriptive and narrative short essays, reading and discussing authentic texts, and presenting information about a variety of topics in Arabic.

ARBC 305. Advanced Arabic Structure. 3 Hours.
PR: ARBC 204. A lecture and discussion course designed to develop communicative abilities in Arabic at the intermediate-advanced level. Particular emphasis on reading authentic texts and reviewing Arabic structures; integrating grammar and vocabulary practices; and reading, discussing, and writing short essays about a variety of texts that tackle social and cultural issues related to the Arab world.

ARBC 306. Readings in Arabic. 3 Hours.
PR: ARBC 204. A lecture and discussion course designed to develop knowledge of Arabic structures and vocabulary practices through reading, writing, and translating linguistically relevant authentic texts from Arabic media resources and Al-Kitaab at the intermediate-advanced level in Modern Standard Arabic.

ARBC 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ARBC 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ARBC 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ARBC 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ARBC 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ARBC 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ARBC 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ARBC 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ARBC 497. Research. 1-6 Hours.
Independent research projects.

ARBC 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ARE 110. Agribusiness Accounting. 3 Hours.
Introduction to accounting for agricultural, rural, and small business managers. Emphasis on the accounting cycle, analysis and interpretation of financial statements, income taxes, and managerial accounting. (Students having prior college credit in accounting are not eligible for this course.).

ARE 150. Introductory Agricultural and Agribusiness Economics. 3 Hours.
Introduction to basic agricultural economics and agribusiness concepts, and the application of these concepts to agricultural and agribusinesses issues.

ARE 187. Energy Resource Economics. 3 Hours.
Dilemmas posed for developing and modern societies by rising energy demands amid concerns for the world's environment. Economics of fuel sources and technologies, and historical and new concerns over resource scarcities.

ARE 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

ARE 199. Orientation to Agriculture and Resource Economics. 1,2 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities and opportunities.

ARE 201. Principles of Resource and Energy. 3 Hours.
PR: Third-year standing. Analyzes problems important or peculiar to mineral industry economics; exhaustion, externalities, risks, production cycle, industry structure, pricing, role of minerals in development and trade, resource planning. Energy, metals, industrial minerals. (3 hr. lec.).

ARE 204. Agribusiness Management. 3 Hours.
Overview of the agribusiness decision-making process, and the functions of agribusiness management; analysis of financial statements and budgeting for evaluating profitability of alternative enterprises and practices.

ARE 220. Introductory Environmental and Resource Economics. 3 Hours.
Economic analysis of environmental pollution, natural resource conservation and management, outdoor recreation, public land use, wildlife resources, water use, property rights, and benefit-cost issues.

ARE 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ARE 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ARE 360. Current Issues In Agriculture. 3 Hours.
Course focusing on the current scientific, ethical, legal, economic and political issues relating to agriculture. Students conduct group and individual research, discuss topics in an informal debate format and summarize positions in a written form.

ARE 380. Agribusiness Sales and Management. 3 Hours.
This course is designed to provide students with essential spreadsheet and sales skills they can apply regardless of their chosen profession. The course will cover spreadsheet basics and students will apply that knowledge to problems related to agricultural and resource economics.

ARE 382. Agricultural and Natural Resources Law. 3 Hours.
Introduction to legal concepts, principles and practices related to environmental, natural resource, and agricultural issues; in the context of the legal system within which statues are enacted, administered and enforced.

ARE 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ARE 401. Applied Demand Analysis. 3 Hours.
Consumer demand economics applied to environmental, natural resource, and agricultural issues; analysis of factors that influence demand and determine prices; special applications to non-market, environmental, and natural resource amenities.

ARE 406. Applied Quantitative Methods. 3 Hours.
PR: ARE 150. Application of basic quantitative concepts and methods applied to agribusiness and natural resources. Topics include applied economics, statistics, mathematics, and financial concepts and decision-making tools for determining optimum allocation of resources for production processes.

ARE 410. Environmental and Resource Economics. 3 Hours.
PR: ARE 220. Economic analysis of natural resource and environmental problems; management of renewable and non-renewable resources and environmental amenities; market failure, externalities, benefit-cost and risk analysis; property rights and the taking issues.

ARE 411. Rural Economic Development. 3 Hours.
Economic trends, development policies, and analysis of rural economies in the United States. Rural diversity, development concepts, rural planning, public programs and policies, and community analysis methods.

ARE 420. Adaptation and Mitigation Strategies for Addressing Climate Change. 3 Hours.
PR: Junior or Senior standing. This course identifies mechanisms that may be used to offset or reduce the effects of a changing climate. It addresses options that can help to protect agriculture and food production, protect human health, improve water resources and ecosystems services, and provide for the energy needed for continued economic activity. Students cannot receive credit for both ARE 420 and ARE 620.

ARE 422. New Venture Creation. 3 Hours.
In this course, students will learn the process of starting a new venture. The student will gain an in depth understanding of the framework and process by practicing the techniques on a startup of the student's choice.

ARE 431. Marketing Agricultural Products. 3 Hours.
Organization, functions, and analysis of the agricultural marketing system. Food consumption, exports, price analysis, marketing costs, market power, commodities futures market, food safety, and government regulations.

ARE 435. Marketing Livestock Products. 3 Hours.
Livestock marketing practices and policies. Supply and demand, livestock price cycles, grading, marketing alternatives, processing and retailing. Economic analysis of alternatives, current issues, and trends.

ARE 440. Futures Markets and Commodity Prices. 3 Hours.
Analysis of price-making forces which operate in the market place; emphasis on major agricultural and mineral commodity and futures markets.

ARE 445. Energy Economics. 3 Hours.
Analysis of the energy sector and its relationship to the rest of the economy; energy security, deregulation, full cost pricing, substitutability among energy sources, transmission, new technologies, environmental considerations.

ARE 450. Agriculture, Environmental and Resource Policy. 3 Hours.
PR: ARE 150 or ARE 220 or ECON 201 or consent. Economic analysis of agricultural, natural resource and environmental policies; problems of externalities and market failure, and alternative policies for addressing such problems; benefits and cost of alternative policies.

ARE 461. Agribusiness Finance. 3 Hours.
PR: ACCT 201 or ARE 110. An overview of financial analysis and the application of financial principles to small, rural and agricultural businesses. Includes applications of financial analysis computer software.

ARE 462. Records and Analysis for Sustainable Agribusinesses. 3 Hours.
PR: ARE 110 or ACCT 201 or BUSA 202. Managerial and record-keeping concepts and tools needed to run a successful agribusiness. Course materials and lab activities focus on collection and use of information to assist in whole-farm/agribusiness planning, decision-making, performance evaluation, sensitivity analysis, and management. Course stresses the impact of record-keeping and performance evaluation on the ability of an agribusiness to achieve its strategic goals.

ARE 482. Enterprise Operation Law. 3 Hours.
Course focusing on laws applicable to businesses and the management of risks associated with operating a business. Students will learn to read and interpret laws and apply them to real-life business scenarios.

ARE 484. Agribusiness Strategic Management. 3 Hours.
PR: Senior standing. This course is designed to enhance understanding of business strategy formulation and implementation. The course provides a balance between theoretical concepts, principles, and practice of agribusiness management. Case studies are used to illustrate the crafting, implementation, and execution of optimal strategies.

ARE 485. Economics of Water Resources and Energy. 3 Hours.
PR: Calculus with a grade of B- or better or consent, introductory micro economics with a C- or consent. Allocation under scarcity, water institutions and management, risk, pricing, marketing, demand and supply estimation, interdependence between energy and water resources (Credit cannot be received for both ARE 485 and ARE 585).

ARE 488. Career Development. 1 Hour.
PR: For Resource Economics and Management majors only. Development of career goals and job search skills. Investigation of topics that advance students in their career goals.

ARE 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ARE 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ARE 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ARE 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ARE 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ARE 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ARE 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ARE 497. Research. 1-6 Hours.
Independent research projects.

ARE 498. Honors. 1-3 Hours.
PR: Students in honors program and consent by the honors director. Independent reading, study or research.

ARHS 101. Landmarks of World Art. 3 Hours.
Introduction to the study of art history from prehistory to the present in which major landmarks of world art and architecture are considered as aesthetic objects, cultural documents and within their socio-historical contexts.

ARHS 111. World Architecture 1. 3 Hours.
Covers the built environment from cave shelter to Constantine's Rome. Includes architecture of ancient Mesopotamia, Egypt, Greece, Rome, Asia, Africa, and the Americas. Considers these periods' influence on modern structures.

ARHS 120. Survey of Art History 1. 3 Hours.
The course examines the history of the visual arts in world cultures from pre-historic periods to the fourteenth century.

ARHS 160. Survey of Art History 2. 3 Hours.
The course examines the history of the visual arts in world cultures from the fourteenth century to the present.

ARHS 225. GPS-Introduction to Italian Culture. 3 Hours.
Exploration of Italian history, culture, art, design, and language through lecture and experiential learning. Possible field trips: Florence, Rome, Pisa, Sienna, Lucca, Milan. Students conduct an individual design research project.

ARHS 240. Research, Writing, & Methods in Art History. 3 Hours.
PR: ARHS 120 and ARHS 160 with a minimum grade of C- in each and ((ENGL 101 and ENGL 102) or ENGL 103). This course cultivates critical research skills. It focuses on the close reading of texts and images, acquisition of effective research practices, writing within the discipline, and an introductory examination of the development and tradition of the literature of art theory and its relationship to artistic practice.

ARHS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ARHS 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ARHS 304. Asian Art. 3 Hours.

ARHS 307. Native American Visual Culture. 3 Hours.
In-depth overview of the visual material culture of the First Peoples of North America north of the Rio Grande, pre-contact to present. Focus on formal analysis with careful contextual studies.

ARHS 310. Introduction to Curatorial Practices. 3 Hours.
PR: ARHS 120 and ARHS 160. This course provides an introduction to museum structure and specifically the role of the curator. The objective is to assess exhibition display and develop critical perspective on curatorial practice.

ARHS 311. Museums and Society. 3 Hours.
PR: (ARHS 101 or ARHS 120 or ARHS 160) with a minimum grade of C- or instructor consent. This course introduces students to the theory and practice of museums, situating museums within a broader societal context. There is an emphasis on fine art museums in the twenty-first century. Topics include museum careers and professional roles within the museum; evolving philosophies of museum practice; museum ethics; and approaches to collecting displaying, and interpreting culturally significant art, objects, and artifacts.

ARHS 312. Museums in Action. 3 Hours.
PR: (ARHS 101 or ARHS 120 or ARHS 160) with a minimum grade of C- or instructor consent. Museums in Action explores the many ways in which museums connect with communities. Students will analyze current best practices for encouraging museum visitors to engage with, learn from and experience the objects they have on display. The course includes practical projects, where students will plan and implement components of museum outreach such as tours and public events.

ARHS 317. Gallery Studies. 3 Hours.
This course provides a hands-on approach to professional gallery management. Beginning with the practical considerations of daily operations, the course covers art handling, condition reports, packing and shipping artworks, installation, lighting, writing exhibition proposals, press releases, and reviews. Other coursework includes readings, written projects, and presentations on contemporary and historical gallery topics and issues.

ARHS 320. Greek and Roman. 3 Hours.
The arts of the Aegean World, c. 2000 BCE, Greece and Rome to 400 CE are examined. Architecture, sculpture and painting will be included.

ARHS 321. Ancient Greek Art and Architecture. 3 Hours.
PR: ARHS 120 with a minimum grade of C-. A study of Greek Art and Architecture, beginning with the Aegean world in the Third Millennium BCE and continuing through the Hellenistic period, up to about 31 BCE.

ARHS 325. Ancient Roman Art and Architecture. 3 Hours.
PR: ARHS 120 and ARHS 160. A study of a limited number of monuments in two-dimensional and three-dimensional mediums from the first millennium BCE through Imperial Rome.

ARHS 331. Medieval. 3 Hours.
PR: ARHS 120 and ARHS 160. The arts of Europe from c. 312 to c. 1350 are examined. The theoretical, historical, and literary contexts for the images will be established. Architecture, sculpture, painting and portable arts will be included.

ARHS 333. Medieval Architecture. 3 Hours.
The architecture of western Europe and its builders, from 313 through the sixteenth century: monumental buildings, architectural ornament, and the fusion of sacred and secular, in context of medieval world views.

ARHS 338. The History of Stained Glass. 3 Hours.
In-depth introduction to the study of architectural stained glass. Focus on the development of the medium, on formal analysis of composition, on conographical conventions, and historic contexts.

ARHS 345. Modern Art Theory. 3 Hours.
PR: ARHS 120 and ARHS 160 and 200-level art history. The course will examine the development of modern art theory and its relationship to artistic practice. Emphasis will be placed on the critical and theoretical examination of modernism and post modernism.

ARHS 348. Women in Art. 3 Hours.
The course examines the art of female artists and of women as subjects in art. There will be a historical view along with a strong theoretical component.

ARHS 350. Northern Renaissance. 3 Hours.
PR: ARHS 120 and ARHS 160. The arts of Northern Europe from 1350 to 1560 will be studied in a historical and theoretical context. Painting and sculpture will be the focus of study.

ARHS 354. Italian Renaissance. 3 Hours.
PR: ARHS 120 and ARHS 160. Early Renaissance through Mannerism. The course will emphasize both the historical context and theoretical foundation of 15th and 16th-century Italian art and architecture.

ARHS 360. Baroque. 3 Hours.
PR: ARHS 120 and ARHS 160. The course examines the art of the late 16th through 18th centuries of both Northern and Southern Europe. Issues of historical context and theoretical interpretation are emphasized.

ARHS 370. American. 3 Hours.
PR: ARHS 120 and ARHS 160. This course will treat the arts in the United States from the Colonial era to 1960. Emphasis is placed upon factors which define American art and the critical foundations for the works.

ARHS 375. Nineteenth Century. 3 Hours.
PR: ARHS 120 and ARHS 160. The course focuses upon European and American art from the late 18th century through 1900. Issues of theory, historical context and literary foundation will be considered.

ARHS 380. Modern. 3 Hours.
PR: ARHS 120 and ARHS 160. The revolutionary experience of modern art, from its foundation in 19th-century European movements through the 1950s will be emphasized. Critical theory and historical context stressed.

ARHS 381. Modern Architecture. 3 Hours.
PR: ARHS 120 and ARHS 160. In-depth overview of architecture, 1850 to present. Focus on development of International Style, its dissemination, and challenges to this modernist aesthetic by contemporary architects.

ARHS 382. GPS-Architect Frank Lloyd Wright. 3 Hours.
Overview of the life and work of America's most noted and controversial architect. Close examination of his work in the context of the development of modern architecture.

ARHS 385. Print, Propaganda, and Art. 3 Hours.
Survey of the history of printing, printmaking, and other forms of imaging in the western world from earliest printed materials to present. Theoretical implications of image reproduction also considered.

ARHS 388. The Art of Andy Warhol. 3 Hours.
Overview of the ground-breaking and controversial art of Andy Warhol. Close examination of his work in the context of the 1960's Pop Art movement and recent contemporary art.

ARHS 389. Contemporary. 3 Hours.
PR: ARHS 120 and ARHS 160. This course explores the various artistic movements from World War II to the present. Emphasis will be given to the change from modern to postmodern. Familiarity with images and critical texts is expected.

ARHS 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ARHS 401. Senior Project-Capstone. 1-15 Hours.
PR: Consent. This class concentrates upon independent research, closely supervised, on a topic of student's selection. This must be well-defined and contain historical, critical, and theoretical issues. (Contractual course.).

ARHS 402. History of Chinese Ceramics. 3 Hours.
Covers pre-history to present with emphasis on historical development of ceramics and cultures of important dynasties in Jingdezhen, China. Students will visit historical archaeological sites, traditional production centers and museums.

ARHS 405. Chinese Language and Culture History. 3 Hours.
Covers basic cultural and written Chinese, an introduction to China's many cultures and customs, and a brief history of China. (Field trips offer experiential learning at sites discussed in class.).

ARHS 406. Graphic Design History. 3 Hours.
PR: ARHS 120 and ARHS 160. This course presents graphic design as visual communication from prehistory to present, traced primarily through the poster. It also includes typography, styles, material culture, attending international political and art movements.

ARHS 411. Conservation Practices: Digital Documentation, Treatment, Condition Assessment. 3 Hours.
This course provides an introduction to the field of conservation and historic preservation. Topics include an overview of historical and current approaches to conservation treatment as well as contemporary issues associated with the field. Students learn fundamental skills in conservation examination (assessing the construction/condition of artworks/artifacts) and documentation (techniques will include stereomicroscopy, ultraviolet illumination, and digital documentation.).

ARHS 412. Collections Care and Preservation of Material Objects. 3 Hours.
This course introduces students to the preventive care of collections with a focus on museum policies regarding accessioning/de-accessioning of objects, exhibitions and loans, the transportation and handling of artworks and more. Students complete a survey of a collection, participate in a mock disaster recovery exercise, and conduct environmental monitoring for nearby collections/exhibition spaces.

ARHS 413. Material Objects Investigations 1 (2-D). 3 Hours.
Introduction to historical and contemporary materials of two-dimensional art (organic and inorganic), historical conservation treatments, and selected methods of technical examination of objects (microscopy, ultraviolet, infrared reflectography, x-ray). Printmaking, works of art on paper, papermaking, gilding, easel, and wall paintings will be covered. Students write technical reports, conduct research projects, and reconstruct historical artworks/artifacts.

ARHS 414. Material Objects Investigation 2 (3-D). 3 Hours.
Introduction to historical and contemporary materials of three-dimensional art (organic and inorganic), historical conservation treatments, and selected methods of technical examination of objects (microscopy, ultraviolet, infrared reflectography, x-ray). Metals, ceramics, stone, glass, resins, bone/ivory, basketry, textiles, and taxidermy will be covered. Students write technical reports, conduct research projects, and reconstruct historical artworks/artifacts.

ARHS 421. Professional Field Experience: Analysis of Archaeological Ceramics. 3 Hours.
PR: Corequisite of ARHS 422. Overview of traditional ceramic technology and its evolution. Examines materials and production methods used in the Mediterranean basin. Study historical typologies of architectural ceramics and pottery found in Italy, analyze archaeological artifacts from local excavations (6th c. BCE–20th c. CE), identify and sort sherds, perform typology analysis of “diagnostic” sherds, catalog and document sherds including analytical drawings and diagrams.

ARHS 422. Professional Field Experience: Restoration of Archaeological Ceramics. 3 Hours.
PR: Corequisite of ARHS 421. Theoretical knowledge and practical skills in the field of conservation of archaeological pottery. Students learn various methods of cleaning pottery sherds, the reassembly of pottery from surviving sherds, in-filling gaps left in the pottery after reassembly, the aesthetic treatment of the infilling for display and how to document the restoration procedure on pottery.

ARHS 445. Michelangelo and His Time. 3 Hours.

ARHS 446. Medieval Painting. 3 Hours.
An historical and media- centered investigation of the pictorial arts of the West c. 800-1300: manuscript illumination, mural painting, panel decoration, embroidery, mosaics, and stained glass.

ARHS 451. Professional Field Experience: Introduction to the History and Craft of Book Bindings. 3 Hours.
PR: Corequisite of ARHS 452. Through a lecture and workshop format, this course introduces students to the history and evolution of Western and Oriental bookmaking, from the handmade codex to pre-industrialized book-making processes. Students craft four traditional books and in the process learn the materials, tools, sewing structures and assembly process of the various elements.

ARHS 452. Professional Field Experience: Intro to Preservation and Preventive Conservation of Books. 3 Hours.
PR: Corequisite of ARHS 451. Theoretical overview of libraries and archives collection care, preventive conservation and book and archival material conservation with practical experience in non-invasive preventive conservation. Covers historical intrusive restoration compared to modern conservation treatments. Students assess and document structures, historical materials and conservation conditions of original items, through forms, photographs, drawings and implement non-intrusive conservative measures on original material in an archive.

ARHS 453. Professional Field Experience: Restoration of Traditional Masonry Buildings in Italy. 3 Hours.
PR: Corequisite of ARHS 454. Introduces students to restoration of natural and artificial stone surfaces in historic Italian buildings and structures. Through lectures and hands-on workshops, it explores traditional materials and techniques used to create buildings and artwork integral to their structure. It also examines the various agents of deterioration that, over time, damage the materials and the different approaches to their restoration and conservation.

ARHS 454. Professional Field Experience: Sketching and Analyzing Historic Buildings in Italy. 3 Hours.
PR: Corequisite of ARHS 453. This course develops intellectual skills in identifying and analyzing historic buildings and their cultural contexts. Building typologies, architectural styles, materials, structural systems, and construction methods are discussed. In the sketching workshop and onsite participants develop analytical skills through observational drawing and documentation.

ARHS 455. Professional Field Experience: Paper Media and Restoration Methods for Artworks. 3 Hours.
PR: Corequisite of ARHS 456. This theoretical course is an overview on restoration of paper media including the: nature and history of paper; traditional methods of paper making and printing; processes of deterioration; handling and mounting; methods of conservation and restoration of paper, and artworks on paper. Workshop includes practice on documents from the San Gemini Historic Archive and original ancient prints from private collection.

ARHS 456. Professional Field Experience:Handwritten & Printed Archival Materials Restoration Methods. 3 Hours.
PR: Corequisite of ARHS 455. Students gain hands-on experience the basic skills required for restoration of paper media and original archival materials. Students learn and apply basic conservation and restoration skills on original engravings and, having acquired sufficient skill, restore unique manuscript documents from the San Gemini Historic Archive and other Italian Archives (13th-19th centuries).

ARHS 457. Professional Field Experience:Traditional Painting Materials, Methods, &Restoration Issues. 3 Hours.
PR: Corequisite of ARHS 458 and ARHS 459. This course gives an in-depth understanding of traditional painting materials and techniques commonly used in Italy during the Middle Ages and the Renaissance. Since this course is aimed primarily at people planning to study art conservation, the course also explores factors that hasten deterioration of the materials and the different approaches to their conservation and restoration.

ARHS 458. Professional Field Experience: Traditional Painting Workshop. 3 Hours.
PR: Corequisite of ARHS 457 and ARHS 459. Covers traditional Italian painting materials and techniques (fresco, sgraffito, tempera on wood, gilding, oil on canvas) through hands-on experience using historical methods. No experience necessary; this is not an art class. The main objective is for students to learn the painting processes, difficulties, and limitations associated with each technique and material and how this influences aesthetics and the image-making process.

ARHS 459. Professional Field Experience: Restoration: Theory, Ethics, and Issues. 2 Hours.
PR: Corequisite of ARHS 457 and ARHS 458. This course examines the purpose and goals of preservation. Matters of philosophy, ethics, cultural values and “best practices” that influence the work of restorers are covered because misguided restoration work is a major cause of destruction or falsification of irreplaceable cultural heritage. This course teaches students to assess the goals and values that guide and influence restoration and conservation.

ARHS 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ARHS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ARHS 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ARHS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ARHS 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ARHS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ARHS 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ARHS 497. Research. 1-6 Hours.
Independent research projects.

ARHS 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ARHS 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

ART 102S. Non-Major Ceramics. 3 Hours.
The course is designed to teach basic ceramic skills associated with beginning pottery. Emphasis is on throwing techniques, trimming, handle attachment, basic ceramic design, glazing and studio practices.

ART 103. Materials and Procedures. 2,3 Hours.
Designed to guide elementary education majors in developing skills to teach visual arts within the PreK-8 classroom. Using age-appropriate 2-D and 3-D materials and resources students will pursue technical craftsmanship, employ elements and principles of design, and explore art concepts through a series of hands-on activities and projects. Learning relies on engagement with studio art production, lecture/demonstration, teaching labs, readings.

ART 109S. Basic Drawing 1 for Non-Majors. 3 Hours.
A beginning-level studio experience emphasizing the application of techniques and materials in rendering. Designed for non-art majors and those seeking to improve their portfolios to gain entrance into the BFA studio program.

ART 110S. Basic Drawing 2 for Non Majors. 3 Hours.
PR: ART 109 or ART 109S or consent. A studio experience building upon skills and techniques gained in ART 109S. Includes the examination of drawing through expanded materials. For non-art majors, those seeking to improve their portfolios and enter the BFA program.

ART 111S. Drawing 1. 3 Hours.
The course emphasizes fundamental principles of drawing with a focus on building basic skills through direct observation, using traditional graphic media and expression.

ART 112S. Drawing 2. 3 Hours.
The course emphasizes fundamental principles of drawing with a focus on more expressive approaches to basic problems. Greater emphasis is placed on abstraction and non-traditional drawing processes and media.

ART 121S. Visual Foundations 1. 3 Hours.
The course provides an introduction to the fundamental principles and concepts of two-dimensional image making with an emphasis on color theory and design. Through creative assignments students develop abilities and visual awareness emphasizing the basics of color perception, form, proportion and rhythm.

ART 122S. Visual Foundations 2. 3 Hours.
The course incorporates projects involving abstract and representational ideas in three dimensions and investigates the basic concepts of line, plane, volume, form, mass, texture, composition and time.

ART 191. First-Year Seminar. 3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

ART 211S. Figure Drawing. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 121 or ART 121S). This class concentrates on compositional structure from the human figure. Students will investigate organic nature of the figure and its representation in space using a wide variety of media and processes. (May be repeated for credit.).

ART 212S. Visual Foundations 3. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 121 or ART 121S) and (ART 122 or ART 122S). This class expands media possibilities and examines the variables of image-making while establishing personal expression. The course is designed to develop analytical and problem solving skills as well as technical processes.

ART 213S. Painting 1. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 121 or ART 121S). The course serves as an introduction to painting with concentration on structure, techniques and imagery. Emphasis is on the development of skills in rendering works which express light, color and form integral to the medium.

ART 214S. Painting 2. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 121 or ART 121S). The course provides the essential structure, techniques and iconography of painting. Its modern development, augmenting the traditional languages of painting, are clarified and isolated.

ART 217. Arts and Cultural Organizations. 3 Hours.
An introduction to the types of non-profit arts and cultural organization and the field of arts administration. Coursework will focus on issues related to the performing and visual arts in the non-profit sector.

ART 218. Introduction to Italian Art and Design Practice. 3 Hours.
Exploration of contemporary Italian art and design practice through studio instruction and/or experiential learning.

ART 223S. Introduction to Graphic Design. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 121 or ART 121S). The course emphasizes the application of traditional and technological skills emphasizing color, composition, symbolic drawing, and typography fundamental to the field of graphic design.

ART 224S. Graphic Design 2. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 121 or ART 121S) and (ART 122 or ART 122S). This course emphasizes typography, sequential projects and complex compositions, and includes preparation as well as review of upper-level entrance portfolios.

ART 226S. Introduction to Sculpture. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 121 or ART 121S). The course focuses on creative expression using basic traditional materials and techniques. Students explore aesthetics and contemporary issues while acquiring a working knowledge of various sculptural media.

ART 227S. Sculpture. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 121 or ART 121S). New construction techniques including stretched canvas over wood encaustics, molds, plasticene, and figure modeling will aid the students in developing problem-solving skills related to aesthetics and formal sculptural issues.

ART 230S. Printmaking - Intaglio and Relief. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 121 or ART 121S). This course is a fundamental printmaking class concerned with creating an understanding and sensitivity towards intaglio processes and techniques. Students explore and develop visual ideas and images using non-traditional approaches.

ART 231S. Printmaking - Lithography. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 121 or ART 121S). This course is an introduction to the fundamental processes of lithography with a focus on developing imagery and technical proficiency. Students acquire a working knowledge of the medium while examining aesthetics, contemporary discourse, and history as an art form.

ART 232S. Photography 1. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 121 or ART 121S). This course introduces the fundamentals of contemporary photographic practice and explores the medium in a “fine art” context. Students will learn to manually operate a camera, establish workflows for organizing and editing photographs, and practice basic lighting techniques. Technical skills serve as a foundation for exploring artistic uses of photography and the role of the medium in society more broadly.

ART 234S. Photography 2. 3 Hours.
PR: ART 232 or ART 232S. This course is a continuation of Photography 1; students will delve further into digital workflows and advanced lighting techniques and learn how to produce inkjet prints of their work. Likewise, students will be introduced to more challenging artistic concepts that will broaden their understanding of the medium’s complicated relationship to reality and our perception of it.

ART 235S. Introduction to Silkscreen. 3 Hours.
Printmaking class concerned with creating an understanding and sensitivity towards silkscreen processes, techniques, and developing ideas and images using multiple approaches. Students acquire knowledge of silkscreen, examine its aesthetics, discourse, and history.

ART 236. Mobile Digital Photography. 3 Hours.
Explores photography basics using a mobile device and digital applications. Emphasis will be on the design elements of photography, postproduction processes, application of mobile tools, and concept development. Construction of photographic narratives through control of exposure, shaping of light, sequence, and text integration will be addressed in the course project.

ART 237S. Introduction to Relief Printmaking. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 121 or ART 121S). This course introduces the fundamentals of relief printmaking and explores the medium in a fine art context. Students will learn the proper care and use of relief printmaking tools, materials, inks and chemicals. Technical skills serve as a foundation for exploring artistic uses of relief printmaking and the role of the medium in society more broadly.

ART 240S. Ceramics. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 122 or ART 122S). The course covers basic ceramic techniques including throwing, trimming, ceramic design, glazing, firing and studio practices. Lectures cover basic ceramic material, information and studio procedures.

ART 241S. Ceramics. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 122 or ART 122S). The course continues the study of basic ceramic techniques: throwing, trimming, ceramic design glazing, firing and studio practices. Lectures cover basic ceramic material, information and studio procedures.

ART 242S. Life Modeling. 3 Hours.
PR: (ART 111 or ART 111S) and (ART 112 or ART 112S) and (ART 121 or ART 121S) and (ART 122 or ART 122S). Explores entry-level figure modeling including basic bust and small-scale figure modeling. Covers techniques of clay building from armature to plaster or wax castings.

ART 264. Introduction to Art Education. 3 Hours.
PR: ART 111 and ART 112 and ART 121 and 122 and six hours of studio. Contemporary art education and resources that support its practices. Students also interact with experienced K-12 art specialists and their various grade levels.

ART 270S. Introduction to Electronic Media 1. 3 Hours.
PR: (ART 112 or ART 112S) and (ART 121 or ART 121S) and (ART 122 or ART 122S). Class provides introduction to fundamentals of digital media. Explores digital photography, animation multimedia. Covers use of various software, focuses on sound, technical foundation and esthetic proficiency in these media.

ART 271S. Introduction to Electronic Media 2. 3 Hours.
PR: ART 270 or ART 270S. A continued exploration into applications and aesthetics of digital media. Attention is given to historical and contemporary critical contest for this media. Students encouraged to create hybrids between media and digital approaches.

ART 272S. Designing for Multimedia. 3 Hours.
This course explores 2D and 4D visual design in a digital media context. Students learn the foundations of visual design including composition, hierarchy, unity and color theory. These concepts are explored through digital media tools.

ART 273S. Beginning 3D Animation. 3 Hours.
Introduction to 3D computer modeling and animation. Fundamental concepts and techniques of polygonal modeling, shading, texturing, lighting, animating and rendering. Character design and bipedal animation. The course culminates with the production of an original, character-based group animation.

ART 280. Studio Art for Art Historians. 3 Hours.
PR: ARHS 120 and ARHS 160. Experiential investigation of art studio practice; guest artist demonstrations. Emphasis on understanding materials, terminology, and artistic processes. May be repeated for credit.

ART 285S. Interactive Audio Design. 3 Hours.
PR: (ART 121 or ART 121S) and (ART 122 or ART 122S) with a minimum grade of C- in each and must be enrolled in the Interactive Design for Media major or minor. Covers core principles of audio design and control in an interactive environment. Students will learn about sound creation and propagation, audio recording and editing, the structure and emotional effect of music, and the function and application of sound effects to augment interactive experiences.

ART 286S. Layout for Digital Media. 3 Hours.
PR: ART 121S. This course focuses on layout and composition for screen-based digital media. During this course, you will learn to use Adobe Illustrator to create vector graphics, use color theory to create color palettes that meet accessibility standards, analyze and manipulate type, use grid systems, and visualize data.

ART 287. Coding for Media Applications. 3 Hours.
Introduces the principles and best practices of code development for visual interactive applications. The course covers the basics of interactive and programming code structures by introducing students to a variety of markup and interactive coding languages. Students will gain confidence with working with code through skill and knowledge based hands-on lessons and assignments.

ART 288S. Introduction to Game Engine Applications. 1 Hour.
PR: Restricted to declared majors in Game Design & Interactive Media or Journalism. This course teaches the fundamentals of creating interactive media using the Unity game engine and C# programming. Students will build several working prototypes by analyzing programming problems to identify and implement the necessary components.

ART 289S. Intermediate Game Engine Applications. 1 Hour.
PR: ART 288S with a minimum grade of C-. This course teaches intermediate techniques for creating interactive media using the Unity game engine and C# programming. Students will combine code, story text, art, and sound to build working prototypes in several game genres.

ART 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ART 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ART 313S. Painting 3. 1-15 Hours.
PR: (ART 213 or ART 213S) and (ART 214 or ART 214S). The course reaffirms and expands formal criteria established in ART 213S and ART 214S and directs individual research into personal, historical and contemporary painting issues in oil, acrylic and related media. (May be repeated for a maximum of 36 credit hours.).

ART 315. Arts Administration. 3 Hours.
This course provides a practical approach to understanding arts management in not- for-profit organizations. Topics include facilities management, leadership, programming, audience development, board relations, and fundraising.

ART 316. Arts Programming. 3 Hours.
PR: ART 217. The course examines principles and best practices related to comprehensive arts and cultural programming. Program theory, partnerships, program evaluation, volunteer coordination, marketing, and related topics will be explored.

ART 323S. Graphic Design 3. 12 Hours.
PR: ART 224 or ART 224S. Varied hypothetical projects give students a methodology for solving applied design projects in a range of formats. This class will deal with a combination of computer graphics, book arts, publication design and multi-media projects. Portfolio review. (May be repeated for credit.).

ART 324S. Graphic Design 4. 1-9 Hours.
PR: ART 323 or ART 323S. Senior graphic design studio includes a model studio with real projects, most of which are produced and printed. Emphasis is on developing professional skills in design and design management. (May be repeated for credit.).

ART 326S. Sculpture. 1-15 Hours.
PR: (ART 226 or ART 226S) and (ART 227 or ART 227S). Students continue to examine personal iconography as it pertains to aspects of contemporary sculpture. Topics explored are concept-oriented, using stone, concrete, glass, and emphasizing craftsmanship and aesthetic issues. (May be repeated for credit.).

ART 327S. Installation Art. 1-15 Hours.
PR: ART 122 or ART 122S. Students investigate this contemporary art form through a series of temporary, site-specific sculptural environments. Conventional art media and concepts are challenged as students develop alternative solutions to creative problems. (May be repeated for credit.).

ART 328S. Advanced Typography. 3 Hours.
PR: ART 224 or ART 224S. Students will study taxonomy, history and classification of typography as well as create projects in diverse formats such as posters, publications, exhibits or packaging to experience the typographic contexts and etiquette for each.

ART 330S. Printmaking. 1-15 Hours.
PR: (ART 230 or ART 230S) and (ART 231 or ART 231S). An exploration of color printmaking, advancing imagery through critical contexts. Students focus on technical mastery in lithography, intaglio, relief and alternative processes, expand their knowledge of printmaking's history and develop creative problem solving skills. (May be repeated for credit.).

ART 331. GPS-Jackson Hole Photography Workshop. 3 Hours.
Ten-day intensive photography field course that explores the diverse and remote region of northwestern Wyoming. Course includes daily excursions, darkroom and digital work sessions, gallery visits, and evening presentations.

ART 332S. Intermediate Photography. 3,6 Hours.
PR: (ART 232 or ART 232S) and (ART 234 or ART 234S). This course expands on the formal and critical criteria established in the introductory courses, and directs creative research into personal, historical, and contemporary issues. Students explore larger format cameras and advanced lighting techniques.

ART 333S. Alternative Photography. 3-6 Hours.
PR: (ART 232 or ART 232S) and (ART 234 or ART 234S). This course explores alternative photographic techniques and concepts that expand the definition of the medium. Techniques may include hand-applied emulsions, contemporary liquid emulsions, pinhole and plastic cameras, and digital negatives.

ART 335S. Advanced Photography. 6 Hours.
PR: (ART 332 or ART 332S) and (ART 333 or ART 333S). In this course emphasis will be on furthering explorations in the study of personal expression and development of creative style. Advanced camera, lighting and digital techniques are covered as needed.

ART 337S. Design for Web and Screen. 3 Hours.
PR: (ART 223 or ART 223S) and (ART 224 or ART 224S). Introduction to the technologies and methodologies utilized in graphic design for the web and other screen-based interfaces. This course focuses on an entire design process including information architecture, visual aesthetics and usability.

ART 340S. Ceramics. 1-15 Hours.
PR: (ART 240 or ART 240S) and (ART 241 or ART 241S). This intense studio concentration is designed to prepare students for graduate studies and/or professional studio practices. Historical and contemporary design issues, kiln design and building, firing, glaze and clay formulation, studio practices and advanced-level throwing and hand-building techniques will be studied. (May be repeated for credit.).

ART 341S. Ceramic Production Methods. 3 Hours.
PR: ART 240 or ART 240S or consent. This course expands the student's experiences in ceramics through the use of industrial techniques, production equipment and business tools for the development, production and marketing of ceramic products.

ART 342S. CAD and 3D Printing. 3 Hours.
This course is an introduction to Computer Aided Design (CAD) and 3D Printing for students with no prior experience in the subject. Students will learn how to use CAD software and imaging equipment to design 3D models and fabricate their prototypes and artwork using 3D printing, laser cutting, and other digital tools.

ART 365. Art Education Elementary. 3 Hours.
PR: ART 264 or ART 103 (if taken for 3 credit hours) with a minimum grade of C-. Emphasizes child-centered, visual culture arts education at the elementary level. Concentrates on choice-based arts curriculum development. Course content is based on WV, ISTE, and national core arts standards. Studio, lecture and discussion.

ART 366. Art Education: Secondary. 3 Hours.
PR: ART 264 with a minimum grade of C-. This course forms a foundation for using arts as an active process for learning at the secondary school level. The course offers experiential and theoretical tools for understanding creativity and critical thinking in arts education, beginning with students' development of their own skills and perspectives as creators/viewers of art. Lecture, studio practice.

ART 367. Technology Methods in Art Education. 3 Hours.
PR: ART 264. Examines multiple aspects of classroom technology in arts education. Combines hands-on computer techniques, critical analysis of digital art, and practical experience with curriculum design focusing on the integration and teaching of new and emerging technologies within K-12 school classrooms.

ART 370S. Intermediate Electronic Media. 3,6 Hours.
PR: (ART 270 or ART 270S) and (ART 271 or ART 271S). Students will expand explorations in video production from ART 271S and examine opportunities of creative works on the Internet. Building video skills and methodologies, students will create dynamic and artistic web pages.

ART 371S. Interactive Art. 3,6 Hours.
PR: (ART 270 or ART 270S) and (ART 271 or ART 271S). Students will utilize skills learned in previous electronic media courses to create projects incorporating a variety of knowledge and interactive software. Attention is given to historical and contemporary critical context.

ART 372S. Interactive Design. 3 Hours.
PR: ART 270 or ART 270S or ART 272 or ART 272S or VISJ 210. Interactive Design is a multimedia studio art course addressing core principles of interactivity, non-linear narration, and interaction design in art and culture.

ART 375. Space Atacama Chile. 4 Hours.
Space Atacama Chile is an adventure art course featuring a 10-day trip to the high-altitude Atacama Desert in Chile and Bolivia. Students learn basic animation and video techniques while investigating themes of space and perception in relation to the Chilean landscape. Students also learn about the history, politics and culture of Chile and the Atacama region.

ART 380. Art and Environment. 3 Hours.
PR: Must pass freshman review and complete 6 hours of 200-level coursework in area of emphasis or consent. Interdisciplinary studio/seminar course investigating art's relationship to the environment through readings, field trips, presentations and studio practice.

ART 382. Public Art. 3 Hours.
PR: ART 111S and ART 121S and ART 122S and 3 hours of 300-level coursework in focus area. This course introduces fundamental concepts and practices of public art. Students will research issues of site, time, and context to understand local, national, and global public art methodologies. This research will provide a foundation for students to create public art proposals and pursue collaborative activities in this creative discipline.

ART 386S. Gaming Design and Digital Narrative. 3 Hours.
This course covers an introduction to the principles and practice of game design as a tool for interactivity, database storytelling, and audience building within journalism. The course will analyze case studies and provide hands-on development and application of game mechanics and game dynamics within journalism and strategic media across web, mobile, tablet and emergent augmented reality platforms.

ART 387. UI/UX Design for Media Applications. 3 Hours.
PR: ART 262 with a minimum grade of C-. Introduces research and methods used in the field of User Experience design with an emphasis in digital media. Students learn to ideate, develop concepts, conduct user research and how to communicate user experiences to stakeholders.

ART 393. Special Topics. 1-3 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ART 410. Introduction to Visual Arts Therapy. 3 Hours.
PR: Course open to undergrads in art, counseling, psychology, education, or special education. Introduces students to basic principles and practices of visual arts therapy through historical background, theoretical frameworks, and in-field issues. Provides information on pioneers in the field, how and where art therapists practice, training required for the profession, as well as interactive art explorations to incorporate art therapy principles into their own teaching and/or artistic practice. Online lectures and discussion.

ART 411. Theory of Art Education & Art Therapy. 3 Hours.
PR: ART 410 and ART 412 with a minimum grade of C-, Course open to undergrads in art, counseling, psychology, education, or special education. Introduces students to the historical, theoretical and philosophical foundations of visual arts therapy. Provides students with an overall understanding of how visual arts therapy relates to practice in art education. Specific theories relating to creativity development and visual literacy are explored.

ART 412. Art Methods/Materials for Special Populations. 3 Hours.
PR: Course open to undergrads in art, counseling, psychology, education, or special education. Provides students with in-depth understanding of art methods and materials used in artistic development of children, adolescents and adults, while using creative process of art making to enhance the physical, mental and emotional well being of individuals of all ages. Research, assigned readings, online discussions, and hands-on projects and critiques. On-campus art-making seminar is required.

ART 413S. Senior Projects in Painting. 6 Hours.
PR: 18 hours of ART 313 or ART 313S. Advanced study directed toward completion of senior-level projects. Developed to meet individualized creative goals. The course culminates with participation in a senior student exhibition/other exit requirements.

ART 420. Advanced Problems in Art-Making. 3 Hours.
PR: ART 410 and ART 412 with a minimum grade of C- in each, Course open to undergrads in art, counseling, psychology, education, or special education. Provides students with in-depth understanding of art methods and materials used in artistic development of children, adolescents and adults, while using creative process of art making to enhance the physical, mental and emotional well being of individuals of all ages. Research, assigned readings, online discussions, and hands-on projects and critiques.

ART 422. Art Therapy Media & Materials. 3 Hours.
PR: ART 410 with a minimum grade of C-. Introduces undergraduate students to the fundamentals of art media and methods utilized in art therapy and therapeutic settings. Students explore a variety of 2D & 3D mediums through visual and divergent thinking strategies to understand how specific media in the creative process of art making can promote physical, mental, and emotional well-being of art therapy clients and patients.

ART 425S. Graphic Design: Senior Project. 3 Hours.
PR: ART 324 or ART 324S. This course is focused on the development of an undergraduate thesis in which each project is individually defined with an umbrella topic. Formats and content vary but each project culminates in a thesis exhibition and an individual audio/visual presentation. (May be repeated for credit.).

ART 426S. Senior Projects in Sculpture. 6 Hours.
PR: 18 hours of ART 326 or ART 326S or consent. Advanced study towards completion of senior-level projects, developed to meet individualized creative goals. The course culminates with participation in a senior student exhibition and other exit requirements.

ART 430S. Senior Projects in Printmaking. 6 Hours.
PR: 18 hours of ART 330 or ART 330S or consent. Advanced study directed toward completion of senior-level projects. Projects developed to meet individualized creative goals. The course culminates with participation in a senior student exhibition and other exit requirements.

ART 435S. Senior Projects in Photography. 6 Hours.
PR: (ART 234 or ART 234S) and (ART 335 or ART 335S). Advanced study directed toward completion of senior level projects, developed to meet individualized creative goals. The course culminates with participation in a senior student exhibition.

ART 440S. Senior Projects in Ceramics. 6 Hours.
PR: 18 hours of ART 340 or ART 340S or consent. Advanced study towards completion of senior-level projects, developed to meet individualized creative goals. The course culminates with participation in a senior student exhibition and other exit requirements.

ART 444. Promoting the Arts and Culture. 3 Hours.
Provides a framework for effective promotion of non-profit performing arts, visual arts and service organizations in the cultural arts industry. Identifies the tactical side of commercially advancing the arts including effective implementation of arts-field-specific promotional programs and initiatives. Develops an awareness of arts organizations in the current social, cultural, and commercial environments.

ART 445. Senior Capstone. 3 Hours.
Seminar culminating scholarly experience of the undergraduate art therapy program. Provides the opportunity to explore, research, and articulate individual perspectives on art-making and personal strengths related to future careers in art therapy. Includes lectures, guest speakers/visiting artists, reflective art-making and written assignments.

ART 470S. Senior Projects in Intermedia. 6 Hours.
PR: Consent. Advanced study towards completion of senior-level projects in intermedia. Projects are developed to meet individualized goals. The course culminates with participation in a senior student exhibition as well as other exit requirements.

ART 472S. Advanced Interactive Design. 3 Hours.
PR: (ART 272 or ART 272S) and (ART 372 or ART 372S) and JRL 225 with a minimum grade of C- in each. This course is a semester long, self-directed project focusing on specific interactive design applications in conjunction with advice and consultation from the instructor.

ART 485S. Experiments in Interactivity. 3 Hours.
PR: (ART 372 or ART 372S) and JRL 262 with a minimum grade of C- in each and students must be enrolled in the Interactive Design for Media minor or major. Addresses core principles of microcomputer programming, sensor interaction, and the Internet of Things to create site-specific interactive environments. Students will establish a critical awareness of computer-controlled environments through programming, circuit construction, and customized console design. Technologies explored include Raspberry Pi microcomputers, Arduinos, and 3D printing.

ART 486S. Intermediate Game Design. 3 Hours.
PR: (ART 287 or MDIA 262) and (MDIA 322 or MDIA 322S or ART 386S) with a minimum grade of C-. Key concepts that students explore are interactive and game design in three-dimensional spaces within both the physical computing and purely digital media. Students will establish a critical awareness of computer-controlled environments through programming, interactions development, game design, and game theory.

ART 487S. Advanced Game Design. 3 Hours.
PR: (ART 386S or MDIA 322 or MDIA 322S) and (ART 486S or MDIA 422 or MDIA 422S) with a minimum grade of C- in each or by instructor permission. This course focuses on preparing students to work within a large professional game development studio environment, similar to independent (indie) game studio companies.

ART 489. Residency 1. 4 Hours.
PR: (ART 264 and ART 365 and ART 366 and ART 367) with a minimum grade of C- in each. Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development as part of a yearlong student teaching residency. Full-semester, supervised experience in the K-12 art classroom setting and involves 250 hours devoted to student teaching.

ART 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ART 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ART 491B. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ART 491D. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ART 492. Directed Study. 1-3 Hours.
Directed study, reading and/or research.

ART 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ART 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ART 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ART 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ART 497. Research. 1-6 Hours.
Independent research projects.

ART 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ART 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding ro the content of the anchor course.

ASP 220. Introduction to Africana Studies. 3 Hours.
An interdisciplinary introduction to the histories, economics, cultural and artistic heritages, political and social experiences of Africans and African-Americans; focusing on the relationships between the two experiences.

ASP 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ASP 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ASP 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ASP 420. Seminar Africana Studies. 3 Hours.
PR: ASP 220. Focus on selected aspects of Africana experience. Required for completion of minor in Africana Studies.

ASP 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ASP 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ASP 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ASP 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ASP 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ASP 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ASP 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ASP 497. Research. 1-6 Hours.
Independent research projects.

ASP 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ASTR 106. Descriptive Astronomy. 3 Hours.
The celestial sphere, star time, solar time, Kepler's laws, H-R diagram and modern developments. No sophisticated mathematics used; only simple geometrical arguments employed.

ASTR 106L. Descriptive Astronomy Laboratory. 1 Hour.
PR or CONC: ASTR 106. Introduction to modern astronomical techniques and practices through research-quality astronomical data collection and analysis, computer simulation, and hands-on activities. Includes study of objects in our solar system, in the Milky Way, and located much farther away in the vast reaches of space. Students engage in authentic scientific practices while exploring the universe.

ASTR 110. Explosions in Space. 3 Hours.
PR: MATH 124 or higher, or appropriate score on MATH placement test. Topics covered include: special and general relativity, supernovae, neutron stars, black holes, wormholes, time travel and gamma-ray bursts.

ASTR 115. Honors Relativity. 1 Hour.
PR: MATH 124 or higher or appropriate score on MATH placement test. Exploration of gravity as the geometry of four-dimensional space time; the legacy of Einstein.

ASTR 250. Pulsar Search Collaboratory. 3 Hours.
PR: Consent. Online data analysis of Green Bank Telescope (GBT) data as part of the PSC effort to discover pulsars and will acquaint students with the scientific method, the power of information technology, and basic astronomical concepts. It is open to high-school students and work will be done largely remotely.

ASTR 290. Teaching Practicum. 1-3 Hours.

ASTR 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ASTR 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ASTR 368. Astrophysics 2. 3 Hours.
PR: ASTR 367. Continuation of ASTR 367. Physical principles are applied to the properties and evolution of the Milky Way and galaxies and to the structure and evolution of the solar system. Physical properties of the universe are examined.

ASTR 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ASTR 467. Stellar Structure and Evolution. 3 Hours.
Comprehensive discussion of birth, life cycle and end products of stars. Topics covered include main-sequence evolution, giant stars, white dwarfs, supernovae neutron stars and black holes.

ASTR 469. Observational Astronomy. 3 Hours.
PR: PHYS 314. Laboratory course consisting of three detailed projects which aim to acquaint students with current techniques for astronomy data analysis and interpretation across the electromagnetic spectrum.

ASTR 470. General Relativity. 3 Hours.
PR: PHYS 314 and PHYS 331. Innovative 'physics-first' introduction to Einstein's relativistic theory of gravity. Topics covered include special relativity, curved space time, spherical stars, gravitational collapse, black holes, gravitational waves and cosmology.

ASTR 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ASTR 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ASTR 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ASTR 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ASTR 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ASTR 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ASTR 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ASTR 497. Research. 1-6 Hours.
Independent research projects.

ASTR 498. Honors. 1-3 Hours.
PR: Students in honors program and consent by the honors director. Independent reading, study, or research.

AT 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ATTR 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ATTR 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ATTR 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ATTR 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ATTR 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ATTR 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ATTR 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ATTR 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

BCOR 121. Introduction to Business Applications. 2 Hours.
PR: Must be admitted into the Chambers College of Business and Economics. BCOR 121 is designed to teach students the fundamentals of business personal computer applications, including word processors, presentation tools, and spreadsheets, with a focus on using the tools for successful communication and data organization in a business setting.

BCOR 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

BCOR 199. Introduction to Business. 3 Hours.
This course introduces the student to the major business disciplines, basic business communications, and the University environment.

BCOR 200. Faculty-Led Study Abroad. 3 Hours.
PR: Consent. This course incorporates a study abroad program with an emphasis on examining the conduct of business in foreign countries. Students will obtain first-hand experience in communicating with business professionals, business school students, and other constituencies. (May be repeated for a maximum of 9 hours.).

BCOR 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BCOR 299. Business Communication. 3 Hours.
PR: WVU sections require (ENGL 101 or ENGL 1C1) or ENGL 103 each with a minimum grade of C-, PSC sections require ENGL 101 with a minimum grade of C- and WVUIT sections require (ENGL 101 and ENGL 102). This course is designed to prepare you to participate effectively in workplace communication. The curriculum reflects best practices in modern businesses and organizations, current and future demands in industry, as well as pedagogical approaches of higher education institutions. Throughout the semester, you will increase your familiarity with common business communication scenarios, audience, and corresponding verbal, written, and/or non-verbal messages.

BCOR 300. Principles of Real Estate. 3 Hours.
This course provides an overview of the legal, financial, economic and marketing concepts relating to real estate. Topics include property rights (contracts, deeds, mortgages, etc.); property ownership (titles, closing of settlement, insurance, taxes); financing (interest rates and mortgage types); brokerage; and property evaluation. This course has value to students who may wish to purchase, sell, or rent real estate.

BCOR 305. Real Estate Law. 3 Hours.
This course provides a comprehensive understanding of the legal principles and regulations governing the buying, selling, leasing, and development of real property. The course will be of interest to students contemplating careers in accounting, real estate development, real estate finance, city planning, or banking. Topics covered are contract law, property rights, land use regulations, zoning laws, financing, and environmental regulations.

BCOR 320. Legal Environment of Business. 3 Hours.
Explores the relationship of law, government and ethics to business enterprise. Provides overview of legal and ethical issues relevant to business decision-making and planning and the government regulations of business.

BCOR 330. Information Systems and Technology. 3 Hours.
Introduces essential information systems concepts for managing competitive firms in a global environment. Utilizes the Internet and builds skills in decision-making using spreadsheets, oral communication using presentation graphics, and data management using database software.

BCOR 340. Principles of Finance. 3 Hours.
Time Value of Money is applied to decision making in business and personal finance. Additionally, students learn common valuation techniques and financial planning.

BCOR 350. Principles of Marketing. 3 Hours.
Overview of marketing and the interrelationships between marketing and other business disciplines. Topics include the management of the product, communication, price, and distribution variables as well as introduction to buyer behavior and marketing research.

BCOR 360. Supply Chain Management. 3 Hours.
The course acquaints students with a variety of supply chain management key concepts, to include purchasing, logistics, competitiveness, location, inventory, forecasting, layout, production and operations management concepts and techniques.

BCOR 370. Principles of Management. 3 Hours.
This course will serve as an introduction to the process of managing and working effectively with people. The primary objective of this course is to provide students with an overview of the basic principles involved in effective management practices, including general and specific elements of planning, organizing, leading, and controlling.

BCOR 380. Business Ethics. 3 Hours.
This course first provides a comprehensive survey of the ethical issues challenging professional and corporate conduct in today's business world.

BCOR 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BCOR 460. Contemporary Business Strategy. 3 Hours.
PR: BCOR 320 and (BCOR 340 or FIN 325) and BCOR 350 and BCOR 360 and BCOR 370. The course focuses on the total organization and strategy development and execution that lead to the achievement of the organization's objectives and a superior position in the competitive environment in which it operates.

BCOR 490. Teaching Practicum. 1-3 Hours.

BCOR 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BCOR 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

BCOR 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

BIOC 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BIOC 452. Molecular Mechanisms of Metabolic Disorders. 3 Hours.
PR: BIOC 235 and (AGBI 410 or BIOC 339) with a minimum grade of C- in each. This course covers diseases resulting from disorders of human metabolism and the mechanistic basis behind the symptoms and etiology of those diseases. Molecular mechanisms behind both inherited and acquired metabolic defects leading to disease will be covered.

BIOC 492. Directed Study. 1-3 Hours.
Directed study, reading, and or research.

BIOC 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BIOC 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

BIOC 496. Senior Thesis. 1-3 Hours.
PR: Consent.

BIOC 497. Research. 1-6 Hours.
Independent research projects.

BIOC 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

BIOL 101. General Biology 1. 3 Hours.
Introductory course in biology: cellular, organismal, and population genetics, including reproduction, growth and development, and evolution.

BIOL 101L. General Biology 1 Laboratory. 1 Hour.
PR or CONC: BIOL 101. Experiments in biology: genetics and evolution; reproduction, growth, and development of cells, organisms, and populations.

BIOL 102. General Biology 2. 3 Hours.
Introductory biology: energetics and physiology of cells, organisms, and populations, including regulation and control of multicellular organisms.

BIOL 102L. General Biology 2 Laboratory. 1 Hour.
PR or CONC: BIOL 102. Experiments in biology: materials exchange, actions of enzymes, photosynthesis and respiration, and physiology of organisms.

BIOL 105. Environmental Biology. 3 Hours.
Population growth and human impacts on the environment, including ecosystem destruction, biological diversity, pollution, and global climate change are explored to obtain the concepts necessary to understand complex environmental issues of our time. (Intended for non-biology majors.).

BIOL 105L. Environmental Biology Laboratory. 1 Hour.
PR or CONC: BIOL 105. Field and laboratory exercises explore fundamental ecological concepts and environmental problems, such as biodiversity, pollution, and natural resource utilization.

BIOL 107. Biotechnology and Society. 3 Hours.
An overview of the use of biotechnology to solve agricultural, medical, and environmental problems. Bioethical concerns and societal impacts of the use of the technologies will be discussed.

BIOL 108. Drugs and the Body. 3 Hours.
An overview of how common prescription, street and over-the-counter drugs alter body functions. How the body absorbs and metabolizes various drugs, drug interactions, and the biology of addiction will also be presented.

BIOL 113. Inquiry and Reasoning for Biologists. 1 Hour.
PR or CONC: BIOL 115 or consent. Problem-based and team-based learning approach using topics from BIOL 115 to help students build foundational knowledge in biological principles as well as develop and practice critical thinking skills essential for success as a science major.

BIOL 115. Principles of Biology. 3 Hours.
PR or CONC: (BIOL 115L or BIOL 116 or BIOL 119L) with a minimum grade of C-. Presentation of basic principles of modern biology. First in a four-course, integrated sequence required of biology majors. Topics include ecology and evolution, organismal biology, and cellular/molecular biology.

BIOL 115L. Principles of Biology Laboratory. 1 Hour.
PR or CONC: BIOL 115 with a minimum grade of C-. Emphasizes proper understanding and use of the scientific method to design and perform biological experiments. Discipline-specific communication techniques, including scientific writing, also emphasized.

BIOL 117. Introductory Physiology. 3 Hours.
PR: ((BIOL 101 and BIOL 102 and (BIOL 101L or BIOL 103) and (BIOL 102L or BIOL 104)) or ((BIOL 115 and (BIOL 115L or BIOL 116 or BIOL 119L)) with a minimum grade of C- in all and PR or CONC: BIOL 117L or BIOL 118 or BIOL 120L. Continuation of BIOL 115. The diversity of reproductive, developmental, functional, and integrative mechanisms in plants and animals.

BIOL 117L. Introductory Physiology Laboratory. 1 Hour.
PR: ((BIOL 101 and BIOL 102 and (BIOL 101L or BIOL 103) and (BIOL 102L or BIOL 104)) or ((BIOL 115 and (BIOL 115L or BIOL 116)) and PR or CONC: BIOL 117. Continuation of BIOL 115 and 115L. Utilizes themes from plant and animal physiology to enhance students' skills when applying the scientific method. Emphasis is placed on experimental design and discipline-specific communication methods.

BIOL 119L. Foundations Inquiry Lab 1. 1 Hour.
PR or CONC: BIOL 115 with a minimum grade of C-. Course-based undergraduate research experiences for Biology majors First in a multi-course inquiry lab series for biologists.

BIOL 120L. Foundations Inquiry Lab 2. 1 Hour.
PR: BIOL 115 and (BIOL 115L or BIOL 119L) with a minimum grade of C- in each and PR or CONC: BIOL 117 with a minimum grade of C-. Course-based undergraduate research experience for Biology majors. Second in a multi-course inquiry lab series for biologists.

BIOL 122. Human Sexuality. 3 Hours.
A study of biological, behavioral and societal aspects of sexuality. Issues considered include changing fecundity, social-legal implications, sex roles, sexually transmitted diseases, populations, erotica, aging, dysfunctions, and decision- making skills for sex related issues.

BIOL 191. First-Year Seminar. 3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

BIOL 219. Cellular and Molecular Biology. 3 Hours.
PR: (BIOL 117 and (BIOL 117L or BIOL 118 or BIOL 120L or BIOL 240) and ((CHEM 115 and CHEM 115L) or (CHEM 111 and CHEM 111L and CHEM 112 and CHEM112L)) with a minimum grade of C- in all and PR or CONC: BIOL 219L or BIOL 220L or BIOL 222L. Third course in the core curriculum required for biology-related majors. Expands on topics from BIOL 115/117, especially with regard to cell chemistry, bioenergetics, cell physiology and gene expression.

BIOL 219L. Cellular & Molecular Biology Laboratory. 1 Hour.
PR: BIOL 117 and (BIOL 117L or BIOL 118 or BIOL 120L or BIOL 240) and ((CHEM 115 and CHEM 115L) or (CHEM 111 and CHEM 111L and CHEM 112 and CHEM 112L)) with a minimum grade of C- in all and PR or CONC: BIOL 219. BIOL 219L is the laboratory that accompanies BIOL 219 (Cellular & Molecular Biology).

BIOL 221. Ecology and Evolution. 3 Hours.
PR: BIOL 117 and (BIOL 117L or BIOL 118 or BIOL 120L) with a minimum grade of C- in all. Basic concepts in evolution and ecology including Darwin's theory of natural selection, modern population genetics, speciation, population growth and regulation, demography, community ecology, ecosystem dynamics, and human ecology.

BIOL 222L. Intermediate Inquiry Lab. 2 Hours.
PR: BIOL 117 and (BIOL 117L or BIOL 120L) with a minimum grade of C- in each and PR or CONC: BIOL 219. Course-based undergraduate research experience for Biology majors. Third in an integrated, multi-course lab series for biologists. Topics and experiments will vary by year.

BIOL 223. Quantitative Biology. 3 Hours.
PR: MATH 124 or higher. Practical skills to perform data analysis in the biological sciences and present the results. Theoretical foundations to understand the quantitative basis of the analysis procedures most commonly used in biology.

BIOL 235. Human Physiology. 3 Hours.
PR: WVU sections require (BIOL 101 and BIOL 101L and BIOL 102 and BIOL 102L) or BIOL 115, WVUIT sections require (BIOL 101 and BIOL 101L and BIOL 102 and BIOL 102L) or BIOL 111. (Intended for non-biology majors.) An introductory course in the function of the human.

BIOL 236. Human Physiology: Quantitative Laboratory. 1 Hour.
PR: MATH 156 and CHEM 116 and (BIOL 115 or (BIOL 101 and BIOL 102 and BIOL 103 and BIOL 104) or PR or CONC: BIOL 235). Optional lab for BIOL 235 incorporating engineering concepts, such as mass and energy balances, circuit theory, and chemical kinetics to quantify and help understand many aspects of human physiology.

BIOL 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BIOL 298. Honors. 1-3 Hours.
PR: Students in the Honors Program and consent by the honors director. Independent reading, study, or research.

BIOL 301. History of Biology. 3 Hours.
PR: (BIOL 101 and BIOL 103 and BIOL 102 and BIOL 104) or BIOL 115. History of development of biological knowledge with philosophical and social backgrounds.

BIOL 302. Biometry. 3 Hours.
PR: (BIOL 223 or STAT 211) with a minimum grade of C-. Application of quantitative methods and statistics to biological data with emphasis on hands-on hypothesis construction, experimental design, data analysis and biological interpretation of statistical results.

BIOL 310. Advanced Cellular/Molecular Biology. 3 Hours.
PR: BIOL 219 and (BIOL 219L or BIOL 220). Advanced study of molecular mechanisms underlying fundamental cellular processes.

BIOL 310L. Advanced Cellular/Molecular Biology Laboratory. 2 Hours.
PR or CONC: BIOL 310. Experimental approaches to the study of cellular systems.

BIOL 312. Introduction to Virology. 3 Hours.
PR: BIOL 219. Survey of viruses, their modes of replication and spread, and the medical and economic significance of viral diseases in public health.

BIOL 313. Molecular Basis of Cellular Growth. 3 Hours.
PR: BIOL 219. Study of the integration of internal and external influences as they regulate the division, growth, and differentiation of cells. Topics include hormones as cell effectors, cancer, and stem cells.

BIOL 315. Communicating Natural Science. 3 Hours.
PR: BIOL 219 or BIOL 221. Teaches students to effectively communicate about scientific discoveries and scientific issues in both written and oral forms to professional scientists, the public, the media and politicians. Students will learn to consider the knowledge, biases and goals of their intended audience to communicate thoughtfully and effectively.

BIOL 316. Developmental Biology. 3 Hours.
PR: BIOL 219 and (BIOL 219L or BIOL 220). A molecular genetic analysis of the mechanisms by which multicellular organisms develop from single cells.

BIOL 316L. Developmental Biology Laboratory. 1 Hour.
PR: BIOL 219 and (BIOL 219L or BIOL 220) and PR or CONC: BIOL 316. Experimental approaches to the genetic analysis of the mechanisms by which multicellular organisms develop from single cells.

BIOL 318. Writing Appalachian Ecology. 3 Hours.
This course encourages students to think about the long-term future of our planet. What could our world be like in 200 years? How will current environmental problems change the future? How will relationships with the natural world change? Students address questions like these in creative nonfiction essays they write about research being conducted at the Fernow Experimental Forest in WV.

BIOL 320. The Total Science Experience: Genomics. 3 Hours.
PR: BIOL 219. Biological research experience incorporating critical skills of being a research scientist, including writing grant proposals, manuscripts, and materials for presentation of results in a public forum. Students conceive, design, propose, execute, analyze, and report an experiment with a genomics focus. Fulfills the capstone requirement in Biology and provides a realistic exposure to joys and challenges of performing scientific research.

BIOL 321. Total Science Experience Lab. 3 Hours.
PR or CONC: BIOL 221. Biological research experience incorporating diverse learning experiences that take place in the process of being a research scientist; including writing grant proposals, manuscripts, and presentation of results in a public forum.

BIOL 323L. Advanced Inquiry Lab. 2 Hours.
PR: BIOL 221 or (BIOL 219 and (219L or 222L)) with a minimum grade of C- in each. Inquiry Labs are course-based undergraduate research experiences. This is the fourth in an integrated, multi-course series of labs for biologists.

BIOL 324. Molecular Genetics. 3 Hours.
PR: BIOL 219 and (BIOL 219L or BIOL 220). Theoretical and practical knowledge in genetics as a field of study and as an approach for investigating biological problems.

BIOL 324L. Molecular Genetics Laboratory. 1 Hour.
PR: BIOL 219 and (BIOL 219L or BIOL 220) and PR or CONC: BIOL 324. The laboratory is a logical sequence of experiments providing actual research experience in molecular genetics.

BIOL 327. Professional Development. 1 Hour.
PR: BIOL 219. This course provides an overview of opportunities for students graduating with degrees in the biological sciences. An assessment test will help identify strengths and weaknesses within the field.

BIOL 335. Cell Physiology. 3 Hours.
PR: BIOL 219. Emphasis on the unity and diversity of cells; membrane structure and function; and the role that intracellular compartments, cytoskeleton, and extracellular matrix play in cell physiology.

BIOL 338. Behavioral Ecology. 3 Hours.
PR: BIOL 112 or BIOL 221. Consideration of the influences of environmental factors on short-and long-term regulation, control, and evolution of the behavior of animals. Students on the Morgantown campus will be required to complete BIOL 221.

BIOL 339. Animal Communication & Behavior. 3 Hours.
PR: (BIOL 221 or BIOL 348) with a minimum grade of C-. Animal behavior includes solitary activities (finding food) and social interactions. Communication mediates most interactions between individuals, and the brain dedicates much of its resources to generating and processing these signals. This course will cover the main aspects of animal behavior, from solitary activities such as feeding to social activities such as cooperation.

BIOL 340. Invertebrate Zoology. 3 Hours.
PR: BIOL 221. The evolution of animals without vertebral columns.

BIOL 341. Ichthyology. 4 Hours.
PR: Corequisite of BIOL 341L. Study of the internal and external structure of fishes, their systematic and ecological relationships, and their distribution in time and space. (Dissection kit required.).

BIOL 341L. Ichthyology Laboratory. 0 Hours.
PR: Corequisite of BIOL 341. Ichthyology - BIOL 341 Laboratory.

BIOL 344. Advanced Human Physiology. 3 Hours.
PR: BIOL 219 and (BIOL 219L or BIOL 220) with a minimum grade of C- and PR or CONC: BIOL 344L. Explores the cellular and integrative features of the human body and its systems. We will cover topics from the level of the cell all the way through to the organ system and how these systems interact with one another. Designed for students interested in health professions and will have a heavy focus on health care.

BIOL 344L. Advanced Human Physiology Laboratory. 1 Hour.
PR: BIOL 219 and (BIOL 219L or BIOL 220) with a minimum grade of C- and PR or CONC: BIOL 344. Laboratory course that will focus on the detrimental and beneficial impact of psychological stress on human systems. Students will explore virtual manipulation of physiological systems at the cellular system, the intersection of social justice, psychological stress, and physiological experimentation, and will allow you to track your own stress and its impacts on your physiology by designing a semester long experiment.

BIOL 345. Human Anatomy. 3 Hours.
PR: BIOL 219 and (BIOL 219L or BIOL 220) and PR or CONC: (BIOL 345L or BIOL 346) with a minimum grade of C- in all. Study of human morphology, with a focus on anatomical function and medical applications. Lecture integrates integument, skeletal, muscular, cardiovascular, digestive, urogenital, respiratory, and nervous system anatomy. The co-requisite lab parallels these lecture topics. This course is intended for students interested in the human health fields.

BIOL 345L. Human Anatomy Laboratory. 2 Hours.
PR: BIOL 219 and (BIOL 219L or BIOL 220) and PR or CONC: BIOL 345 with a minimum grade of C- in all. This lab course meets twice a week and parallels the discussion of anatomy and function in BIOL 345 lecture. Students use microscopes to identify integument anatomy, examine human bones in order to name bones and relevant bone landmarks. Students collaborate with a partner to fully dissect a cat, sheep brain, pig heart and cow eye.

BIOL 348. Neuroscience 1. 3 Hours.
PR: WVU sections require BIOL 219 with a minimum grade of C-, WVUIT sections require BIOL 112. An introduction to neuroscience, including basic neuroanatomical neurophysiology, and the relationship between the central nervous system, physiology, and behavior.

BIOL 349. Neuroscience 2. 3 Hours.
PR: BIOL 348. An introductory systems level course on organization of the nervous system, from an evolutionary to a clinical perspective. Topics include development and functional organization of sensory, motor, autonomic and cognitive systems. The evolutionary history and human health concerns associated with these systems will be addressed, through lecture, discussion, and readings in the primary literature.

BIOL 350. Plant Physiology. 4 Hours.
PR: (BIOL 117 and (BIOL 117L or BIOL 118) and CHEM 116 and CHEM 116L) or (CHEM 112 and CHEM 112L and PLSC 206) and Coreq: BIOL 350L. Physiochemical processes of plants.

BIOL 350L. Plant Physiology Laboratory. 0 Hours.
PR: Corequisite of BIOL 350. Plant Physiology - BIOL 350 Laboratory.

BIOL 353L. Flora of West Virginia Laboratory. 3 Hours.
PR: (BIOL 101 and BIOL 101L and BIOL 102 or BIOL 102L) or (BIOL 115 and BIOL 115L) or GEOG 307. Identification of local woody and herbaceous seed plants, with emphasis on common native and introduced species. Conducted primarily through field trips to nearby areas with the use of dichotomous keys to determine the scientific names of observed specimens.

BIOL 355. Understanding Climate Change. 3 Hours.
Fundamental understanding of the causes, consequences, and challenges of human-caused climate change. Provides students with both intuitive and quantitative understanding of the topic through lectures, readings, videos, demonstrations, homework exercises, writing assignments, and computer simulation models.

BIOL 361. Plant Ecology. 4 Hours.
PR: BIOL 221 and Coreq: BIOL 361L. Introduction to the four divisions of plant ecology, including physiological ecology, population ecology, community ecology and ecosystem ecology.

BIOL 361L. Plant Ecology Laboratory. 0 Hours.
PR: Corequisite of BIOL 361. Plant Ecology - BIOL 361 Laboratory.

BIOL 363. Plant Geography. 3 Hours.
PR: BIOL 221. World-wide distribution patterns of plants and factors related to these distributions, including dispersal. Limiting factors, climate, isolation, evolutionary history, plate tectonics, pleistocene glaciations, and human activities. Plant communities and soils of polar, temperate, and tropical biomes are discussed.

BIOL 365. Conservation Biology. 3 Hours.
PR: BIOL 221 or WMAN 313 and Coreq: BIOL 365L. Review of literature, research, and application of topics including biodiversity, endangered species, population biology, extinction, invasive species, conservation, restoration, and sustainability.

BIOL 365L. Conservation Biology Laboratory. 0 Hours.
PR: Corequisite of BIOL 365. Conservation Biology - BIOL 365 Laboratory.

BIOL 376L. Research Methods Laboratory. 3 Hours.
PR or CONC: BIOL 221. Introduction to the tools and mathematics that scientists use to solve scientific problems. Mathematical modeling, experimental design, hypothesis formulation, data collection, use of statistics, reading and evaluating the scientific literature, writing and reviewing scientific papers, and oral presentation of scientific research.

BIOL 386. Undergraduate Research. 1-4 Hours.
Individual laboratory or field experiments supervised by a faculty member.

BIOL 387. Experimental Design & Communication 1. 1 Hour.
PR: BIOL 327 with a minimum grade of C-. The second course in a three-course series providing professional development to Biology majors. This course focuses on proposal writing, advanced experimental design, critiques of scientific literature/ideas, and professional communication to non-scientific audiences.

BIOL 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BIOL 409. Biochemical Basis of Therapeutics. 3 Hours.
PR: BIOL 219. This course explores the process of drug discovery and development. The topics emphasized include the biological factors that determine success, failure, or limitation of therapeutics. Other topics include, specific therapeutic areas and regulation.

BIOL 410. Cell and Molecular Biology Methods. 3 Hours.
PR: BIOL 219. Introduction to the theory, application, ethic and economics of biotechnologies.

BIOL 411L. Introduction to Recombinant DNA Laboratory. 4 Hours.
PR: BIOL 219 and (BIOL 219L or BIOL 220). Introduction to basic principles and techniques of recombinant DNA technology. Includes molecular cloning, isolation of plasmid DNA, agarose/acrylamide gel electrophoresis, restriction enzyme mapping, nucleic acid hybridization, and DNA sequencing.

BIOL 413. Molecular Endocrinology. 3 Hours.
PR: BIOL 219. Hormonal action is discussed at the cellular and molecular levels. Topics include hormone production and regulation, receptor kinetics and activation, and receptor output.

BIOL 415. Epigenetics. 3 Hours.
PR: BIOL 219 or consent. Explores the molecular mechanisms, phenotypic phenomena and current applications of epigenetics and the study of how genetic information is used and maintained.

BIOL 418. Medical Genetics. 3 Hours.
PR: BIOL 219. The use of genetic principles to uncover biological mechanisms of both inherited and infectious diseases. The role of the human genome. The evolution of genetic diseases and the impact on human populations. Genetic medicine and current medical treatments.

BIOL 420. Genomics. 3 Hours.
PR: BIOL 219. Advanced elective examining biology and evolution on a genome-wide scale. Topics include fields of study and methods of DNA sequence acquisition and annotation, including exploration of the human genome and its contribution to disease discovery.

BIOL 422. Current Topics in Genome Biology. 1 Hour.
PR: BIOL 219. Exploration of modern topics in genomics research through interactive discussion of current literature. Students learn approaches to critical evaluation of manuscripts while exploring current research in this rapidly growing field. The course is organized around student-led discussions of manuscripts selected by the class. Undergraduate students are paired with graduate students to facilitate interpretation of complex material.

BIOL 423. Biochemistry of Nucleic Acids and Proteins. 3 Hours.
PR: AGBI 410 or equivalent. Focuses on the biochemistry of proteins and nucleic acids, with an emphasis on application of advanced knowledge to contemporary problems in cell biology, neuroscience, and immunology. Develops critical thinking, predictive, and problem-solving abilities that prepare students for health-related professional/graduate schools and the biotech industry.

BIOL 423L. Biochemistry of Nucleic Acids and Proteins Laboratory. 2 Hours.
PR: AGBI 410 and PR or CONC: BIOL 423. Advanced biochemistry laboratory. Research and hypothesis design, manipulation of DNA and proteins, use of biochemical techniques to express protein and analyze function.

BIOL 424. Protein Structure and Function. 4 Hours.
PR: BIOL 219 and (CHEM 231 or CHEM 233). Explores fundamentals of the protein structure; methods of structure determination; features of globular, membrane, and fibrous proteins; and approaches to protein classification.

BIOL 425. Developmental Genetics. 3 Hours.
PR: BIOL 219. This course covers the mechanisms by which genetics instructs the process of development. The complex interactions between cells, the environment, and the genome are presented.

BIOL 426. Molecular Biology of Cancer. 3 Hours.
PR: BIOL 219. Exploration of molecular pathways leading to the development of cancer with emphasis on gene expression, cell cycle regulation, and signaling pathways targeted in conventional therapies.

BIOL 430. Bioinformatics. 3 Hours.
PR: BIOL 219 or Consent. An introduction to algorithms and tools for analysis of genetic and genomic data in an evolutionary context.

BIOL 436. Comparative Animal Physiology. 3 Hours.
PR: BIOL 219 with a minimum grade of C-. In-depth, current treatment of physiological principles which operate at various levels of biological organization in animals of diverse taxonomic relationships. Understanding is developed from background lectures and student analyses in discussion sessions of research literature.

BIOL 438. Animal Behavior. 3 Hours.
PR: BIOL 221. Introduction to animal behavior (ethology) emphasizing the ecology and evolution of individual and social behaviors. Laboratory includes independent investigation of behavioral phenomena. (Offered in even numbered years.).

BIOL 439. Neuroethology. 3 Hours.
PR: BIOL 348 with a minimum grade of C-. Explores the way sensory systems process information to mediate behavior in a wide variety of animals in order to understand similarities and differences in neural mechanisms.

BIOL 440. Comparative Anatomy. 4 Hours.
PR: WVU sections require BIOL 219 and BIOL 221 or consent, WVUIT sections require BIOL 112. A functional and evolutionary study of vertebrate structure. (Dissection kit required.).

BIOL 448. Plant-Microbial Interactions. 3 Hours.
PR: BIOL 221. An exploration of how dynamic linkages between plants and soil microbes shape biological function at the organismal, ecosystem, and global scales.

BIOL 450. Plant Systematics. 4 Hours.
PR: BIOL 117 and (BIOL 117L or BIOL 118) and Coreq: BIOL 450L. Study of the taxonomy of flowering plants worldwide and related topics in angiosperm classification and evolution. Laboratories emphasize characteristics of selected families of monocotyledons and dicotyledons using living and herbarium material.

BIOL 450L. Plant Systematics Laboratory. 0 Hours.
PR: Corequisite of BIOL 450. Plant Systematics - BIOL 450 Laboratory.

BIOL 453. Molecular Basis of Disease. 3 Hours.
PR: BIOL 219. Examine medical, ethical, and legal/regulatory issues emerging from the Human Genome Project and its applications to personalized medicine.

BIOL 454. Immunology. 3 Hours.
PR: WVU sections require BIOL 219, WVUIT sections require BIOL 111. Explores the fundamental principles and practices of immunology including how the immune system is organized, how it functions to keep us healthy, and how it can cause allergies and autoimmune disease.

BIOL 455. Evolution of Infectious Diseases. 3 Hours.
PR: BIOL 221. The application of phylogenetics, microbiology, immunology, and epidemiology towards understanding the evolution of infectious diseases. Students will develop a fundamental understanding of the significance of evolution and ecology in infectious disease emergence and control.

BIOL 456. Microbial Symbiosis. 3 Hours.
PR: BIOL 221. An understanding of the significance of microbial symbioses towards ecological and health processes will be developed. Molecular techniques used towards identifying the composition and functions of microbial communities will be discussed. (Also listed as BIOL 615.).

BIOL 457. Ecology of Parasites. 3 Hours.
PR: BIOL 219 and BIOL 220. An introduction to the wide diversity of evolved relationships between parasites and their hosts. This course incorporates topics such as gene regulation, cell signaling, animal physiology, and evolution into a complete picture of host/parasite interactions.

BIOL 461. Principles of Evolution. 3 Hours.
PR: BIOL 221. Introduction to the study of evolution, including genetics of evolutionary change, speciation and adaptation molecular evolution, the history of life, extinction, co-evolution and the origins of humans.

BIOL 462. Ecosystem Models. 3 Hours.
PR: BIOL 221. Students will gain an understanding of the theory and mechanics behind ecosystem model, including models that predict soil decomposition and photosynthesis, ecosystem and terrestrial biosphere models. Students will also learn basic coding behind these models.

BIOL 463. Global Ecology. 3 Hours.
PR: BIOL 221 or GEOG 307. The Earth viewed as a changing biogeochemical system. Topics include the structure, composition and dynamics of the ecosphere, nutrient cycles, changing atmospheric composition, climate change, ozone depletion, land-use change, biological invasions, and changes in biodiversity.

BIOL 464. Population and Quantitative Genetics. 3 Hours.
PR: BIOL 221 and Coreq: BIOL 464L. Relationship of gene and genotype frequencies in populations of diploid organisms and the effects of mutation, selection, and non-random mating in relation to single gene pairs. Application of these concepts to multigenic inheritance of quantitative traits.

BIOL 464L. Population Genetics Laboratory. 0 Hours.
PR: Corequisite of BIOL 464. Population Genetics - BIOL 464 Laboratory.

BIOL 472. Neurodevelopmental Disorders. 3 Hours.
PR: BIOL 348 with a minimum grade of C-. Investigation of gene-environment interactions in the context of neurodevelopmental disorders. Students will gain a deeper understanding of how molecular and cellular level disruptions lead to variation in the display, severity, and occurrence of these disorders. Further, emphasis will be placed on interpreting, presenting, and discussing past and current research.

BIOL 474. Neurogenetics and Behavior. 3 Hours.
PR: BIOL 219 with a minimum grade of C-. Covers the principles and techniques that define the field of neurogenetics. Analyzes the development and function of the nervous system at cellular and molecular levels. Particular emphasis placed on genetic and environmental factors that contribute to human neurological disorders and the study of how genes control behavior.

BIOL 475. Neurobiological Diseases. 3 Hours.
PR or CONC: BIOL 348 with a minimum grade of C-. Physiological mechanisms of neurobiological diseases. Impact of neurobiological diseases on society, standard and experimental treatments and current research.

BIOL 476. Computational Neuroscience. 4 Hours.
PR: BIOL 348 with a minimum grade of C- and Coreq: BIOL 476L. Tools and concepts used to probe and characterize the dynamics of neurons, neural networks and neural coding mechanisms. Lectures introducing concepts and discussion sessions focusing on current research literature complement computer laboratories where the student learns programming skills, analytical tools and neural modeling methods used in computational neuroscience research.

BIOL 476L. Computational Neuroscience Laboratory. 0 Hours.
PR: BIOL 348 with a minimum grade of C- and Coreq: BIOL 476. Computational Neuroscience - BIOL 476 Laboratory.

BIOL 477. Evolution of the Human Brain. 3 Hours.
PR: BIOL 348 with a minimum grade of C-. Origin and evolution of the central nervous system, focusing on developmental and genetic mechanisms underlying structural modifications that serve as the basis for the evolution of animal behavior.

BIOL 478. Sensory Neural Systems and Behavior. 3 Hours.
PR: BIOL 348 with a minimum grade of C-. Exploration of how brains acquire information about the external world and process this information to produce sensory perceptions. Students gain a deep understanding of sensory transduction and neural processing at the cellular, network and systems levels. Additionally the class is aimed at enhancing science communication.

BIOL 479. Principles of Systems Neuroscience. 3 Hours.
PR: BIOL 348 with a minimum grade of C-. Fundamental principles of nervous system organization with an emphasis on interactions between neurons and the consequences for behavior. There will be a focus on recent advances in our understanding of each organizational principle.

BIOL 484. Undergraduate Research 1. 1-4 Hours.
PR: BIOL 219 with a minimum grade of C-. First in a sequence of three semester-long courses where original biological research is performed by a student under the direction of a member of the University faculty serving as the student's research mentor. Focus on writing and defending a research proposal as well as starting a research project in the laboratory.

BIOL 485. Undergraduate Research 2. 1-4 Hours.
PR: (BIOL 386 or BIOL 484) with a minimum grade of C-. Second in a sequence of three semester-long courses where original biological research is performed by a student under the direction of a member of the University faculty serving as the student's research mentor. Students will focus on selecting and employing proper laboratory techniques to collect and analyze data as well as to interpret the results of experimentation.

BIOL 486. Honors Investigation and Thesis. 1-4 Hours.
PR: BIOL 485 with a minimum grade of C-. Third in a sequence of three semester-long courses where original biological research is performed by a student under the direction of a member of the University faculty serving as the student's research mentor. Students will focus on remaining data analysis and interpretation as well as on writing and defending a research thesis.

BIOL 487. Experimental Design & Communication 2. 1 Hour.
PR: BIOL 387 with a minimum grade of C-. The third course in a three-course series providing professional development to Biology majors. This course focuses on argumentation and synthesis skills, analysis and communication of experimental results, problem solving, science and its effect on society, and sociopolitical/ethical problems related to the field of biology.

BIOL 490. Teaching Practicum. 1-3 Hours.
PR: Consent. (May be repeated for a maximum of 9 credit hours.) Teaching practice as a tutor or assistant.

BIOL 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

BIOL 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

BIOL 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BIOL 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

BIOL 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

BIOL 496. Senior Thesis. 1-3 Hours.
PR: Consent.

BIOL 497. Research. 1-6 Hours.
Independent research projects.

BIOL 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

BIOM 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

BIOM 201. Introduction to Biometrics Systems. 1 Hour.
PR: ENGR 102 with a minimum grade of C-. A basic introduction to biometric technologies, including the modalities of fingerprints, face, iris, and voice. An overview of essential biometrics terminology, use cases, and trends. Perspectives from industry, government, and academia, as presented by guest speakers.

BIOM 425. Bioengineering. 3 Hours.
Introduction to human anatomy and physiology using an engineering systems approach. Gives the engineering student a basic understanding of the human system so that the student may include it as an integral part of the design. Co-listed with MAE 473.

BIOM 426. Biometric Systems. 3 Hours.
PR: CS 111 and CS 111L and MATH 261 and STAT 215. This course presents an introduction to the principles of operation, design, testing, and implementation of biometric systems, and the legal, social, and ethical concerns associated with their use. (Cross-listed with EE 426.).

BIOM 457. Fundamentals of Photonics. 3 Hours.
Basic physics and optical engineering concepts necessary to understand the design and operation of photonic-based systems, including communications, nanophotonics, sensing and display technologies. Scaling, integration, and packaging of optical approaches and their compatibility with micro/nanosystems.

BIOM 480. Capstone Project - Design. 2 Hours.
PR: ENGL 102 or ENGL 103 and consent. Penultimate semester. Group senior design projects with individual design assignments appropriate to student's discipline. Complete system-level designs of the subsequent semester's project presented in written proposals and oral presentations. (Equivalent to CPE 480, CS 480 and EE 480.).

BIOM 481. Capstone Project - Implementation. 3 Hours.
PR: BIOM 480. Continuation of BIOM 480. Detailed design and implementation of the system including choice of components, algorithm development, interfacing, troubleshooting, working in groups, and project management. Also covers professional topics including ethics, liability, safety, socio-legal issues, risks, and employment agreements.

BIOM 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

BIOM 497. Research. 1-15 Hours.
Independent research projects.

BLAW 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BLAW 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

BLAW 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hr.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

BLAW 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BLAW 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

BLAW 496. Senior Thesis. 1-3 Hours.
PR: Consent.

BLAW 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

BMEG 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

BMEG 201. Introduction to Biomedical Engineering. 4 Hours.
PR: MATH 156 and CHEM 116 and BIOL 115. An introduction to biomedical engineering principles using foundational resources from molecular and cellular biology and physiology, and relating them to various sub-specialties of biomedical engineering. Concrete examples of applying engineering knowledge to solve problems related to human medicine as well as concrete examples of recent technological breakthroughs.

BMEG 203. Biomedical Engineering Seminar. 1 Hour.
PR or CONC: BMEG 201. Discussion of current aspects related to biomedical engineering including on-going research directions, technical, logistical and ethical issues.

BMEG 230. Numerical Methods in Biomedical Engineering. 3 Hours.
PR: BMEG 201 and PR or CONC: MATH 251 with a minimum grade of C-. Introduce the integrative set of computational problem solving tools important to biomedical engineers. Through the use of comprehensive homework exercises, relevant examples and extensive case studies, this course will integrate principles and techniques of numerical analysis into biomedical engineering concepts from cellular and molecular systems, to physiological and biomechanical phenomena and tissue systems.

BMEG 236L. Human Physiology: Quantitative Laboratory. 2 Hours.
PR: (BIOL 101 and BIOL 101L and BIOL 102 and BIOL 102L) or (BIOL 115 and BIOL 115L) and CHEM 116 and CHEM 116L and MATH 156 with a minimum grade of C- in each. Integrate engineering tools and approaches for quantitative measurements related to human physiology, including neural, cardiovascular, respiratory, and muscular systems.

BMEG 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BMEG 310. Biomedical Imaging. 3 Hours.
PR: BIOL 117 or BIOL 235. Introduction to biomedical imaging technologies including x-ray planar radiography, computed tomography (CT), nuclear medicine, optical imaging, ultrasound (US) and magnetic resonance imaging (MRI). Focus on physical principles, instrumentation methods, and imaging-related algorithms; medical interpretation of images will also be included to give practical examples of the development and applications of medical imaging.

BMEG 311. Biomaterials. 3 Hours.
PR: BMEG 201 and (BIOL 235 or (BIOL 117 and PHYS 111)). Principles of materials science and cell biology underlying the design of medical implants and artificial organs. Properties of living tissue, biocompatibility of polymers, metals, and ceramics; implants for hard and soft tissue.

BMEG 315. Transport Phenomena in Biological Systems. 4 Hours.
PR: (BIOL 235 or BIOL 117) and MATH 261. Develop fundamental relationships for momentum and mass transfer from microscopic and macroscopic balance equations and the application to biological systems that include biochemical reactions, inter-phase transport, and transient phenomena.

BMEG 321. Thermodynamics and Kinetics for Biomedical Engineering. 3 Hours.
PR: BMEG 230 and CHEM 116. Development of thermodynamic principles and their application to biological and biophysical systems. Topics will include first and second law; phase and reaction equilibria, kinetic rate laws and macromolecular thermodynamics.

BMEG 340. Biomechanics. 4 Hours.
PR: (BMEG 201 or MAE 243) and PHYS 111. Introduction to the basic approach of biomechanics and application in musculoskeletal, bone and human motion mechanics problems. Includes kinematics to analyze human motion, biomechanics of bone and skeletal system and biomechanical behavior of fibers.

BMEG 350L. Biomedical Engineering Laboratory. 2 Hours.
PR: (BIOL 117 or BIOL 235) and BMEG 201. Measurement and interpretation of data from tissue and materials in the areas of biomaterials, biomechanics, bionanotechnology, and biomedical imaging.

BMEG 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BMEG 410. Drug Discovery and Delivery. 3 Hours.
PR: BMEG 321 or CHE 321. This course will cover the drug discovery from ideation to testing through the lens of fundamentals of biomedical engineering. Course will focus on biomaterials, formulation, targeting, pre-clinical testing, clinical testing, and imaging considerations.

BMEG 420. Biomedical Instrumentation. 3 Hours.
PR: EE 221 and PR or CONC: BMEG 420L. Fundamentals of biomedical instrumentation and devices. Clinical applications of medical instrumentation, sensors, devices, biopotential electrodes and amplifiers, measurement of blood flow, different medical imaging systems, and therapeutic and prosthetic devices.

BMEG 420L. Biomedical Instrumentation Laboratory. 1 Hour.
PR or CONC: BMEG 420. Integrate engineering tools and approaches for quantitative measurements related to human physiology, including neural, cardiovascular, respiratory, and muscular systems.

BMEG 421. Biomedical Engineering Seminar and Journal Club. 1 Hour.
PR: BMEG 203. Introduction to current research and topics pertinent to biomedical engineering through literature review and guest lectures by external and internal speakers.

BMEG 455. Biomedical Senior Design 1. 2 Hours.
PR: BMEG 310 and BMEG 311 and BMEG 315 and BMEG 340 and PR or CONC: BMEG 455S. Planning, designing, and reporting solutions to challenging biomedical engineering problems that have clinical implication. Also covers professional topics, including ethics, liability, safety, socio-legal issues.

BMEG 455S. Biomedical Senior Design 1 Capstone Project. 2 Hours.
PR: BMEG 310 and BMEG 311 and BMEG 315 and BMEG 340 and PR or CONC: BMEG 455. Planning, designing, and reporting solutions to challenging biomedical engineering problems that have clinical implication. Also covers professional topics, including ethics, liability, safety, socio-legal issues.

BMEG 456S. Biomedical Senior Design 2. 3 Hours.
PR: BMEG 455 and BMEG 455S. Continuation of BMEG 455.

BMEG 480. Cellular Machinery. 3 Hours.
PR: BIOL 115 or Consent. Fundamental understanding of how a cell operates like a chemical factory; understanding how self-sustaining capacity of the cell's complex chemical reaction networks and cellular components can be manipulated in a synthetic environment.

BMEG 481. Applied Bio-Molecular Modeling. 3 Hours.
PR: BMEG 201 and MATH 261 and (CHEM 231 or CHEM 233). This course provides an introduction to modern molecular- level computational methods for calculating properties of reaction systems and thermodynamic, transport, and structural properties of materials with a particular focus on biological applications.

BMEG 482. Introduction to Tissue Engineering. 3 Hours.
PR: BMEG 201 and BMEG 311. This course introduces biological principles and engineering fundamentals pertaining to cell behavior and substrate properties. The design and characterization of artificial tissues will be discussed using properties and function of native tissues as a guide.

BMEG 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

BMEG 495. Independent Study. 1-6 Hours.

BMEG 496. Senior Thesis. 1-6 Hours.

BMEG 497. Research. 1-6 Hours.

BMEG 498. Honors Research. 1-6 Hours.

BMM 235. Introduction to Molecular Medicine. 3 Hours.
This course illustrates how knowledge at the molecular level has changed our understanding of major human disease types and the way they are diagnosed and treated. Required course for the minor in Molecular Medicine; suitable for Biology, Biochemistry, Immunology and Medical Microbiology, Exercise Physiology, Biomedical Engineering majors, pre-professional students and everyone with an interest in a health care-related career.

BMM 339. Introduction to Human Biochemistry. 4 Hours.
PR: CHEM 231 or CHEM 233. This course emphasizes human biochemistry and closely follows the format and content of biochemistry courses that are required for the MD, DDS, and other professional degree programs in Health Sciences. It provides an introduction to biochemistry for undergraduate pre-professional students, and students in the Molecular Medicine minor, Biochemistry major, Exercise Physiology major, and Immunology and Medical Microbiology major.

BMM 407. Methods to Diagnose Diseases. 2 Hours.
PR: BMM 235 and PR or CONC: (AGBI 410 or BMM 339) with a minimum grade of C- in each. The course will introduce students to modern biochemical and cell biology techniques and approaches used to diagnose human diseases. The course fulfills requirements for the Molecular Medicine minor.

BMM 445. Molecular Mechanisms of Age-Associated Diseases. 3 Hours.
PR: BMM 235 and (AGBI 410 or BMM 339) with a minimum grade of C- in each. The course will offer an in-depth study of the molecular and biochemical mechanisms of major human diseases (cancer, neurodegenerative diseases, diseases of the immune system) and their link to common processes involved in cellular aging. The course fulfills requirements for the minor in Molecular Medicine; suitable for Biology, Biochemistry, Immunology and Medical Microbiology, Exercise Physiology, Biomedical Engineering majors, pre-professional students.

BMM 452. Molecular Mechanisms of Metabolic Disorders. 3 Hours.
PR: BMM 235 and (AGBI 410 or BMM 339) with a minimum grade of C- in each. The course will emphasize in-depth knowledge of the major metabolic pathways in human cells and their deregulation in hereditary and acquired metabolic diseases (inborn errors of metabolism, diabetes, cardiovascular disease, nutritional disorders). The course fulfills requirements for the minor in Molecular Medicine; suitable for Biology, Biochemistry, Immunology and Medical Microbiology, Exercise Physiology, Biomedical Engineering majors, pre-professional students.

BMM 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BMM 497. Research. 1-6 Hours.
Independent research projects.

BUDA 450. Business Data Mining and Visualization. 3 Hours.
PR: (MATH 150 with a minimum grade of C- or MATH 155 with a minimum grade of D-) and (STAT 211 or ECON 225 or STAT 215 with a minimum grade of C-). This course introduces students to basic concepts and methods of data mining and visualization for higher-order business analytics. Basic data mining tasks and methods will be discussed with their application to business problems. Hands-on exercises of fundamental techniques and visualization in R, a programing language for statistical computing and graphics, are delivered through walk-through materials.

BUDA 451. Advanced Business Data Mining. 3 Hours.
PR: (ACCT 425 or BUDA 450 or BUDA 455) with a minimum grade of C-. This course enables students to use higher order concepts and models in data mining that impact business. Concepts such as supervised and unsupervised learning will be covered, with a focus on business outcomes, cases, and communication.

BUDA 452. Business Simulation Modeling. 3 Hours.
PR: (ECON 225 or STAT 211 or STAT 215) with a minimum grade of C-. This course introduces basic concepts and approaches to business simulation modeling using computer software. Students define business problems with variables and constraints, develop computer programs to simulate the situations, and analyze the results for decision making, comparing with analytical models.

BUDA 453. Advanced Simulation with AI. 3 Hours.
PR: BUDA 452 with a minimum grade of C-. This course introduces the principles of agent-based modeling (ABM) and explores advanced simulation techniques, emphasizing the integration of artificial intelligence (AI) techniques (for example, large language models; LLM) and the application of analytical frameworks (for example, game theory, decision theory) to analyze strategic interactions among agents.

BUDA 455. Introduction to Business Intelligence and Artificial Intelligence. 3 Hours.
PR: (MATH 150 with a minimum grade of C- or MATH 155 with a minimum grade of D-) and (ECON 225 or STAT 211 or STAT 215 with minimum grade of C-). This course introduces students to basic concepts in business intelligence (BI) and provides students with an understanding of basic artificial intelligence (AI) techniques for BI. With hands-on exercises, students will learn how to preprocess data, create BI from data, visualize BI, and implement data analytic pipelines for BI with AI techniques.

BUDA 460. Artificial Intelligence and Machine Learning for Business. 3 Hours.
PR: (BUDA 450 or BUDA 455) with a minimum grade of C-. This course introduces students to important concepts and algorithms at the foundation of modern AI. The main goal is to provide systematic understanding of AI and how to apply AI techniques to real-world business problems. Through hands-on demos and projects, students gain exposure to the theory behind classification, optimization, and other topics in artificial intelligence and machine learning.

BUDA 461. Generative AI-Concepts, Models, & Applications. 3 Hours.
PR: BUDA 460 with a minimum grade of C-. This course provides a comprehensive exploration of Generative AI, covering foundational concepts, state-of-the-art models, and real-world applications. Students will gain theoretical knowledge and hands-on experience to understand and implement cutting-edge techniques in Generative AI, with a focus on their applications in various domains.

BUDA 468. Introduction to Applied AI and Data Analytics in Practice. 3 Hours.
PR: (BUDA 450 or BUDA 455) and MIST 351 with a minimum grade of C- in each. This course introduces students to the foundational concepts and practices of working with clients in data analytics and applied AI. Topics include understanding client requirements, industry trends, professionalism, project planning, and the initial phases of real-world project management. Students will engage with guest speakers from industry and participate in activities to prepare for the capstone course.

BUDA 470. Applied Artificial Intelligence and Data Analytics in Practice. 3 Hours.
PR: BUDA 468 and PR or CONC: BUDA 451 and BUDA 453 and BUDA 461 and MIST 462 all with a minimum of C-. The course allows students to apply artificial intelligence and data analytics tools to real-world problems from business, government, or non-profit organizations. Students will complete a final project holistically integrating their accumulated knowledge from the B.S. Applied AI and Data Analytics curriculum, potentially including data collection, data management, basic and advanced statistical analyses, data mining, data modeling, simulation, and data visualization.

BUDA 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

BUDA 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

C&I 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

C&I 304. Social/Emotional Learning and Trauma-Informed Teaching. 2 Hours.
This course provides a basic understanding of the importance of social/emotional learning and leading instruction with a trauma-informed lens. Students will engage in activities and readings focused on the multi-faceted needs of children and youth in schools and classrooms, the importance of building a foundation in mindfulness practices as a way to support resiliency in school-age children.

C&I 311. ELL and Language Acquisition for Elementary Teachers. 2 Hours.
This course is designed to develop a student's understanding of the theoretical foundations of L2 learning and acquisition as well as understanding of the unique aspects of the process of L2 teaching, facilitating, and learning specific to the integration within the PK-6 classroom.

C&I 324. Teaching Language Arts: Secondary School. 3 Hours.
Includes an examination and application of relevant curricular materials and teaching techniques.

C&I 337. Mathematics in the Junior High School and Middle School. 3 Hours.
PR: 6 hours of college mathematics or consent. Study of teaching of mathematics in the junior high school and/or middle school; application of mathematics content to teaching; instructional techniques and materials.

C&I 365. Dance and Movement in PK-12 Schools. 2 Hours.
This course provides a basic understanding of the principles and potential of standards-based dance education as integration as a fine art.

C&I 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

C&I 410. Early Childhood Education 1. 3 Hours.
PR: CDFS 316. An introduction to curriculum objectives, instructional methods and materials, and evaluation in early childhood education. (Pre-K to 4th grade) that includes a field experience with individualized instruction for one child.

C&I 411. Early Childhood Education 2. 3 Hours.
PR: C&I 410. This course is designed for individuals who will be working in early childhood education Pre-K to 4th grade. Topics include: working with families of young children; designing, teaching and evaluating experiential lessons for small groups of children; and gathering and assessing developmental data on small groups of children. A semester-long field experience with a class of young children is required.

C&I 412. Methods in Preschool Education. 3 Hours.
PR: EDUC 200 or equiv. Development of an experiential model of teaching young children. Application of methods in basic needs areas of nursery-early childhood education consistent with an experiential model of teaching.

C&I 413. Early Childhood Issues and Methods. 3 Hours.
Bridging theory and practice, this course helps K-6th grade preservice teachers learn to understand the complexities of the field and to teach all young children well. This course provides an opportunity for individuals to examine and expand their understandings of early childhood education.

C&I 414. Creative Experiences in Early Childhood. 3 Hours.
PR: EDUC 200 or equiv. Examination of creative experiences for young children and their relationship to child development. A special focus on play behavior as a learning medium with emphasis on program planning, curriculum development, and instructional strategies.

C&I 416. Early Language and Communication Experiences. 3 Hours.
PR: EDUC 200 or equivalent. Presents activities for developing language and communication skills in children 2-5 years of age. Covers a broad range of temporary and enduring forms of communication in visible and audible media.

C&I 418. Management of Preschool Education. 3 Hours.
PR: EDUC 200 or equiv. (A field experience with children 2-5 years of age is required.) Planning, designing, and assessing programs for children ages 2-5 years with emphasis on management skills. (Alternate Years.).

C&I 424. Approaches to Teaching Language. 3 Hours.
PR: ENGL 102. Designed for prospective teachers of English and language arts. Focus is upon planning and implementing methods of teaching English as a language. Materials and resources appropriate for public school instruction are analyzed and utilized.

C&I 425. Approaches to Teaching Reading in ELA. 3 Hours.
PR: Junior standing. Designed for prospective teachers of English and language arts. Course focuses upon methodologies for teaching literature in public schools and strategies for supporting reading fluency and comprehension in English and language arts classrooms. Workshop format will provide opportunities for peer teaching activities as students apply methods of teaching literature.

C&I 431. Mathematics Methods for Elementary Teachers 1. 3 Hours.
PR: C&I 230 and C&I 231 and PR or CONC: EDUC 311 with a minimum grade of C- in all. This course introduces students to methods for teaching all children in developmentally appropriate topics in elementary mathematics. Emphasis is placed on current movements in mathematics education, the big ideas of elementary mathematics, teaching for understanding, and understanding children's mathematical thinking. Students engage in examining and analyzing children's mathematical thinking and work, examining and analyzing standards documents, and analyzing curricular materials.

C&I 433. Mathematics Methods for Elementary Teachers 2. 3 Hours.
PR: C&I 431 with a minimum grade of C-. This course continues students' study of methods for teaching all children in developmentally appropriate topics in elementary mathematics. Emphasis is placed on current movements in mathematics education and developing effective teaching practices for teaching children mathematics for understanding. Students engage in developing skills for leading productive classroom discussions about mathematics and plan, implement, and assess instruction using appropriate tools.

C&I 440. Science Methods for Elementary Teachers 1. 3 Hours.
This course is designed to introduce students to the teaching and learning of elementary science through analysis of teaching methods/approaches, curriculum patterns, and trends in elementary school science. Emphasis is placed on current movements in science education, the big ideas of elementary science, teaching for understanding, and recognizing and responding to children's thinking and ideas about the natural/physical world.

C&I 442. Science Methods for Elementary Teachers 2. 3 Hours.
PR: C&I 440 with a minimum grade of C-. This course is the second course in the Science Methods for Elementary Teachers sequence and continues students' study of the teaching and learning of elementary science. In this course, students engage in examining and analyzing children's work, classroom science talk, classroom video, science curricula, inquiry lesson plans, and other artifacts as well as designing and leading age-appropriate inquiry lessons.

C&I 452. Social Studies for Elementary Teachers 2. 3 Hours.
PR: C&I 451 with a minimum grade of C-. This course is a 3-credit semester-long undergraduate level course bridging theory and practice. This course builds on the foundation provided in C&I 451 in order to strengthen, deepen and expand capacities to be a reflective teacher. The course focuses of place-based education, integration of environmental science methods, and advanced methods for teaching social studies PK-6.

C&I 453. Disciplinary Foundations for Social Studies Teaching. 3 Hours.
PR: EDUC 200 with a minimum grade of C-. This lecture-based course examines national, state, and local curriculum standards for elementary social studies; the relationship between social science disciplines and the elementary curriculum; multicultural perspectives on teaching and learning, and the effects of curricular, instructional, and assessment patterns on children's understanding of social studies concepts and methods.

C&I 454. Teaching Social Studies: Secondary School. 3 Hours.
Includes an examination and application of relevant curricular materials and teaching techniques.

C&I 461. Exploring and Developing Literacy Foundations. 3 Hours.
This course creates opportunities for students to explore and develop understandings of multiple literacies. Students will engage in an analysis of literacy curriculum and instruction in real world schools and reflect on the implications of this analysis and their understanding of the philosophical/theoretical foundations of various literacies and frameworks for creating equitable curriculum and learning environments in their future teaching.

C&I 462. Literacy 2: Reading Assessment and Instruction. 3 Hours.
PR: C&I 461 with a minimum grade of C-. This course creates opportunities for students to develop theoretical and pedagogical foundations for creating learning environments and curriculum that support K-5 students' development as readers across social, cultural, and linguistic differences. Students explore and consider the implications of current issues in reading instruction and literacy policies and the connections between reading and writing as they design and implement literacy instruction.

C&I 480. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 hours in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480A. Special Problem and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480B. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480C. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480D. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480E. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480F. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480G. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480H. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480I. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480J. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480K. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480L. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480M. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480N. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480O. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480P. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480Q. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480R. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480S. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480T. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480U. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480V. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480W. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480X. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480Y. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 480Z. Special Problems and Workshops. 2-4 Hours.
(Maximum of 8 semester hours may be applied toward the master's degree.) PR: 14 Hr. in education. Credits for special workshops and short intensive unit courses on methods, supervision, and other special topics.

C&I 489. Identity and Cultural Diversity in the Classroom. 3 Hours.
This course is designed to help school professionals create effective learning environments for all students. It will provide students with socio-historical global perspectives for the study of race, ethnicity, language, gender/sexuality, (dis)ability, culture, religion and other differences in an increasingly globalized world. It will provide collective reflection about the multiple meanings of diversity and multiculturalism in American education.

C&I 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

C&I 491. Professional Field Experience. 1-18 Hours.
PR: Consent (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

C&I 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

C&I 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

C&I 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

C&I 496. Senior Thesis. 1-3 Hours.
PR: Consent.

C&I 497. Research. 1-6 Hours.
Independent research projects.

CAHS 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

CAHS 300. Career Exploration in Applied Human Sciences. 3 Hours.
Engages students in professional identity, skill development, and career preparedness. Topics include professionalism principles, tools for employee success and wellness, financial literacy for a sustained future, diversity, equity, and inclusion in the workplace, and advanced career exploration and planning.

CAHS 489. Capstone Experience in AHS. 3 Hours.
Engages students in experiential learning opportunities that target knowledge and skill integration, meaningful reflection, and effective transition post-graduation.

CDFS 101. Introduction to Child Development and Family Studies. 1 Hour.
This course will introduce students to the following: Child Development and Family Studies Program, West Virginia University, core objectives of a First Year Experience, major requirements, program expectation and career possibilities with an emphasis on critical thinking and college survival skills.

CDFS 110. Families Across the Life Span. 3 Hours.
Explores the physical, psychological, and cognitive developmental changes of individuals who are functioning in family systems that change across the life-span.

CDFS 112. Introduction to Family Processes and Dynamics. 3 Hours.
Students will explore family processes and dynamics. Attention will be given to how family forms, functions, and expectations have changed across generations. Thus, students will study contemporary families in relation to how the concept of family has evolved over time.

CDFS 116. Exploring and Thriving during Emerging Adulthood. 3 Hours.
Emerging adulthood involves navigating the path from adolescence to adulthood. Students will explore how societal changes have elongated the path to adulthood, leading to emerging adulthood as a distinct developmental stage. By evaluating the features of emerging adulthood, students will learn how emerging adults' development influences their identities, intimate relationships, and educational and occupational goals.

CDFS 120. Love, Sex, and Intimate Relationships Across the Lifespan. 3 Hours.
This course focuses on how we develop intimate relationships including friendships, romantic relationships, and sexual partnerships, including the forms and functions of different types of relationships. Attention is given to how intimate relationships support development, health, and wellness. Students will learn the characteristics of healthy intimate relationships as well as signs of relationship stress and challenge.

CDFS 172. Health, Safety, & Nutrition in Early Childhood. 3 Hours.
Examines physical, nutritional, and safety needs that influence the growth and development of young children including non-medical-professional emergency training for the sick and injured leading to adult, child, and infant basic life support, CPR/AED and first aid certification.

CDFS 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

CDFS 210. Introduction to Parenting. 3 Hours.
Introduction of terminology, descriptions, and explanations of the parental role and parent-child interactions. Emphasis on social and personal definitions of the parental role and on the problems and changes in parent-child relationships.

CDFS 211. Infant Development. 3 Hours.
Developmental characteristics and environmental effects on the child during the prenatal period and the first two years with implications for guidance and care, includes practical experience working with infants and toddlers.

CDFS 212. Development in Early and Middle Childhood. 3 Hours.
PR: CDFS 110 with a minimum grade of C-. An introductory course to physical, gross motor, fine motor, cognitive, language, social, and emotional development during the preschool and elementary years, includes field experience observing and assessing preschool- and elementary-aged children.

CDFS 250. Research Methods. 3 Hours.
This course provides an overview of principles and methods of quantitative and qualitative research; developmental knowledge and strategies needed to read, interpret, and evaluate the quality of research reports.

CDFS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CDFS 316. Child Development Practicum. 3-4 Hours.
PR: CDFS 212 or PSYC 241. Application of child development principles. Involves planning developmentally appropriate activities for three-four-and five-year old children at the West Virginia University Child Development Laboratory.

CDFS 317. Hospital Child Life Practicum. 3 Hours.
PR: CDFS 212 and CDFS 316. Application of development principles to children in the hospital. Assignments involve learning intervention techniques to minimize hospital-generated stress and enhance normal development and family experience.

CDFS 318. Child Development and Societal Institutions. 3 Hours.
This course will examine development of the individual in the context of relationships with the formal and informal institutions of society. An examination of various aspects of development from the broad perspective of the social sciences will be examined throughout the course.

CDFS 320. Family Life Education. 3 Hours.
Introduces the general philosophy and broad principles of family life education along with the range of programs available. An opportunity is given to plan, implement, and evaluate such educational programs for diverse audiences.

CDFS 321. Family Policy and Law. 3 Hours.
Explores at the federal and state level the process of policy formation, implementation, and evaluation as it relates to family life. Introduces the laws regulating such family life activities as marriage, parenting, and divorce.

CDFS 322. Romantic and Sexual Development during Adolescence. 3 Hours.
This course situates romance, sex, and sexuality as normal and healthy aspects of adolescence. Using contemporary frameworks, students will examine important markers of romantic and sexual health during adolescence. Finally, students will analyze policy and programmatic efforts to promote romantic and sexual health during adolescence.

CDFS 350. Family Life: Historical Experiences and Contemporary Expectations. 3 Hours.
Students will explore the history of family life in the United States, including how family has been defined and the expectations society has had for families. Drawing on the history of family life, the course will examine how changes in family demographics are creating new forms of family life and expectations for contemporary family life.

CDFS 410. The Science of Positive Youth Development. 3 Hours.
Positive Youth Development (PYD) focuses on improving competence, confidence, character, connection, and caring among youth to instill a sense of thriving in youth. Students will learn the origins of PYD, how its principles are applied in the development of youth focused programs, review research on how PYD impacts youth, how youth contribute to society.

CDFS 412. Adolescent Development. 3 Hours.
The adolescent in contemporary American culture, including normative physical, social, and personality development; relationships within various typical social settings. (e.g., family, school, community, peer group.).

CDFS 413. Stress in Families. 3 Hours.
PR: (CDFS 110 or CDFS 112) with a minimum grade of C- or consent. Study of recent research findings in the major areas of family relationships. Topics include effects of family violence, substance abuse, poverty, and health.

CDFS 414. Adolescent Problems and Disorders. 3 Hours.
PR: Department approval is required and must be enrolled as one of the following classifications of Graduate or Senior. Focuses on non-normative aspects of adolescent development including social, behavior, emotional, and psychological problems. Prevention and intervention strategies are examined.

CDFS 415. Family Interaction and Communication. 3 Hours.
PR: Senior or graduate standing or consent. This course examines family processes, communication, and interactions between family members, including intimate partners, siblings, and parent-child relationships. We examine family and communication theories and empirical work including communication, conflict, intimacy, power, family rituals and stories, and development of family identity. We consider how gender, culture, race, ethnicity, sexual orientation and social class influence family processes and communication.

CDFS 416. Trauma, Resiliency, and Children. 3 Hours.
PR: Senior standing. Overview of core issues of trauma and its impact on children and families, with an emphasis on growth, learning, and adult relationships. Students apply critical inquiry to explore the broader impact of trauma on society, including individual productivity and financial costs, and develop public awareness and learning material.

CDFS 417. Families and Health. 3 Hours.
Explores relationships between family structure, processes, and dynamics and various aspects of individual and family health behaviors, outcomes, and healthcare. Students will integrate family and health science models and theories to examine family as a health determinant. Emphasis is placed on understanding how families use strengths to promote health and well-being.

CDFS 420. Leadership in Early Childhood. 3 Hours.
This course provides information on developing effective leadership skills in early childhood settings, advocating for children and families, and developing collaborative partnerships.

CDFS 421. Child Care Center Administration. 3 Hours.
Focuses on skills necessary for directing a high quality child care center. Participants will gain knowledge in program planning, development, and maintenance.

CDFS 422. The Business of Child Care Management and Financial Strategies. 3 Hours.
This course is designed to provide essential business and management lessons in operating a high quality early child care center.

CDFS 423. External Funding: Early Childhood Programs. 3 Hours.
Provides the opportunity to learn and understand external funding sources and the application of grant writing process in relationship to early childhood programs.

CDFS 430. Best Practices in Pre-K Movement. 3 Hours.
The course will prepare students to plan, develop and implement an appropriate structured movement program so young children can be physically active and to set the stage for lifelong physical activity.

CDFS 431. Infant Toddler Language and Literacy. 3 Hours.
This course focuses on language and literacy development in infants and toddlers in an early childhood setting.

CDFS 432. Early Socio-Emotional Development. 3 Hours.
PR: CDFS 211 with a minimum grade of C-. An advanced course in infant and toddler socio-emotional development. The course will focus on the development of emotion, relationships, and the curriculum to promote infant socio-emotional well-being.

CDFS 435. Youth in Society. 3 Hours.
Students will examine the social institutions that youth can interact with. Attention will be given to determining how well those institutions support youth on their path to adulthood. Students will also explore social policies aimed at enhancing youth development. Finally, the course will also reflect on the critically important ways that youth contribute to society.

CDFS 468. Reflections in Early Childhood Special Education Student Teaching. 3 Hours.
PR: ECSE 419 with a minimum grade of C- and successful completion of all coursework prior to student teaching, and passing scores on all required Praxis Exams. This course provides the opportunity to reflect, evaluate and improve experiences during student teaching. The course will also reflect on early childhood leadership qualities. This course accompanies ECSE 419.

CDFS 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

CDFS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

CDFS 491A. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

CDFS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CDFS 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

CDFS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

CDFS 496. Senior Thesis. 1-3 Hours.
PR: Consent.

CDFS 497. Research. 1-6 Hours.
Independent research projects.

CDFS 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

CE 191. First-Year Seminar. 1-3 Hours.
Engages students in Investigation of topics not covered in regularly scheduled active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

CE 201. Introduction to Civil Engineering. 1 Hour.
PR: ENGR 102. Overview of civil engineering disciplines and careers including structural, environmental, hydrotechnical, geotechnical and transportation engineering. Addresses the technical concepts and career opportunities in each area. Emphasis on providing guidance for success in completing undergraduate studies.

CE 210. Introduction to Computer Aided Design and Drafting for Civil Engineers. 2 Hours.
PR: ENGR 102 and PR or CONC: CE 210L. An introduction to computer-aided design and drafting (CADD) software for communicating design plans and specifications for civil and environmental engineering projects.

CE 210L. Introduction to Computer Aided Design and Drafting for Civil Engineers Laboratory. 1 Hour.
PR: ENGR 102 and PR or CONC: CE 210. Laboratory for CE 210.

CE 273. American Society of Civil Engineers Workshop. 1 Hour.
The course provides a formal structure for meeting and conducting activities necessary to compete in competitions such as the concrete canoe, steel bridge, technical problem solving, and surveying. It does not satisfy any graduation requirement.

CE 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CE 301. Engineering Professional Development. 1 Hour.
PR: CE 201. Non-technical issues facing graduate engineers; career paths, job search, professional registration, legal issues, engineering ethics, professional societies, and life-long learning.

CE 304. Gender in Engineering and Technology Careers. 3 Hours.
PR: ENGL 101 with a minimum grade of C-. Examine the history of gender diversity in the engineering and technology workforce; investigate factors contributing to gender inequality in engineering and technology careers and discuss solutions; develop skills to apply to the professional engineering workforce for diverse populations.

CE 305. Introduction to Geomatics. 2 Hours.
PR: CE 210 and PR or CONC: CE 305L. Introduction to the theory and practice of the technologies used to measure, calculate, acquire, process, and display terrain and other data for use in mapping, planning, designing, constructing, and managing the built and natural environments.

CE 305L. Introduction to Geomatics Laboratory. 1 Hour.
PR: CE 210 and PR or CONC: CE 305. Laboratory for CE 305.

CE 310. Civil Engineering Materials. 3 Hours.
PR: MAE 243. Physical, chemical, and molecular properties of materials commonly used in civil engineering works. Influence of these properties on the performance and use of materials.

CE 321. Fluid Mechanics for Civil Engineers. 3 Hours.
PR: MATH 261 and MAE 241 with a minimum grade of C- in each. Fluid properties, statics, and kinematics; conservation laws for mass, momentum, and mechanical energy; piezometric head and grade lines; dimensional analysis and similitude; weir and orifice flow; introduction to flow in pipes and open channels. (3 hr. lecture.).

CE 322. Hydrotechnical Engineering. 3 Hours.
PR: CE 321. Flow in pipes and pipe networks; pumps; uniform and gradually varied open channel flow; design of water distribution, sanitary sewer, and storm water collection systems.

CE 332. Introduction to Transportation Engineering. 3 Hours.
PR: (MATH 156 with a minimum grade of C-) or (MATH 151 and STAT 211). Integrated transportation systems from the standpoint of assembly, haul, and distribution means. Analysis of transport equipment and traveled way. Power requirements, speed, stopping, capacity, economics, and route location. Future technological developments and innovations.

CE 347. Introduction to Environmental Engineering. 3 Hours.
PR: WVU sections require CHEM 115 and CHEM 115L and MATH 156 with a minimum grade of C- in each and PR or CONC: CE 347L, WVUIT sections require CHEM 116 and MAE 331 and PR or CONC: CE 347L. Introduction to physical, chemical, and biological characteristics of waters and wastewaters, and fundamental principles of water and wastewater treatment including hands-on laboratory exercises.

CE 347L. Introduction to Environmental Engineering Laboratory. 1 Hour.
PR: WVU sections require CHEM 115 and MATH 156 with a minimum grade of C- in each, WVUIT sections require CHEM 116 and MAE 331 and PR or CONC: CE 347. Laboratory for CE 347.

CE 351. Introductory Soil Mechanics. 3 Hours.
PR: WVU sections require CE 201 and (CE 210 or MINE 261) and MAE 241 and MAE 243 and MATH 261 and STAT 215 with a minimum grade of C- in each and PR or CONC: CE 351L, WVUIT sections require GEOL 312 and MAE 243 and PR or CONC: CE 351L. Introduction to geotechnical engineering, fundamental soil properties, classification of soils, soil compaction, permeability, compressibility, and consolidation of soils, shear strength, lateral earth pressures.

CE 351L. Introductory Soil Mechanics Laboratory. 1 Hour.
PR: WVU sections require CE 201 and (CE 210 or MINE 261) and MAE 241 and MAE 243 and MATH 261 and STAT 215 with a minimum grade of C- in each and PR or CONC: CE 351, WVUIT sections require GEOL 312 and MAE 243 and PR or CONC: CE 351. Laboratory for CE 351.

CE 361. Structural Analysis 1. 3,4 Hours.
PR: WVU sections require CE 201 and (CE 210 or MINE 261) and MAE 241 and MAE 243 and MATH 261 and STAT 215 with a minimum grade of C- in each and PR or CONC: CE 361L, WVUIT sections require MAE 243 and PR or CONC: CE 361L and MATH 251. Stability, determinacy, and equilibrium of structures; shear and bending moment diagrams of determinate and indeterminate beams and frames; analysis of trusses; displacement of planar structures by geometric and energy methods.

CE 361L. Structural Analysis 1 Laboratory. 1 Hour.
PR: WVU sections require CE 201 and (CE 210 or MINE 261) and MAE 241 and MAE 243 and MATH 261 and STAT 215 with a minimum grade of C- in each and PR or CONC: CE 361, WVUIT sections require MAE 243 and PR or CONC: CE 361 and MATH 251. Laboratory for CE 361.

CE 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CE 411. Pavement Design. 3 Hours.
PR: WVU sections require CE 351 and CE 351L, WVUIT sections require CE 312 and CE 331 and CE 351 and CE 351L. Effects of traffic, soil, environment, and loads on the design and behavior of pavement. Design of pavement structures. Pavement performance and performance surveys.

CE 413. Construction Scheduling. 3 Hours.
PR: CE 332 or (CE 347 and CE 347L) or (CE 351 and CE 351L) or (CE 361 and CE 361L). Study of construction methods, equipment, and administration with particular emphasis on the influence of new developments in technology.

CE 414. Construction Engineering. 3 Hours.
PR: CE 332 or (CE 347 and CE 347L) or (CE 351 and CE 351L) or (CE 361 and CE 361L). Introduce student to the role of the civil engineer in the construction process, including critical path analysis, productivity estimation, equipment capability and selection.

CE 415. Flexible Pavements. 3 Hours.
PR: CE 310. Design, construction and maintenance of flexible pavements, including material characterization, mix design, construction methods, pavement design and evaluation, and maintenance procedures.

CE 416. Advanced Concrete Materials. 3 Hours.
PR: MAE 243. Microstructure and properties of portland cement pastes, rheology, maturity, strength properties, non-linear fracture mechanics, early age volume changes, creep and shrinkage models, transport mechanism and durability of concrete, special concretes.

CE 417. Infrastructure Asset Management 1. 3 Hours.
PR: CE 332 or (CE 347 and CE 347L) or (CE 351 and CE 351L) or (CE 361 and CE 361L). Integrated course that covers different strategies in supporting and sustaining civil infrastructure systems which include transportation, drinking and waste water, and energy systems. This course focuses on the maintenance stage, which broadly includes maintenance, repair, rehabilitation, and replacement, of the lifetime of an infrastructure (e.g., planning, design, construction, and operation/maintenance).

CE 418. Construction Estimating. 3 Hours.
PR: CE 332 or (CE 347 and CE 347L) or (CE 351 and CE 351L) or (CE 361 and CE 361L). A construction engineer evaluates engineering design and site situation in order to predict time and cost implications for “what if” scenarios and achieve safety, quality and efficiency in construction. This course will facilitate students to learn how to define, assess and analyze such “what-if” scenarios in construction with regards to Design, Materials, Method, Quantity, Productivity, and Rate.

CE 419. Building Information Modeling. 3 Hours.
PR: CE 332 or (CE 347 and CE 347L) or (CE 351 and CE 351L) or (CE 361 and CE 361L). Introduce building information modeling and how to apply the tools to develop solutions in building design.

CE 420. Computational Fluid Mechanics. 3 Hours.
PR: CE 321. Use of the computer in elementary hydraulics, open channel flow, potential flow, and boundary layer flow, numerical techniques for solution of algebraic equations, ordinary differential equations, and partial differential equations. (3 hr. lec.).

CE 423. Water System Design. 3 Hours.
PR: CE 321. This course extends the student’s understanding of fluid mechanics and brings it to bear on common and important areas of water system design: water distribution systems, sanitary sewer systems, and storm water collection systems.

CE 425. Engineering Hydrology. 3 Hours.
PR: WVU sections require CE 321, WVUIT sections require MAE 331. Scientific basis of the hydrologic cycle and its engineering implications; rainfall-runoff processes, hydrographs, flood routing, and statistical methods. (3 hr. lec.).

CE 427. Water Resources Engineering. 3 Hours.
PR: CE 321. Application of hydrologic and hydraulic principles in the design and analysis of water resource systems; probability concepts and economics in water resource planning, water law, reservoir operations, hydraulic structures, flood damage mitigation, hydroelectric power, and drainage.

CE 429. Ecological Engineering. 3 Hours.
PR: CE 321 with a minimum grade of C-. Course will explore the principles of ecological engineering for the design of sustainable ecosystems. Applications include the restoration of streams, lakes and reservoirs, wetlands, and disturbed mined land reclamation.

CE 430. Data Analysis in Civil and Environmental Engineering. 3 Hours.
PR: STAT 215 with a minimum grade of C-. Data analysis, as a subtopic of data analytics in civil and environmental engineering, is concerned with analyzing collected data to identify potential solutions to engineering problems. Aims to provide students with a general background in applying various quantitative data analysis techniques to clean, transform, and model data, and in best practices of interpretation and communication of the results.

CE 431. Highway Engineering. 3 Hours.
PR: WVU sections require CE 332, WVUIT sections require CE 204 and CE 331. Highway administration, economics and finance; planning and design; subgrade soils and drainage; construction and maintenance. Design of a highway. Center line and grade line projections, earthwork and cost estimates.

CE 433. Urban Transportation Planning and Design. 3 Hours.
PR: CE 332. Principles of planning and physical design of transportation systems for different parts of the urban area. Land use, social, economic, and environmental compatibilities emphasized. Evaluation and impact assessment. (3 hr. lec.).

CE 434. Public Transportation. 3 Hours.
PR: CE 332 with a minimum grade of C-. This course introduces research and practice topics related to public transportation. The course aims to provide students with an overview of the evolution and role of public transportation systems. The course will also introduce students to several topics related to planning, design, operations, and evaluation of public transportation systems.

CE 435. Railway Engineering. 3 Hours.
PR: CE 332. Development and importance of the railroad industry. Location, construction, operation, and maintenance. (3 hr. lec.).

CE 436. Pedestrian/Bike Transportation. 3 Hours.
PR: CE 332. Planning, design, operation and maintenance of pedestrian and bicycle facilities, including multi-use trails; policies to encourage non-motorized travel; traffic calming; accessibility and ADA requirements; connections to transit. (3 hr. lec.).

CE 439. Traffic Engineering and Operations. 3 Hours.
PR: CE 332. Driver and vehicular characteristics, horizontal and vertical curve design, traffic flow theory, analysis of traffic engineering data, traffic engineering studies, traffic signal analysis and design.

CE 442. Environmental Aerosol Science. 3 Hours.
PR: CE 347 and CE 347L. This course will give an understanding of the basic principles behind aerosol generation, measurement, mechanics, and toxicity for aerosols found in the environment.

CE 443. Environmental Science and Technology. 3 Hours.
PR: CE 347 and CE 347L. Issues of global atmospheric change, minimization and control of hazardous wastes, groundwater contamination, water pollution, air pollution, solid waste control, and management of water and energy resources.

CE 445. Properties of Air Pollutants. 3 Hours.
PR: CE 347 and CE 347L. Physical, chemical, and biological behavioral properties of dusts, droplets, and gases in the atmosphere. Air pollutant sampling and analysis. Planning and operating air pollution surveys.

CE 447. Environmental Engineering Design. 3 Hours.
PR: CE 347 and CE 347L. Process design of treatment/remediation systems; comparison of alternatives and preliminary cost evaluation.

CE 451. Foundations Engineering. 3 Hours.
PR: CE 351 and CE 351L. Subsurface investigations and synthesis of soil parameters for geotechnical design and analysis, concepts of shallow and deep foundation design, geotechnical design of conventional retaining walls, computerized analysis and design of soil/foundation interaction; case histories.

CE 453. Earthwork Design. 3 Hours.
PR: CE 351 and CE 351L. Use of soil mechanics principles in the analysis, design and construction of earth structures. Principles of compaction and compaction control; an introduction to slope stability analysis and landslides; earth reinforcement systems, and ground improvement techniques.

CE 454. Geotechnical Engineering Field Methods. 3 Hours.
PR: CE 351 and CE 351L. Soil exploration and groundwater sampling; in-situ determination of properties using split spoon, cone, dilatometer, pressure meter, and vane equipment. Instrumentation for monitoring field performance and challenges associated with exploration and monitoring in geotechnical/geoenvironmental engineering.

CE 461. Structural Analysis 2. 3 Hours.
PR: WVU sections require CE 361 and CE 361L, WVUIT sections require MATH 261 and PR or CONC: (CE 462 or CE 463). Fundamental theory of statically indeterminate structures; analysis of indeterminate beams, frames, and trusses by stiffness and flexibility methods; study of influence lines for beams, frames, and trusses.

CE 462. Reinforced Concrete Design. 3 Hours.
PR: WVU sections require CE 361 and CE 361L, WVUIT sections require PR or CONC: CE 361 and CE 361L. Behavior and design of reinforced concrete members. Material properties, design methods and safety consideration, flexure, shear, bond and anchorage, combined flexure and axial load, footings, introduction to torsion slender columns, and pre-stressed concrete.

CE 463. Steel Design. 3 Hours.
PR: CE 361 and CE 361L. Material properties, design of steel bridge and building systems with emphasis on connections, beams, columns, plastic design, and cost estimates.

CE 464. Timber Design. 3 Hours.
PR: CE 361 and CE 361L. Fundamentals of modern timber design and analysis. Topics include wood properties, design of beams, columns, trusses, and other structures using dimension lumber, glue-laminated products and composites.

CE 466. Steel Design 2. 3 Hours.
PR: CE 463 with a minimum grade of C-. Advanced topics in steel design with an emphasis on a comprehensive understanding of system load determination and mechanisms of load transfer framed building and bridge systems along with advanced topics in system analysis and current industry employed software for bridges and buildings.

CE 468. Building Design. 3 Hours.
PR: CE 361 and CE 361L. This course focuses on the fundamentals of building design, investigating the structural behavior under combined gravity and lateral load effects (wind and earthquake) per the requirements of design standards. Lateral load-resisting systems will be studied. Structural analysis and structural design will be performed by hand-calculations and verified by computer modeling. Structural analysis/design software will be utilized for the project exercise.

CE 479. Integrated Civil Engineering Design-Capstone. 3 Hours.
PR: WVU sections require senior standing and CE 301 and CE 321 and CE 332 and CE 347 and CE 351 and CE 361 and a minimum grade of C- in a CE Design Elective, WVUIT sections require senior standing and (CE 411 or CE 431 or CE 432 or CE 451 or CE 452 or CE 453 or CE 462 or CE 463 or CE 464) with a minimum grade of C-. Capstone integration of the civil engineering curriculum by comprehensive design experience to professional standards. Projects are performed in student groups under faculty supervision.

CE 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

CE 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

CE 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CE 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

CE 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

CE 496. Senior Thesis. 1-3 Hours.
PR: Consent.

CE 497. Research. 1-15 Hours.
Independent research projects.

CE 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

CHE 102. Introduction to Chemical Engineering. 3 Hours.
PR: ENGR 101 and PR or CONC: (CHEM 116 or CHEM 118.) Overview of traditional and emerging areas of chemical engineering, projects involving computational and programming tools, design projects, written and oral presentation of results, discussions of professional and ethical behavior relating to the engineering professions.

CHE 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

CHE 201. Material and Energy Balances 1. 3 Hours.
PR: CHEM 116 and MATH 155 (or MATH 153 and MATH 154) and PR or CONC: CHE 102 or ENGR 102. Introduction to chemical engineering fundamentals and calculation procedures, industrial stoichiometry, real gases and vapor-liquid equilibrium, heat capacities and enthalpies, and unsteady material balances and energy balances.

CHE 202. Material and Energy Balances 2. 3 Hours.
PR: CHE 201 and PR or CONC: CHE 230. Continuation of CHE 201.

CHE 221. Material and Energy Balance. 4 Hours.
PR: (MATH 154 or MATH 155) and CHEM 116 and PR or CONC: (CHE 102 or ENGR 102) all with a minimum grade of C- in all. Introduction to the principles of chemical engineering, the methodology for doing chemical engineering calculations and lays the foundation for subsequent courses in thermodynamics, unit operations, kinetics, and process dynamics and control.

CHE 226. Reaction Phenomena. 3 Hours.
PR: CHEM 116 or CHEM 118 with a minimum grade of C-. Theory and application of reaction kinetics, analysis of rate data, reaction equilibrium, and catalysis. The application of these phenomena to industrial relevant systems will be emphasized.

CHE 230. Numerical Methods for Chemical Engineering. 3 Hours.
PR: (CHE 102 or ENGR 102) and MATH 156 and PR or CONC: (CHE 202 or CHE 221) and MATH 251. Numerical solution of algebraic and differential equations with emphasis on process material and energy balances. Statistical methods optimization, and numerical analysis.

CHE 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CHE 310. Process Fluid Mechanics. 3 Hours.
PR: CHE 202 and MATH 251. Fluid statics, laminar and turbulent flow, mechanical energy balance, Bernoulli equation, force balance, friction, flow in pipes, pumps, metering and transportation of fluids, flow through packed beds and fluidized beds.

CHE 311. Process Heat Transfer. 3 Hours.
PR: CHE 202 and MATH 251. Conductive heat transfer, convective heat transfer, design and selection of heat exchange equipment, evaporation, and radiation.

CHE 312. Separation Processes. 3 Hours.
PR: CHE 320. Equilibrium stage and multiple stage operations, differential countercurrent contracting, membrane separations, fluid-particle separations.

CHE 315. Chemical Engineering Transport Analysis. 3 Hours.
PR: CHE 322 and CHE 325 and MATH 261. Development of fundamental relationships for momentum, heat and mass transfer for flow systems to include chemical reactions, interphase transport, and transient phenomena. Development and use of microscopic and macroscopic balance equations.

CHE 320. Chemical Engineering Thermodynamics. 3 Hours.
PR: WVU sections require CHE 202 and CHE 230 and MATH 251, WVUIT sections require CHE 212 and MATH 251. First and second laws of thermodynamics. Thermodynamic functions for real materials. Physical equilibrium concepts and applications.

CHE 321. Chemical Engineering Thermodynamics and Kinetics. 4 Hours.
PR: WVU sections require (CHE 202 or CHE 221) with a minimum grade of C- and CHE 230 and MATH 251), WVUIT sections require (CHE 212 and MATH 251). First and second laws of thermodynamics. Thermodynamic functions for real materials. Physical equilibrium concepts and applications. Rate laws, kinetic data analysis, reaction equilibrium.

CHE 322. Unit Operations 1. 4 Hours.
PR: WVU sections require MATH 251 with a minimum grade of C- and (CHE 202 or CHE 221), WVUIT sections require MATH 251 with a minimum grade of C- and CHE 212. Fluid statics, laminar and turbulent flow, mechanical energy balance, Bernoulli equation, force balance, friction, flow in pipes, pumps, metering and transportation of fluids, flow through packed beds and fluidized beds. Conductive heat transfer and introduction to convective heat transfer.

CHE 323. Unit Operations 2. 4 Hours.
PR: CHE 321 and CHE 322. Convective heat transfer. Heat exchanger operation. Equilibrium stage and multiple stage operations, differential countercurrent contracting, membrane separations, fluid-particle separations.

CHE 325. Chemical Reaction Engineering. 3 Hours.
PR or CONC: WVU sections require CHE 312 or CHE 323, WVUIT sections require CHE 317. Application of material balances, energy balances, chemical equilibrium relations, and chemical kinetic expressions to the design of chemical reactors.

CHE 326. Reaction Phenomena. 3 Hours.
PR: CHE 320 and PR or CONC: CHE 325. Theory and application of reaction kinetics, analysis of rate data, reaction equilibrium, and catalysis. The application of these phenomena to industrial relevant systems will be emphasized.

CHE 351L. Chemical Process Laboratory. 2 Hours.
PR or CONC: (CHE 310 and CHE 311) or CHE 322. Reinforcement of practical concepts acquired during the junior year chemical engineering courses on fluids and heat transfer through experimental design and practice.

CHE 355. Process Simulation and Design. 3 Hours.
PR: CHE 322 and PR or CONC: CHE 323 and CHE 325. The application and use of chemical process simulation software to the design of a chemical process.

CHE 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CHE 412. Advanced Topics in Process Systems Engineering. 3 Hours.
PR: CHE 355. This course will cover fundamental and advanced physics-based and data-driven modeling and optimization techniques for process synthesis, design, and analysis.

CHE 414. Coal Conversion Engineering. 3 Hours.
PR: CHEM 233 and PR or CONC: (CHE 312 or CHE 317) and CHE 325. Coal conversion processes from the unit-operations approach; thermodynamics, kinetics, and evaluation of system requirements and performance. (3 hr. lec.).

CHE 416. Oil & Gas Refining. 3 Hours.
PR: (CHE 311 or CHE 322) and PR or CONC: CHE 312 or CHE 323 or CHE 325. The fundamental principles to analyze refining processes in modern petroleum refineries, chemistry and processes for the conversion of natural gas to products equivalent to those from petroleum.

CHE 418. Unconventional Catalytic Processes for Future Chemical Manufacturing. 3 Hours.
PR: CHE 325 or (CHE 321 or MAE 320). Unconventional catalytic processes and analysis of relevant data. Microwave-enhanced, electrolytic, induction heating, biological processes, etc. Process intensification. CO2 conversion.

CHE 420. Electrochemical Energy Technologies. 3 Hours.
PR: CHE 221 or MAE 320 or MAE 321. This course provides an introduction to the fundamentals and applications of electrochemical energy conversion and storage devices. It covers a range of topics, including solid oxide fuel cells and electrolysis cells, solar cells, rechargeable batteries, and supercapacitors. The course delves into aspects of these technologies such as thermodynamics, kinetics, materials, structures, and challenges associated with them.

CHE 428. Membrane Separations. 3 Hours.
PR: CHE 321 and CHE 323. This course will cover the fundamental physical and chemical principles underlying membrane-based separation processes as well as applications for liquid-phase, gas-phase, and ion-exchange membranes.

CHE 435. Chemical Process Control. 3 Hours.
PR: (CHE 230 or CHE 330) and (CHE 325 or CHE 327). Transient behavior of chemical process flow systems, linearization and stability. Process control system design including frequency response analysis. Instrumentation and hardware.

CHE 450L. Unit Operations Laboratory 1. 2 Hours.
PR: WVU sections require CHE 310 and CHE 311 and CHE 312 and CHE 325 and CHE 351L, WVUIT sections require CHE 317 and CHE 350. Operation of chemical process engineering equipment; collection, analysis, and evaluation of laboratory report preparation.

CHE 451L. Unit Operations Laboratory 2. 2 Hours.
PR: CHE 450L. Continuation of CHE 450L.

CHE 452L. Chemical Engineering Senior Laboratory. 2 Hours.
PR: (CHE 312 or CHE 323) and CHE 325 and CHE 351L and PR or CONC: CHE 452S. Operation of chemical process engineering equipment to illustrate important processes to the practice of chemical engineering with a focus on equipment setup and data collection.

CHE 452S. Chemical Engineering Senior Laboratory Analysis. 1 Hour.
PR or CONC: CHE 452L. In-depth analysis of experimental results from chemical process engineering equipment to illustrate important processes to the practice of chemical engineering with a focus on the application of physical models and statistical evaluation.

CHE 455. Chemical Process Design 1. 3 Hours.
PR: (CHE 312 or CHE 323) and CHE 325 and CHE 355 and PR or CONC: CHE 455S. Analysis, synthesis, and design of chemical process systems. Engineering economics, safety, professional aspects of the practice of chemical engineering. Includes a group chemical plant design project, as well as individual design projects.

CHE 455S. Chemical Process Design 1 Studio. 1 Hour.
PR: (CHE 312 or CHE 323) and CHE 325 and CHE 355 and PR or CONC: CHE 455. Analysis, synthesis, and design of chemical process systems. Engineering economics, safety, professional aspects of the practice of chemical engineering. Includes a group chemical plant design project, as well as individual design projects.

CHE 456S. Chemical Process Design 2. 3 Hours.
PR: CHE 455 and CHE 455S. Continuation of CHE 455S.

CHE 461. Polymer Science and Engineering. 3 Hours.
PR: CHEM 233. Polymer classification, polymer synthesis, molecular weights and experimental techniques, thermodynamics, rubber elasticity, mechanical behavior, crystallization, diffusion, rheology, extrusion and injection molding. (3 hr. lec.).

CHE 462. Polymer Processing. 3 Hours.
PR: Junior standing in engineering and mineral resources. Flow behavior in idealized situations; extrusion; calendaring; coating; injection molding; fiber spinning; film blowing; mixing; heat and mass transfer; flow instabilities. (3 hr. lec.).

CHE 463. Polymer Composites Processing. 3 Hours.
PR: Junior standing in engineering and mineral resources. Advantages and applications of polymer composites; chemistry and kinetics of thermosetting polymers; hand layup and spray up; compression molding; resin transfer molding; reaction injection molding; filament winding; pultrusion. (3 hr. lec.).

CHE 466. Electronic Materials Processing. 3 Hours.
PR: Junior standing in engineering and mineral resources. The design and application of thermal, plasma, and ion assisted processing methodologies; solid state, gas phase, surface, and plasma chemistry underpinnings; thin film nucleation and growth; the effect of processing methods and conditions on mechanical, electrical, and optical properties. (3 hr. lec.).

CHE 471. Biochemical Engineering. 3 Hours.
PR: CHE 325. Kinetics of enzymatic and microbial reactions, interactions between biochemical reactions and transport phenomena, analysis and design of bioreactors, enzyme technology, cell cultures, bioprocess engineering. (3 hr. lec.).

CHE 472. Biochemical Separations. 3 Hours.
PR or CONC: CHE 312 or CHE 317. Modeling and design of separation processes applicable to recovery of biological products. Topics include filtration, centrifugation, extraction, adsorption, chromatography, electrophoresis, membranes, crystallization, and examples from industry. (3 hr. lec.).

CHE 475. Chemical Process Safety. 3 Hours.
PR: (CHE 202 or CHE 221) and (CHE 310 or CHE 322). Introduction to safety, health and loss prevention in the chemical process industry; regulations, toxicology, hazard identification, system safety analysis and safety design techniques.

CHE 476. Pollution Prevention. 3 Hours.
PR or CONC: (CHE 312 or CHE 317) and CHE 325 and CHE 326. Environmental risk and regulations; fate and persistence of chemicals; green chemistry; evaluation and improvement of pollution performance during chemical process design; life cycle analysis; industrial ecology.

CHE 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

CHE 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

CHE 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CHE 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

CHE 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

CHE 496. Senior Thesis. 1-3 Hours.
PR: Consent.

CHE 497. Research. 1-15 Hours.
CHE 497. Research. I,II,S. 1-15 hr. PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. Grading may be S/U.

CHE 498. Honors. 1-3 Hours.
PR: Students in the Honors Program and consent by the honors director. Independent reading, study or research.

CHEM 110. Preparatory Chemistry. 3 Hours.
PR: MATH 122 or above with a minimum grade of C- or appropriate test scores. Required for students whose performance on ACT/SAT/placement examination indicates need for preparatory work before enrolling in other chemistry courses. Elementary scientific terminology and concepts; simple chemical arithmetics; chemical symbols, formulae and equations; and mole concepts.

CHEM 111. Survey of General, Organic, and Biological Chemistry 1. 3 Hours.
PR: (MATH 122 or MATH 124 or MATH 126 with minimum grade of C-) or MATH 129 or higher with a minimum grade of D- or appropriate test scores and PR or CONC: CHEM 111L. Designed primarily for students taking only one year of college chemistry. Atomic structure; chemical bonding; acids, bases, and salts; periodicity; properties of gases, liquids, and solids; stoichiometry; oxidation-reduction.

CHEM 111L. Survey of Chemistry 1 Laboratory. 1 Hour.
PR or CONC: CHEM 111. Survey of Chemistry 1 - CHEM 111 Laboratory.

CHEM 112. Survey of General Organic Biological Chemistry 2. 3 Hours.
PR: WVU and WVUIT sections require CHEM 111 and CHEM 111L with a minimum grade of C- and PR or CONC: CHEM 112L, PSC sections require CHEM 111 and CHEM 111L and PR or CONC: CHEM 112L with a minimum grade of C- in all. Continuation of CHEM 111. Nuclear chemistry; air and water pollution; useful natural materials; consumer chemistry; introduction to organic and biochemistry.

CHEM 112L. Survey of Chemistry 2 Laboratory. 1 Hour.
PR: WVU and WVUIT sections require CHEM 111 and CHEM 111L and PR or CONC: CHEM 112, PSC sections require CHEM 111 and CHEM 111L and PR or CONC: CHEM 112 with a minimum grade of C- in all. Survey of Chemistry 2 - CHEM 112 Laboratory.

CHEM 115. Fundamentals of Chemistry 1. 3 Hours.
PR: Satisfactory ACT/SAT or placement exam performance, or WVU sections require CHEM 110 with a minimum grade of C- or MATH 129 or higher with a minimum grade of C-, PSC sections require MATH 124 or MATH 126 or PR or CONC: MATH 128 or higher with a minimum grade of C-, WVUIT sections require PR or CONC: MATH 126 or MATH 129, and PR or CONC: CHEM 115L. The first semester of a two-semester course of study in the fundamental principles of chemistry upon which subsequent course work is built. Topics include, but are not limited to, atomic and molecular structure, the periodic table and periodicity, chemical stoichiometry, aqueous reactions (precipitation, acid-base, and redox), basic thermochemistry, and properties of gases, liquids, and solids.

CHEM 115L. Fundamentals of Chemistry 1 Laboratory. 1 Hour.
PR or CONC: CHEM 115 with a minimum grade of C-. This course is the laboratory portion of a full year course sequence designed to provide students with a practical understanding of the quantitative applications of fundamental chemical principles and their quantitative application in the laboratory. Students will develop and practice observational skills, perform accurate quantitative measurements, interpret experimental results, perform calculations on these results and draw reasonable, accurate conclusions.

CHEM 116. Fundamentals of Chemistry 2. 3 Hours.
PR: CHEM 115 and CHEM 115L with a minimum grade of C- and PR or CONC: CHEM 116L with a minimum grade of C-. Continuation of CHEM 115 and CHEM 115L.

CHEM 116L. Fundamentals of Chemistry 2 Laboratory. 1 Hour.
PR or CONC: CHEM 116. Fundamentals of Chemistry 2 - CHEM 116 Laboratory.

CHEM 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

CHEM 215. Introductory Analytical Chemistry. 3 Hours.
PR: CHEM 116 and CHEM 116L with a minimum grade of C- in each and PR or CONC: CHEM 215L. Volumetric analysis, gravimetric analysis, solution equilibria, spectrophotometry, separations, and electrochemical methods of analysis. (Students may not receive credit for CHEM 215 and for CHEM 117 and CHEM 118.).

CHEM 215L. Introductory Analytical Chemistry Laboratory. 1 Hour.
PR: CHEM 116 and CHEM 116L with a minimum grade of C- in each and PR or CONC: CHEM 215. Volumetric analysis, gravimetric analysis, solution equilibria, spectrophotometry, separations, and electrochemical methods of analysis.

CHEM 231. Organic Chemistry: Brief Course. 3 Hours.
PR: CHEM 116 and CHEM 116L and PR or CONC: CHEM 231L. Emphasis on biological applications for students in medical technology, agriculture, and family resources. Nomenclature, structure, reactivity, and stereochemistry are stressed. (3 hr. lec., 3 hr. lab.) (Students may not receive credit for CHEM 231 and for CHEM 233 and CHEM 234.).

CHEM 231L. Organic Chemistry: Brief Course Laboratory. 1 Hour.
PR: CHEM 116 and CHEM 116L with a minimum grade of C- and PR or CONC: CHEM 231. Emphasis on biological applications for students in medical technology, agriculture, and family resources. Nomenclature, structure, reactivity, and stereochemistry are stressed.

CHEM 233. Organic Chemistry 1. 3 Hours.
PR: CHEM 116 and CHEM 116L and PR or CONC: CHEM 233L with a minimum grade of C- in all. Basic principles of organic chemistry. Modern structural concepts, the effect of structure on physical and chemical properties, reactions and their mechanisms and application to syntheses.

CHEM 233L. Organic Chemistry 1 Laboratory. 1 Hour.
PR: CHEM 116 and CHEM 116L with a minimum grade of C- in each and PR or CONC: CHEM 233. Fundamental organic reactions and the preparation of organic compounds.

CHEM 234. Organic Chemistry 2. 3 Hours.
PR: CHEM 233 and CHEM 233L and PR or CONC: CHEM 234L with a minimum grade of C- in all. Continuation of CHEM 233 and 233L and the study of basic principles of organic chemistry. Modern structural concepts, the effect of structure on physical and chemical properties, reactions and their mechanisms and application to syntheses.

CHEM 234L. Organic Chemistry 2 Laboratory. 1 Hour.
PR: CHEM 233 and CHEM 233L and PR or CONC: CHEM 234 with a minimum grade of C- in all. Continuation of CHEM 233L and its study of fundamental organic reactions and the preparation of organic compounds.

CHEM 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CHEM 310. Instrumental Analysis. 3 Hours.
PR: CHEM 215 and CHEM 215L with a minimum grade of C-. Fundamental and practical topics integral to instrumental analyses, including classical and cutting-edge instrumental methods.

CHEM 310L. Instrumental Analysis Laboratory. 1 Hour.
PR: WVU sections require PR or CONC: CHEM 310 with a minimum grade of C-, WVUIT sections may have different criteria. An introduction to various scientific instruments in typical analytical laboratories used to record analytical data. Students provided an experience that will prepare them for future work in the in a commercial, academic, or government sector.

CHEM 312. Environmental Chemistry. 3 Hours.
PR: CHEM 215 and CHEM 233 with a minimum grade of C-. Study of the nature, reactions, transport, and fates of chemical species in the environment.

CHEM 322. Inorganic Chemistry 1. 3 Hours.
PR: CHEM 116 and CHEM 233 with minimum grade of C- in each. This course provides an introduction to transition metal chemistry and provides a comprehensive overview of the chemistry of main group elements and compounds. Students learn to apply a qualitative treatment of quantum mechanics to explain periodic trends learned in introductory courses and to classify compounds according to concepts of point group molecular symmetry.

CHEM 335. Methods of Structure Determination. 4 Hours.
PR: CHEM 234 and CHEM 234L with a minimum grade of C- and Coreq: CHEM 335L. Use of chemical methods and UV, IR, and NMR spectroscopy and mass spectrometry to elucidate structures of organic compounds. For students in chemistry and related fields who may need these methods in research and applied science.

CHEM 335L. Methods of Structure Determination Laboratory. 0 Hours.
PR: CHEM 234 and CHEM 234L with a minimum grade of C- and Coreq: CHEM 335. Methods of Structure Determination Laboratory. The CHEM 335L course is the corequisite laboratory course to the CHEM 335 lecture course. The two courses must be taken concurrently.

CHEM 336. Fundamental Concepts in Early Drug Discovery. 3 Hours.
PR: CHEM 234 with a minimum grade of C-. This course develops understanding of the crucial concepts in early drug discovery. Focus will be given to how the chemical features of the drugs affect their interactions with biological systems.

CHEM 339L. Organic Syntheses Laboratory. 3 Hours.
PR: CHEM 234 and (CHEM 234L or CHEM 236) with a minimum grade of C- in each. Modern synthetic methods of organic chemistry.

CHEM 341. Physical Chemistry: Brief Course. 3 Hours.
PR: CHEM 116 and MATH 155 and (PHYS 102 or PHYS 112) and PR or CONC: CHEM 341L. Beginning physical chemistry covering the subjects of chemical thermodynamics, chemical dynamics, and the structure of matter.

CHEM 341L. Physical Chemistry: Brief Course Laboratory. 1 Hour.
PR: CHEM 116 and MATH 155 and (PHYS 102 or PHYS 112) all with a minimum grade of C- and PR or CONC: CHEM 341 with a minimum grade of C-. Designed to develop experimental skills in Physical Chemistry. The primary scientific topics of the course are kinetics, calorimetry, equilibrium, the properties of matter (gases, liquids, and solutions), and phase equilibria.

CHEM 348. Physical Chemistry 2. 3 Hours.
PR: WVU sections require CHEM 341 with a minimum grade of C- and PR or CONC: MATH 156 with a minimum grade of C-, WVUIT sections require CHEM 346 and MATH 251 with a minimum grade of C- in each and PR or CONC: CHEM 348L with a minimum grade of C-. Comprehensive exploration of fundamental thermodynamics and quantum mechanics principles and their applications in chemistry.

CHEM 348L. Physical Chemistry 2 Laboratory. 2 Hours.
PR: (CHEM 341 or CHEM 346) and (CHEM 341L or CHEM 346L or CHEM 347) with a minimum grade of C- in each and PR or CONC: CHEM 348 with a minimum grade of C-. Teaches the techniques, principles, methods and applications of experimental chemical thermodynamics and experimental chemical kinetics.

CHEM 362. Biochemistry 1. 3 Hours.
PR: CHEM 233 and CHEM 233L with a minimum grade of C- in each. In this course, students will focus on the structure and function of the four main types of biomolecules: carbohydrates, lipids, proteins, and nucleic acids.

CHEM 362L. Biochemistry 1 Laboratory. 1 Hour.
PR or CONC: CHEM 362 with a minimum grade of C-. This laboratory familiarizes students with biochemical techniques used to analyze various biological processes within living organisms.

CHEM 376L. Research Methods Laboratory. 3 Hours.
PR: (CHEM 118 or CHEM 215) and PR or CONC: ARSC 220. An introduction to the tools and mathematics that scientists use to solve scientific problems. Mathematical modeling, experimental design, hypothesis formulation, data collection, use of statistics, reading and evaluating the scientific literature, writing and reviewing scientific papers, and oral presentation of scientific research.

CHEM 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CHEM 402. Chemistry Capstone: Chemical Literature. 3 Hours.
PR: CHEM 215 and CHEM 234 and (AGBI 410 or CHEM 322 or CHEM 341) with a minimum grade of C- in all. Study of techniques for locating, utilizing, compiling, and presenting information needed by the research worker in chemistry disciplines.

CHEM 422. Inorganic Chemistry 2. 3 Hours.
PR: WVU sections require CHEM 322 with a minimum grade of C-, WVUIT sections require CHEM 348 with a minimum grade of C-. Inorganic chemistry sits at the crossroads of analytical, physical, and organic chemistry. The material covered in this course takes aspects of each of these chemical disciplines and applies them to inorganic main-group and transition metal compounds.

CHEM 422L. Inorganic Synthesis Laboratory. 2 Hours.
PR: CHEM 322 with a minimum grade of C-. Application of modern synthetic and spectroscopic methods of analysis to the preparation and characterization of main group, solid-state, transition metal, and organometallic compounds.

CHEM 440. Quantum Chemistry. 3 Hours.
PR: CHEM 348. Introduction to the principles of quantum mechanics and its application to atoms, molecules, solids, spectroscopy, and computational chemistry.

CHEM 444. Colloid and Surface Chemistry. 3 Hours.
PR: Physical chemistry. Selected topics in the properties and physical chemistry of systems involving macromolecules, lyophobic colloids, and surfaces. (3 hr. lec.).

CHEM 460. Forensic Chemistry. 3 Hours.
PR: CHEM 215 and CHEM 215L and CHEM 234 and (CHEM 234L or CHEM 236) and PR or CONC: (CHEM 460L or CHEM 463) with a minimum grade of C- in all. Analytical chemistry as applied in forensic science. Drug analysis, toxicology, arson, paints, polymers, fibers, inks, and gunshot residue.

CHEM 460L. Forensic Chemistry Laboratory. 1 Hour.
PR: CHEM 215 and CHEM 215L and CHEM 234 and CHEM 234L and PR or CONC: CHEM 460 with a minimum grade of C- in all. Analytical chemistry as applied in forensic science. Drug analysis, toxicology, arson, paints, polymers, fibers, inks, and gunshot residue.

CHEM 462. Biochemistry 2. 3 Hours.
PR: AGBI 410 and PR or CONC: (CHEM 462L or CHEM 464) with a minimum grade of C- in all. Second semester of undergraduate biochemistry with a focus on the molecular level processes that enable life and the integration of multiple hierarchies of mechanistic regulation.

CHEM 462L. Biochemistry 2 Laboratory. 1 Hour.
PR: AGBI 410 and AGBI 410L and PR or CONC: CHEM 462 with a minimum grade of C- in all. Second semester of undergraduate biochemistry lab, familiarizes students with biochemical techniques used in the analysis of biological species/processes.

CHEM 490. Teaching Practicum: Peer-Led Team Learning. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

CHEM 490A. Teaching Practicum-CLC. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

CHEM 490B. Teaching Practicum - TA. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

CHEM 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

CHEM 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

CHEM 493. Special Topics. 6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CHEM 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

CHEM 496. Senior Thesis. 1-3 Hours.
PR: Consent.

CHEM 497. Research. 1-6 Hours.
Independent research projects.

CHEM 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

CHIN 101. First Year Chinese 1. 3 Hours.
PR: No prior study of the language. Introduction to the sound and writing systems of the language, with emphasis on listening, speaking, reading, and writing within an authentic cultural context. (3 hr. lec.).

CHIN 102. First Year Chinese 2. 3 Hours.
PR: CHIN 101. Continuation of CHIN 101. Continued development of basic skills in listening, speaking, reading, and writing Chinese. (3 hr. lec.).

CHIN 203. Second Year Chinese 1. 3 Hours.
PR: CHIN 102 or equiv. Continuation of CHIN 102. Continued development of basic skills in listening, speaking, reading, and writing Chinese. (3 hr. lec.).

CHIN 204. Second Year Chinese 2. 3 Hours.
PR:CHIN 203 or equiv. Continuation of CHIN 203. Continued development of basic skills in listening, speaking, reading, and writing Chinese.

CHIN 271. Intensive Mandarin Chinese 1. 3 Hours.
PR: CHIN 102 or equivalent. Faculty-led study abroad course. Development of oral and written communication skills in Chinese through classroom activities and outside of class assignments in an authentic cultural environment.

CHIN 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CHIN 301. Third Year Chinese 1. 3 Hours.
PR: CHIN 204. Continued development of oral and written communicative skills in Chinese.

CHIN 302. Third Year Chinese 2. 3 Hours.
PR: CHIN 301. Continued development of oral and written communicative skills in Chinese.

CHIN 303. Readings in Modern Chinese 1. 3 Hours.
PR: CHIN 204. Development of communicative skills, with emphasis on reading modern Chinese texts.

CHIN 304. Readings in Modern Chinese 2. 3 Hours.
PR: CHIN 303. Development of communicative skills, with emphasis on reading modern Chinese texts.

CHIN 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CHIN 461. Business Chinese. 3 Hours.
PR: CHIN 302 or CHIN 304. Advanced training in vocabulary, sentence structures, and rhetoric in business Chinese.

CHIN 465. Chinese Media. 3 Hours.
PR: CHIN 302 or CHIN 304. Advanced training in vocabulary, sentence structure, and rhetoric of Chinese media.

CHIN 471. Intensive Mandarin Chinese 2. 3 Hours.
PR: CHIN 204 or equivalent. Faculty-led study abroad course. Development of advanced oral and written communication skills through classroom activities and outside of class assignments, including interaction with native speakers in an authentic cultural environment.

CHIN 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

CHIN 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

CHIN 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CHIN 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

CHIN 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

CHIN 496. Senior Thesis. 1-3 Hours.
PR: Consent.

CHIN 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

CHPR 170. Health of the Individual. 3 Hours.
Examines personal health-related problems in terms of information, services, and actions, as they relate to attainment and maintenance of individual health.

CHPR 210. First-Aid Teaching Practicum. 3 Hours.
This class prepares students to conduct a first-aid course. Students work with the instructor in all aspects of course management. Students who complete this course are eligible to apply for instructor candidate training with the American Red Cross.

CHPR 260. Introduction to Peer Health Education. 3 Hours.
Prepares students to become peer health educators through the study of health concerns of students in higher education and examination of effective teaching strategies that result in positive health outcomes.

CHPR 261. Advanced Peer Health Education. 3 Hours.
Students apply a variety of teaching strategies based on the peer concept to health concerns of college students and other young adults.

CHPR 265. HIV/STD Prevention: Global Challenge. 3 Hours.
Addresses personal, social, legal, medical, and cultural aspects of HIV and sexually transmitted diseases and the health education efforts to stem the pandemic.

CHPR 270. Alcohol/Drug Education for Athletes. 3 Hours.
Chemical use and dependency has a significant impact on people in all walks of life. An overview of chemical dependency and current prevention and intervention is presented.

CHPR 275. Substance Abuse: Student Leaders. 3 Hours.
Provides individuals, particularly those in organizational leadership roles, with an understanding of substance abuse, leadership roles, and decision-making skills for organizations.

CHPR 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CHPR 320. Drug and Alcohol Abuse Prevention. 3 Hours.
Experiences designed to prevent the development of abusive drug-taking relationships by focusing on psychological variables such as self-esteem, coping skills, and development of support networks.

CHPR 331. Accident Prevention and Control Principles. 3 Hours.
Basic course which structures principles, concepts, and methodology of the safety movement into introductory experiences dealing with accident prevention and control efforts recommended for various social institutions and agencies.

CHPR 332. Safety Education Principles and Content. 3 Hours.
PR: CHPR 331 or consent. Study and analysis of content areas usually recommended for instructional programs within the field of safety, with emphasis on structured learning experiences.

CHPR 333. Foundations of Wellness. 3 Hours.
Provide students with physical, mental, emotional, and environmental health concepts and experiences that will expand their knowledge and skills. These relate to the processes and techniques for promoting and maintaining individual and community health changes.

CHPR 365. Men's Health. 3 Hours.
Optimal health is a theme for men across the lifespan. This course will address men's health specific to race, ethnicity and orientation, to provide skills to be an informed consumer of health information.

CHPR 375. Physical Lifestyle Management. 3 Hours.
This course will provide an experience conducive to the understanding, exploration, experience, and development of scientifically sound physical health behaviors within the framework of the Transtheoretical Model of Health Behavior.

CHPR 376. Mental Lifestyle Management. 3 Hours.
This course will provide experience conducive to the understanding, exploration, and development of mental, emotional, and spiritual health processes that comprise and support personal holistic health.

CHPR 380. Women and Health. 3 Hours.
Examination of theories, myths, and practices surrounding women's physical and mental health from both historical and present-day perspectives. Exploration of specific health issues and controversies and the rise of the women's health movement.

CHPR 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

CHPR 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

CHPR 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CHPR 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

CHPR 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

CHPR 496. Senior Thesis. 1-3 Hours.
PR: Consent.

CHPR 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

CLAS 250. Language for Health Professions. 3 Hours.
Teaches the various connections between medical terms and the grammatical structures of Latin and ancient Greek. Focus is on showing students the systematic ways in which the English language has borrowed from Ancient languages to develop its medical vocabulary.

CLAS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CLAS 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

CLAS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

CLAS 492. Directed Study. 1-3 Hours.
Directed study, reading and/or research.

CLAS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CLAS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

CLAS 496. Senior Thesis. 1-3 Hours.
PR: Consent.

CLAS 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

COMM 102. Fundamentals of Interpersonal Communication. 3 Hours.
Emphasizes identification, definition, and application of the appropriate and effective interpersonal communication behaviors and skills needed for the development, maintenance, and termination of relationships with romantic partners, friends, family members, group members, superiors, and coworkers.

COMM 103. Fundamentals of Presentational Speaking. 3 Hours.
Applies communication theory and practice to the public speaking context, with a focus on audience analysis, speaker delivery, communication ethics, cultural diversity, and organizational techniques. Emphasizes development of extemporaneous speaking and speech evaluation skills across a variety of public speaking audiences and contexts.

COMM 104. Fundamentals of Public Communication. 3 Hours.
Explores the context of public communication through the rhetorical canons of invention, arrangement, style, delivery, and memory. Emphasizes the listening, critical thinking, logical reasoning, and ethical skills necessary for the creation, delivery, and interpretation of appropriate and effective persuasive appeals.

COMM 105. Fundamentals of Mediated Communication. 3 Hours.
Examines both the theoretical and practical implications of synchronous and asynchronous communication technologies on interpersonal relationships. Explores the social, cultural, and political effects of emerging mediated communication technologies within and across communication contexts.

COMM 112. Fundamentals of Group Communication. 3 Hours.
Examines the task and relational components associated with group member socialization, role acquisition, and leadership development. Emphasizes development of problem-solving, decision-making, listening, and conflict resolution skills necessary for effective group work.

COMM 122. Fundamentals of Communication in Contemporary Society. 3 Hours.
Introduces and explores the characteristics and properties that constitute intrapersonal, interpersonal, organizational, health, political, and mediated communication contexts. Focuses on the unique communicative problems, challenges, and issues experienced by relational participants in these contexts.

COMM 173. Fundamentals of Communication Studies. 3 Hours.
Surveys the historical and interrelated nature of central skills and topics across the cornerstones of everyday communication including interpersonal, mediated, organizational, and health communication.

COMM 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

COMM 200. Communication Theory and Research 1. 3 Hours.
PR: Pre-communication studies major. Methods of understanding human communication behavior; issues relating to epistemology and ontology in communication studies; and reviews/critiques of the major approaches and theories of human communication.

COMM 201. Communication Research Methods. 3 Hours.
Introduces and examines the components and processes associated with quantitative and qualitative communication research methods. Emphasizes the development of research skills necessary to interpret and design basic communication research.

COMM 203. Communication Theory. 3 Hours.
Introduces and examines the major approaches and theories of communication, including interpersonal, organizational, health, and mediated communication theories. Reviews the history, traditions, and paradigms of theory development in the communication discipline.

COMM 205. Appreciation of the Motion Picture. 3 Hours.
Introduces students to motion picture analysis so that they can appreciate how film, television, and motion pictures on social media engage audiences and communicate meaning. Draws from historical, film studies, critical, cultural, and psychological perspectives to provide a basic but holistic understanding of how motion pictures are produced, and how their production both reflects and influences society.

COMM 212. Gender Communication. 3 Hours.
Examines theoretical approaches to gender development through the interplay of communication, gender, and culture across interpersonal, organizational, cultural, and mediated contexts. Empowers the development of informed decision making in terms of enacting gender, addressing contemporary gender issues, and contributing to societal attitudes, policies, and perspectives regarding gender.

COMM 270. Effective Public Speaking. 3 Hours.
PR: Corequisite of COMM 270S. Designed for improvement of the student's speech based upon theory and demonstrated performance of voice and diction skills and public-speaking skills for effective communication in a variety of speaking situations.

COMM 270S. Effective Public Speaking Studio. 0 Hours.
PR: Corequisite of COMM 270. This studio course is designed for improvement of the student's speech based upon theory and demonstrated performance of voice and diction skills and public-speaking skills for effective communication in a variety of speaking situations.

COMM 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

COMM 300. Interpersonal Communication Theory. 3 Hours.
Provides an overview of communication theory in the social science context, including the characteristics that constitute a high quality theory and criteria for evaluating theories. Covers a variety of foundational and contemporary interpersonal communication theories, models, frameworks, and perspectives.

COMM 302. Interpersonal Communication. 3 Hours.
Focuses on the foundational and contemporary communication concepts, constructs, and theories that influence the development, maintenance, repair, and termination of personal relationships. Explores both the positive and the negative outcomes associated with functional personal relationships.

COMM 303. Business and Professional Communication. 3 Hours.
Applies effective communication strategies in various professional contexts within an organization. Explores and evaluates the use of presentational skills and simulated individual and group exercises geared toward attaining and growing with a career.

COMM 304. Argumentation. 3 Hours.
Emphasizes application and evaluation of argument structure needed for effective reasoning, critical thinking, and persuasion across audiences and situations. Focuses on the development of skills necessary for building, presenting, and refuting arguments.

COMM 306. Organizational Communication. 3 Hours.
Explores fundamental organizational communication perspectives, theories, and concepts in a wide range of contexts, with a focus on translating theories and concepts into organizational practices. Addresses appropriate and effective communication strategies to solve contemporary organizational issues.

COMM 307. Life-Span Communication. 3 Hours.
Focuses on communication from childhood through young adulthood. Emphasizes verbal and nonverbal communication acquisition along with identifying problems and issues associated with the development of communication competence.

COMM 308. Nonverbal Communication. 3 Hours.
Examines the effects of nonverbal behavior on interpersonal and organizational relationships as well as environmental contexts. Explores specific nonverbal codes such as touch, space, time, scent, body movement, and personal appearance, among others.

COMM 309. Health Communication. 3 Hours.
Examines the interdependency of communication and health in a pluralistic and multicultural society across communication contexts. Explores and applies communication theory, research, and practice relevant to the shaping and changing of health beliefs, behaviors, and outcomes.

COMM 315. American Diversity in Film. 3 Hours.
Explores films that illustrate the diversity of individuals who live in the United States of America. Emphasizes films with characters of varying ages, ethnicity, gender, sexual orientation, race, religion, region, and social class.

COMM 316. Intercultural Communication. 3 Hours.
Examines similarities and differences between cultures with regard to norms, values, and practices in verbal and nonverbal communication. Explores the way in which cultures differ from one another in terms of personal, contextual, and environmental variables.

COMM 317. Communication and Aging. 3 Hours.
Focuses on communication with and surrounding older adults, demonstrating the reciprocal relationship between (un)healthy aging and communication. Prioritizes theory-based skills that span interpersonal, intergroup, family, health, and mediated realms.

COMM 322. Dark Side of Communication. 3 Hours.
Explores the negative aspects of close (romantic) relationships, with a focus on relational transgressions or violations of implicit or explicit rules for appropriate relational behavior. Emphasizes the communicative, cognitive, emotional, and behavioral antecedents and consequences of rule violations in personal relationships.

COMM 332. Family Communication. 3 Hours.
Illuminates the power of family communication by uncovering within-family communication trends and their links to individual family member and collective family wellbeing. Addresses mediated and social discourse surrounding families and family life.

COMM 335. Social Media in the Workplace. 3 Hours.
Focuses on the strategic use of social media and communication technology to propose, create, disseminate, and evaluate messages that are intended to accomplish professional and organizational objectives. Emphasizes group collaboration skills.

COMM 342. Interpersonal Relationships & Technology. 3 Hours.
Examines interpersonal communication in mediated contexts. Emphasizes the uses, functions, and effects of social media and communication technologies in relationships with romantic partners, friends, and family members.

COMM 352. Positive Side of Communication. 3 Hours.
Explores the positive aspects of interpersonal relationships, with a focus on those communication behaviors that result in functional, productive, and satisfying relationships. Emphasizes the cognitive, emotional, and behavioral outcomes associated with the practice of positive communication.

COMM 393. Special Topics. 1-6 Hours.
COMM 393. Special Topics. 1-6 HR. PR: Consent. Investigation of topics not covered in regularly scheduled courses.

COMM 401. Advanced Communication Research Methods. 3 Hours.
PR: COMM 201 with a minimum grade of C-. Competency-based approach to the practical and applied use of quantitative communication research methods. Provides hands-on experience with research design; data collection, analysis, and interpretation; and report writing to test communication hypotheses, answer communication questions, and solve communication problems.

COMM 403. Capstone Seminar. 3 Hours.
PR: Senior status and completion of 24 hours of communication studies coursework or consent. Explores communication knowledge and skills attained throughout the college experience for the purpose of transitioning to workplace contexts, job attainment, and career pursuits. Utilizes a breadth and depth of communication theories, topics, and strategies designed for personal and professional success following graduation.

COMM 404. Persuasion. 3 Hours.
Examines the communicative processes of persuasion, compliance, and social influence and their ability to change, reinforce, or shape attitudes, beliefs, and behaviors. Evaluates informal and formal persuasive messages with a focus on the critical consumption and evaluation of successful and unsuccessful persuasive communication across various communicative channels. This course is not open to first-year students.

COMM 405. Effects of Mediated Communication. 3 Hours.
Applies social science research methods and theories to the study of mediated communication. Examines the influence of mediated communication on individuals' beliefs, attitudes, and behaviors across relational contexts.

COMM 406. Advanced Organizational Communication. 3 Hours.
Focuses on investigating traditional and contemporary issues and problems associated with organizations from a critical perspective. Explores the functions and importance of communication for empowerment and social justice across a wide range of organizational settings.

COMM 408. Advanced Nonverbal Communication. 3 Hours.
PR: COMM 308 with minimum grade of C-. Takes a functional approach to the study of nonverbal messages and behaviors. Emphasizes the role that nonverbal codes play in encoding and decoding relational messages across in-person and mediated communication contexts.

COMM 409. Advanced Health Communication. 3 Hours.
Applies health communication research, theory, and practice to the planning, development, and evaluation of strategic health communication messaging, programming, and campaigning. Focuses on public communication campaign design and analysis to evaluate and develop communication campaigns addressing public and community health issues, policies, or practices via diverse and contemporary communication channels.

COMM 416. International Culture and Communication. 3 Hours.
This course provides a hands-on study of the influence of culture on verbal and nonverbal communication, and of the influence of cultural communication norms on conflict and intercultural relations. The course is conducted in the context of a faculty led study abroad experience.

COMM 424. Communication Ethics. 3 Hours.
Examines the principles, frameworks, and guidelines used to recognize, identify, and evaluate ethical issues and tensions inherent in communication relationships. Emphasizes the challenges and benefits associated with practicing ethics within and across communication and relational contexts.

COMM 425. Computer Mediated Communication. 3 Hours.
Addresses the practical and theoretical issues associated with computer-mediated communication. Explores the purposes, functions, and practices of contemporary communication technologies, with an emphasis on the role these technologies play in interpersonal, organizational, and institutional relationships.

COMM 426. Organizational Culture. 3 Hours.
Examines the communicative processes through which organizations and its members create, maintain, and transform workplace culture. Emphasizes the role that organizational artifacts, values, and assumptions play in both organizational insider and outsider assessment and interpretation of an organization's culture.

COMM 435. Advanced Social Media. 3 Hours.
Examines the influence of communication processes on social media and the ways in which social media can both positively and negatively affect individuals, groups, and society. Investigates contemporary issues and problems associated with the development, implementation, and use of social media and web-based technologies.

COMM 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

COMM 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 Hr.) Prearranged experimental learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

COMM 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

COMM 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

COMM 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

COMM 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

COMM 496. Senior Thesis. 1-3 Hours.
PR: Consent.

COMM 497. Research. 1-6 Hours.
Independent research projects.

COMM 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

COUN 140. Recovery Allyship and Advocacy. 1 Hour.
Introduction to the theories, concepts, and skills for allyship with people with addiction and in recovery, and advocacy for policies supportive of prevention, intervention, and recovery of substance use disorder at the community, state, and national levels.

COUN 201. Foundations of Mental Health Intervention. 3 Hours.
Introduction to mental health and mental disorders, including substance use and substance use disorders, and associated interventions across the lifespan. Emphasis on the evolution and composition of the modern mental health system with a survey of interventions from prevention to psychopharmacology.

COUN 230. Life Choices. 3 Hours.
Students will examine lifestyle choices typically dictated by unconscious customs rather than research. Covers areas of attitude, relationships, physical lifestyle, health and spirituality. The class consists of lectures and required student participation.

COUN 240. Introduction to Addiction Studies. 3 Hours.
Overview of core concepts related to substance use and substance use disorders. Topics include the history of drug use/addiction, effects on societal members, pharmacology of common psychoactive drugs, theories of addiction, treatment approaches, mutual support, recovery and relapse.

COUN 301. Interpersonal Communication Skills. 3 Hours.
Overview of interpersonal communication skills, including how these skills affect individuals and groups in society. Emphasis on personal and interpersonal strategies for understanding, appreciating, and managing communication in personal and career relationships. Attention is given to the nature of communication, verbal and non-verbal communication, interpersonal relationships, and leadership skills.

COUN 303. Introduction to Helping Professions. 3 Hours.
To assist in evaluating students potential for a career in the helping professions. Exposure is provided to client populations served by helping professionals, along with a selection of intervention strategies used in those professions.

COUN 305. Wellness and Self-Care. 1 Hour.
This course provides undergraduates with an opportunity to establish self-care practices. Students engage in mindfulness meditation and explore the role of nutrition, exercise, and sleep in mood and stress.

COUN 320. Prevention in Mental Health. 3 Hours.
Overview of core concepts related to the prevention of mental illness and addiction. Topics include the evolution of prevention practices, risk and preventive factors, psychosocial and environmental determinants, selecting and evaluating evidence-based models, and health equity.

COUN 330. Addiction Screening & Assessment. 3 Hours.
PR: COUN 240 with a minimum grade of C-. Skills, techniques and tools necessary for preliminary and in-depth evaluation for the presence of substance use disorders. Emphasis on establishing rapport, interviewing skills, diagnostic criteria, recognition of common co-occurring disorders, treatment planning and clinical writing.

COUN 340. Counseling Techniques. 3 Hours.
PR: COUN 240 with a minimum grade of C-. Overview of basic individual and group helping skills with a focus on the helping relationship, therapeutic dialogue, the stages and tasks of helping, and motivational techniques. Introduction to behavioral addictions and their connection to substance use disorders. Exploration of personal characteristics essential to working in mental health and addiction settings.

COUN 350. Families & Addiction. 3 Hours.
PR: COUN 240 with a minimum grade of C-. Overview of the impact addiction has on the family unit and the process of family recovery. Emphasis on the family as a system, attachment, adaptation, enabling and enmeshment, and techniques to support family healing.

COUN 400. Diversity and Human Relations. 3 Hours.
Overview of diversity and relationships. Examination of genetic/cultural diversity. Attention to problems related to diversity in a changing world.

COUN 405. Career and Lifespan Development. 3 Hours.
Overview of lifespan career development theories, including impact of personal growth and life stages. Emphasis on understanding job choices and personal strategies for career decision making.

COUN 415. Human Services Capstone Experience. 3 Hours.
PR: COUN 301 and COUN 303 and COUN 400 and COUN 405. Field experience in Human Services designed to expose students to the work involved in the human services field(s).

COUN 440. Addiction Studies Capstone. 3 Hours.
PR: COUN 240 and COUN 250 and COUN 340 and PR or CONC: COUN 350 with a minimum grade of C- in each. Integration of addiction studies coursework through study of ethics, selected population research, and community-based service learning, culminating in a research paper and oral presentation.

COUN 455. Ethics in Mental Health and Addiction Settings. 3 Hours.
PR: COUN 201 and COUN 240 with a minimum grade of C- in each and senior standing. Professional helpers face ethical dilemmas on a regular basis. This course prepares students with foundational knowledge necessary for understanding the complexity and ambiguity of ethical dilemmas while exploring critical thinking and ethical decision-making. The course surveys the codes of ethics from a variety of helping professions including human services, counseling, and addictions.

COUN 483. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483A. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483B. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483C. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483D. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483E. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483F. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483G. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483H. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483I. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483J. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483K. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483L. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483M. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483N. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483O. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483P. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483Q. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483R. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483S. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483T. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483U. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483V. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483W. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483X. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483Y. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 483Z. Workshop in Counseling and Guidance. 1-12 Hours.
PR: Consent. To take care of credits for special workshops and short intensive limit courses on methods, supervision, and other special topics.

COUN 485. Capstone in Mental Health and Addiction Studies. 3 Hours.
PR: Senior standing. Integration of MHAS coursework through study of ethics, selected population research, and field experience, culminating in a research paper and oral presentation.

COUN 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

COUN 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

COUN 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

COUN 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

COUN 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

CPE 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

CPE 271. Introduction to Digital Logic Design. 3 Hours.
PR: MATH 156. Introduction to the design of digital systems. Topics include number systems, coding, Boolean and switching algebra, minimization of logic, analysis and design of combinational and sequential logic circuits.

CPE 271L. Digital Logic Laboratory. 1 Hour.
PR or CONC: CPE 271. Experiments with digital electronic circuits including number systems, design and application of modern digital circuitry for both combinational and sequential logic circuits.

CPE 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CPE 310. Microprocessor Systems. 3 Hours.
PR: CPE 271 and CPE 271L and CS 110. Theory and design of microprocessors: organization and architecture of modern processors; integration of microprocessors with RAM, ROM, and I/O devices; machine language, assembly language and software development.

CPE 310L. Microprocessor Systems Laboratory. 1 Hour.
PR or CONC: CPE 310. Machine language, assembly language and hardware and software interfacing. (This includes editing, linking, and debugging.) Memory, I/O and basic techniques of microprocessor interfacing.

CPE 312L. Microcomputer Structures and Interfacing Laboratory. 1 Hour.
PR: CPE 310 and CPE 310L and PR or CONC: CPE 312. A microprocessor based single-board computer is designed and built. A semester project is required using standard I/O techniques.

CPE 410S. Microcomputer Structures and Interfacing. 3 Hours.
PR: CPE 310 and CPE 310L and EE 251 and EE 251L and PR or CONC: CS 350. Design of computer systems with emphasis on interface hardware including communications, high power interface devices, line driver/receiver circuits, A/D and D/A devices, and utilization of software techniques for programmed, interrupt, and direct memory access.

CPE 412. Mobile Robotics. 3 Hours.
Introduction to fundamental topics in Mobile robotics; methods of locomotion; common mobile robot sensors, state estimation and navigation algorithms; path planning and obstacle avoidance methods; robot decision making and control processes; and mobile robot systems design.

CPE 420. Introduction to Neural Networks. 3 Hours.
PR: CS 110 and CS 110 with a minimum grade of C- in each and STAT 215. Fundamental topics in neural networks. Introduction to principles and algorithms used in the design and implementation of supervised and unsupervised neural networks.

CPE 442. Introduction to Digital Computer Architecture. 3 Hours.
PR: WVU sections require CPE 310, WVUIT sections require CPE 320 and PR or CONC: CS 450. Control, data, and demand-driven computer architecture; parallel processing, pipelining, and vector processing; structures and algorithms for array processors, systolic architectures, design of architectures.

CPE 453. Data and Computer Communications. 3 Hours.
PR: WVU sections require CS 350, WVUIT sections require CS 355. An in-depth study of the Internet, networking fundamentals, protocols, algorithms, and principles of distributed computing, introduction to network security and management.

CPE 462. Wireless Networking. 3 Hours.
PR: WVU sections require STAT 215, WVUIT sections require MATH 448. Design and analysis of modern wireless data networks. Channel capacity, noise, antennas, dB units, wireless propagation, signal-to-noise ratio, signal-to-interference ratio. Role of interference and how to manage it through the cellular concept, cell sectorization, and fractional-frequency reuse.

CPE 480. Capstone Project - Design. 2 Hours.
PR: ENGL 102 or ENGL 103. Penultimate semester group senior design projects with individual design assignments appropriate to student's discipline. Complete system-level designs of the subsequent semester's project presented in written proposals and oral presentations. (Equivalent to BIOM 480, CS 480, and EE 480).

CPE 481. Capstone Project - Implementation. 3 Hours.
PR: CPE 480. Continuation of CPE 480. Detailed design and implementation of the system including choice of components, algorithm development, interfacing troubleshooting, working in groups, and project management. Also covers professional topics, including ethics, liability, safety, socio-legal issues, risks and employment agreements.

CPE 484. Real-Time Systems Development. 3 Hours.
PR: CS 350. This course provides an analytic approach to real-time systems development. The class will focus on Dependability Requirements, Classification of Real-Time Systems, Clock Synchronization, Real-Time System Software / RTOSs, Scheduling, and System Design. This course will present concepts related to highly embedded hard real-time systems such as automobiles.

CPE 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

CPE 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

CPE 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CPE 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

CPE 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

CPE 496. Senior Thesis. 1-3 Hours.
PR: Consent.

CPE 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

CRIM 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

CRIM 232. Criminology. 3 Hours.
PR: SOC 101. Exploration of various theories of criminal behavior; emphasis on a critical study of the criminal justice system and efforts to reform the penal system.

CRIM 234. The Criminal Justice System. 3 Hours.
PR: SOC 101. A sociological introduction to the justice system. Focuses on analysis of police work, court activities, and correction within the context of American social organization and societal definitions of crime and justice.

CRIM 302. Deviant Behavior. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101) or consent. Examination of the processes by which deviance is defined in society, and the methods of social control attempted. Provides a critical understanding of society from the perspective of those defined as outsiders-criminals, addicts, etc.

CRIM 303. Juvenile Delinquency. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101) or consent. Nature, extent, and causal explanation of forms of juvenile delinquency. The nature of juvenile courts, the correctional systems, and prevention programs. Emphasizes current issues.

CRIM 318. Hate Crime. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101) or consent. Builds on basic knowledge in sociology to provide a detailed example of an emerging social problem, i.e., hate crime. Explores the ways social phenomena become social problems. Examines the causes and consequences of hate crime.

CRIM 319. Police Culture and Socialization. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). Examines the institution of policing in the United States. Builds on basic sociological concepts to provide a sociological and historical perspective on the formal and informal structures and processes in the American system of policing.

CRIM 321. Punishment and Social Control. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). Builds on basic sociological concepts to provide detailed knowledge about the use of prisons and incarceration among other forms of punishment and surveillance in contemporary society.

CRIM 324. Gender and Crime. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). Builds on basic sociological principles and concepts, and focuses on issues of social structure and process that are at the intersection of gender crime, and crime control.

CRIM 334. Corporate and White Collar Crime. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). Examines law-breaking by respectable organizations and individuals engaged in professional economic activity. Studies sociocultural sources of such crime, consequences for victims, and public policy responses. Includes recent criminal cases, legal changes, and enforcement trends.

CRIM 345. Terrorism. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). A sociological understanding of terrorism, including its causes, relations to social context, and trends. Emphasis is placed on major terrorist groups, selected cases, explanatory theories and policies of containment and prevention.

CRIM 346. Victimology. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). Introduction to the sociological study of victimization, which includes an examination of risks and frequencies, perceptions and fears, and the social and psychological impact of crime, accident and illness on individuals and their societies.

CRIM 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CRIM 415. Mass Media, Crime and Deviance. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). Critically examines how mass media and popular culture depict crime and deviance, and explores how these depictions influence social policies. Focuses especially on portrayals involving race, gender, class and ethnicity in particular historical contexts.

CRIM 431. Cybercrime. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). Examines the legal, social, and technical impacts of illegal activities facilitated through the use of computers or other technology devices. Focus is on these activities as a criminological phenomenon.

CRIM 432. Drugs, Crime, and Society. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). Examines the relationships between drugs and society from both micro and macro perspectives, including the effects of drug use and abuse in everyday life and government intervention efforts.

CRIM 433. Inside Out Prison Exchange. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101) and consent. Experiential program which brings together students and incarcerated men or women inside prison to exchange ideas about criminal justice processes, analyze a designated concern, and produce recommendations for improvement.

CRIM 435. Criminal Justice Process. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). A sociological introduction to the formal and informal processes in the American criminal justice system that affect the investigation and prosecution of criminal cases, including the collection, analysis, and presentation of evidence.

CRIM 444. Neighborhoods and Crime. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). This course introduces students to the growing sociological literature on neighborhoods and crime, with an emphasis on issues related to the race/ethnicity and economic inequality.

CRIM 461. Issues in Crime and Justice. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). Senior seminar on crime and social organization of justice. Focus on problems of prevention, enforcement, corrections and institutional reform. Emphasis on recent research, emerging trends, and policy.

CRIM 464. Rural Criminology. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). The sociological study of crime and social control in rural communities. Focuses on theories and empirical research on rural and small-town crime, and implications for preventing and controlling crime in rural areas.

CRIM 478. Violence Against Women. 3 Hours.
PR: CRIM 232 and CRIM 234. Introduction of sociological studies of violence against women in intimate relationships. Examination of definitions, theories, and the latest empirical findings on a broad range of issues related to male-to-female psychological, physical, and sexual assaults. Exploration of progressive ways of preventing and controlling violence against women in private places.

CRIM 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

CRIM 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

CRIM 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CRIM 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

CRIM 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

CRIM 497. Research. 1-6 Hours.
Independent research projects.

CS 101. Intro to Computer Applications. 4 Hours.
Introduction to spreadsheets and databases for problem-solving in disciplines such as math, science, engineering, business, social sciences, behavioral sciences, and environment: using computer applications to create technical reports and presentations.

CS 110. Introduction to Computer Science. 3 Hours.
PR: (MATH 124 or MATH 126 or MATH 128 or PR or CONC: MATH 129 or MATH 150) with a minimum grade of C- in each or meets the entry requirements of MATH 129 and PR or CONC: CS 110L. Programming and design; simple data types, variables, and expressions; program modularization through procedures, functions, and classes; repetition, selection through control structures; structured data types including arrays and records; application.

CS 110L. Introduction to Computer Science Laboratory. 1 Hour.
PR: (MATH 124 or MATH 126 or MATH 128 or PR or CONC: MATH 129 or MATH 150) with a minimum grade of C- in each or meets the entry requirements of MATH 129 and PR or CONC: CS 110. Laboratory for CS 110.

CS 111. Introduction to Data Structures. 3 Hours.
PR: CS 110 and CS 110L with a minimum grade of C- and PR or CONC: CS 111L. Software development with abstract data types; elementary data structures including lists, stacks, queues and binary trees. Object-oriented design and development, dynamic allocation, recursion, design methodology.

CS 111L. Introduction to Data Structures Laboratory. 1 Hour.
PR: CS 110 and CS 110L with a minimum grade of C- and PR or CONC: CS 111. Laboratory for CS 111.

CS 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

CS 210. File and Data Structures. 4 Hours.
PR: CS 111 and CS 111L with a minimum grade of C-. Complex internal data structures including hashing, record collision and overflow techniques. Extension of internal data structures to external storage; indexed structures, external sorting and merging, direct access methods.

CS 220. Discrete Mathematics. 3 Hours.
PR: WVU sections require CS 110 and CS 110L with a minimum grade of C- and (MATH 154 or MATH 155), WVUIT sections require CS 122 and MATH 155. Mathematical concepts used in computer science such as sets, relations, functions, counting principles, graphs, trees, and automata; introduction to basic graph algorithms and applications.

CS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CS 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

CS 310. Principles of Programming Languages. 3 Hours.
PR: WVU sections require CS 111 and CS 111L with a minimum grade of C-, WVUIT sections require CS 201. Theoretical and practical aspects of languages including internal representations, run-time environments, run-time storage management; historical, current, special purpose and experimental languages; finite-state automata, regular expressions and context-free grammars, language translation, semantics and paradigms.

CS 320. Analysis of Algorithms. 3 Hours.
PR: WVU sections require CS 111 and CS 111L with a minimum grade of C- in each and MATH 156 and (CS 220 or MATH 303), WVUIT sections require CS 201 and CS 220 and MATH 156 with a minimum grade of C- in each. Introduction to algorithm design and analysis. Growth rate of functions and asymptotic notation. Divide-and-conquer algorithms and recurrences; searching and sorting; graph algorithms including graph searching, minimum spanning trees, and shortest paths.

CS 330. Introduction to Software Engineering. 3 Hours.
PR: CS 111 and CS 111L with a minimum grade of C- and PR or CONC: CS 330L. Techniques and methodologies of software engineering; specification, modeling, requirement analysis and definition, design, quality assurance, testing, reuse, development tools and environments.

CS 330L. Introduction to Software Engineering Laboratory. 1 Hour.
PR: CS 111 and CS 111L with a minimum grade of C- and PR or CONC: CS 330. Laboratory for CS 330.

CS 350. Computer System Concepts. 3 Hours.
PR: CS 111 and CS 111L with a minimum grade of C-. System software organization; operating system concepts including processes, threads, memory management, and the user interface; elementary network concepts.

CS 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CS 410. Compiler Construction. 3 Hours.
PR: CS 310. Theory and practice of the construction of programming language translators; scanning and parsing techniques, semantic processing, runtime storage organization, and code generation; design and implementation of interpreter or compiler by students.

CS 420. Design of Algorithms. 3 Hours.
PR: CS 320. Algorithm design paradigms: divide-and-conquer, dynamic programming, greedy. Advanced data structures: balanced search trees, mergeable heaps, union-find. Introduction to computational complexity. Selected topics such as backtracking, branch-and-bound, amortized analysis, approximation algorithms.

CS 422. Automata Theory. 3 Hours.
PR: CS 220. Introduction to formal languages, grammars, and automata; regular expressions and finite automata, context- free and context-sensitive languages; push down and linear- bounded automata; Turing machines and recursively enumerable languages.

CS 426. Discrete Mathematics 2. 3 Hours.
PR: CS 320. Applications of discrete mathematics to computer science. Selected topics from algorithmic graph theory, combinatorics, and order theory.

CS 430. Advanced Software Engineering. 3 Hours.
PR: CS 330 and CS 330L. Engineering process, project economics, project organizational and management issues, configuration management.

CS 440. Database Design and Theory. 3 Hours.
PR: CS 210 or (CS 330 and CS 330L). Database terminology, SQL, stored procedures, the relational and object-relational data model, triggers, and entity-relationship model.

CS 450. Operating Systems Structure. 4 Hours.
PR: WVU sections require CS 350, WVUIT sections require CS 355. Support of computer components; device management and interrupts, process scheduling, file management, complete OS structure, OS development and debugging, configuration management, and performance testing.

CS 455. Computer Architecture. 3 Hours.
PR: CPE 271. Computer structure; emphasis on implications for software design; evolution of computers; elementary digital logic; CPU structures; memory and I/O structures; pipelining and memory management; introduction to parallel and high-level architectures. (3 hr. lec.).

CS 460. Introduction to Big Data Engineering. 3 Hours.
PR: CS 320 or CS 350. Fundamental topics in big data analytics. Includes data structures, representations, and search techniques used in big data analytics. Basic methods in predictive analytics and machine learning, distributed file systems and high-performance computing used in addressing big data problems. Basic techniques for social network analysis and visualization in big data.

CS 470. Introduction to Computer Graphics. 3 Hours.
PR: WVU sections require CS 210, WVUIT sections require CS 201. Overview of 3D graphics hardware and gaming consoles; focus on developing 3D graphics software; fundamental algorithms for real-time 3D graphics with focus on game engine component development; introduction to three-dimensional game engine development.

CS 472. Artificial Intelligence. 3 Hours.
PR: WVU sections require CS 220 or MATH 375 or (MATH 303 and MATH 378), WVUIT sections require CS 222. Survey of AI techniques, heuristic search, game playing, and knowledge representation schemes: logic, semantic net, frames, rule-based; natural language processing, advanced AI techniques/systems: planning, blackboard architecture, neural net model; AI implementation.

CS 473. Introduction to Data Mining. 3 Hours.
PR: CS 110 and CS 110L with a minimum grade of C- and STAT 215. Fundamental topics in data mining. Introduction to data mining methods and theory.

CS 474. Introduction to Responsible and Safe AI. 3 Hours.
PR: (CS 330 and CS 330L) or CS 472. History, fundamental concepts, trustworthiness, and societal impact of artificial intelligence. Applications of AI including in healthcare, education, entertainment, transportation, law, and business will be explored.

CS 476S. Applied Artificial Intelligence Studio. 3 Hours.
PR: CS 472. Large-scale, collaborative projects involving the application of artificial intelligence to solve real-world problems.

CS 480S. Capstone Project - Design. 2 Hours.
PR: ENGL 102 or ENGL 103. Penultimate semester. Group senior design projects with individual design assignments appropriate to student's discipline. Complete system-level designs of the subsequent semester's project presented in written proposals and oral presentations. (Equivalent to BIOM 480, CPE 480, CS 480, and EE 480.).

CS 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

CS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

CS 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

CS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CS 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

CS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

CS 496. Senior Thesis. 1-3 Hours.
PR: Consent.

CS 497. Research. 1-6 Hours.
Independent research projects.

CSAD 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

CSAD 200. Introduction to Communication Disorders. 3 Hours.
Survey of speech, language, hearing, and swallowing disorders. Introduction to the discipline of communication sciences and disorders and the professions of speech- language pathology and audiology.

CSAD 222. Phonetics and Phonology. 3 Hours.
PR: CSAD 200 with a minimum grade of C- or consent. Description, classification, and transcription of the speech sounds in English. Phonetic and phonological principles will be emphasized in normal, dialectal, and clinical speech and language contexts, particularly as these principles apply to speech-language pathology and audiology.

CSAD 234. Anatomy and Physiology of Speech and Hearing. 4 Hours.
An overview of anatomy, physiology, and neural pathways for the speech and hearing mechanisms. The respiration, phonation, articulation, and resonance systems will be highlighted for speech production. The outer ear, middle, and inner ear will be highlighted for hearing perception.

CSAD 236. Language Science. 3 Hours.
Study of the structure and function of human language. Methodologies used within the field of speech-language pathology to examine oral and written language will be utilized.

CSAD 274. Manual Communication. 3 Hours.
PR: Consent. Development of skills needed to communicate in sign language. The manual alphabet, basic number concepts, and the basic vocabulary of traditional American signs.

CSAD 276. Intermed Manual Communication. 3 Hours.
PR: CSAD 274 or consent. Improve skills needed to communicate in sign language. Includes increasing sign language vocabulary, practicing finger spelling, and communicating with signs.

CSAD 280. Communication Disorder in Film. 3 Hours.
Analysis of selected films to explore the socio-emotional and functional impact of impaired speech, language, hearing, and cognition and the ways in which society views people with communication disorders.

CSAD 285. Introduction to Research in Communication Sciences and Disorders. 3 Hours.
PR: ECON 225 or STAT 211 with a minimum grade of C-. Overview of scientific principles underlying basic and applied research methods in communication sciences and disorders with a focus on developing foundations needed to read, interpret, and evaluate properties of published research reports.

CSAD 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CSAD 320. Speech Science. 3 Hours.
PR: CSAD 200 and CSAD 234 or consent. Review of the fundamental concepts related to acoustics, perception and production of speech, and associated theoretical models.

CSAD 326. Articulation and Cleft Palate. 3 Hours.
PR: CSAD 322. Characteristics and etiology of articulatory and phonological disorders; survey of diagnostic and therapeutic procedures. Characteristics of articulation and resonance, and survey of evaluation and treatment considerations for cleft palate.

CSAD 330. Foundations of Clinical Practice in CSD. 3 Hours.
PR: CSAD 285 with a minimum grade of C-. Understand and apply principles related to the diagnosis and treatment of individuals with communication disorders across the lifespan including aspects of counseling, administration and scoring of standardized tests, documentation of clinical services, and implementation treatment strategies.

CSAD 334. Neuroscience in Communication Sciences and Disorders. 3 Hours.
PR: CSAD 234 with a minimum grade of C- or consent. Expansion of the fundamental concepts related to anatomy and physiology of the central nervous system as they relate to speech, language, hearing, swallowing, vestibular, and cognitive function.

CSAD 336. Language Acquisition 1. 3 Hours.
PR: CSAD 222 and CSAD 236. Normal processes involved in the acquisition of language, including the development of phonological, semantic, morphological, pragmatic and syntactical systems in prelinguistic, emergent, and developing language stages. Application of these processes to the diagnosis and treatment of language disorders.

CSAD 340. Hearing Science. 3 Hours.
PR: CSAD 200 and CSAD 234. The purpose of this course is to provide the student with basic knowledge in two areas of hearing science: the physics of sound (acoustics) and the perception of sound (psychoacoustics). This knowledge will provide a foundation for further study in the field of communication sciences and disorders.

CSAD 342. Introduction To Audiology. 3 Hours.
PR: CSAD 234. Introduction to the profession of audiology; principles of hearing screening, audiological assessment and treatment; disorders of hearing; audiogram interpretation.

CSAD 388. International Experience/Communication Sciences and Disorders. 3 Hours.
Faculty-led exploration of professional practices and perspectives related to communication sciences and disorders in foreign countries and cultures. Offered only through study abroad. Additional fees required.

CSAD 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CSAD 422. Voice and Stuttering. 3 Hours.
PR: CSAD 200 and CSAD 326. Basic knowledge about and understanding of voice disorders and stuttering; relevant theories, facts, research findings, and clinical practice related to the epidemiology, etiology, course, prevention, diagnosis, and remediation.

CSAD 424. Language Disorders. 3 Hours.
PR: CSAD 336. The nature and etiology of child and adult language disorders are described. Assessment and remediation procedures are examined.

CSAD 426. Introduction to Speech Disorders. 3 Hours.
PR: CSAD 222 and CSAD 320. Introduction to the speech disorders of articulation, fluency, resonance and voice. Characteristics and course of treatment for the different disorder types will be discussed across the lifespan.

CSAD 436. Language Acquisition 2. 3 Hours.
PR: CSAD 336. Normal processes involved in the acquisition of oral and written language, including the later development of semantic, pragmatic, phonological, morphological, and syntactical systems. Application of these processes to the diagnosis and treatment of developmental language disorders.

CSAD 440. Audiological Assessment. 3 Hours.
PR: CSAD 340 and CSAD 342. Application of basic audiological techniques, including puretone and speech audiometry, masking, and immittance testing.

CSAD 442. Aural Rehabilitation. 3 Hours.
Communication and hearing impairment; aural rehabilitation evaluation; remediation including amplification, auditory and visual training, and ALD.

CSAD 480. Speech and Language Assisting. 3 Hours.
PR: Consent. Assisting graduate clinicians in the treatment of speech, language, and swallowing disorders.

CSAD 482. Speech and Language Practicum. 3 Hours.
PR: CSAD 480 with a minimum grade of B- and consent. Clinical Practicum in treatment of speech, language, and swallowing disorders.

CSAD 483. Audiology Practicum. 2 Hours.
PR: CSAD 440 with a minimum grade of B- or consent. Clinical practicum in audiology.

CSAD 485. Professional Applications in Communication Sciences and Disorders. 3 Hours.
PR: Required CSAD courses prior to the senior year. CSAD seniors will meet weekly face-to-face and online to develop a clinical research project related to speech, language, or hearing communication disorders.

CSAD 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CSAD 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

CSAD 496. Senior Thesis. 1-3 Hours.
PR: Consent.

CSAD 497. Research. 1-6 Hours.
Independent research projects.

CSEE 380. Engineering for Societal Impact. 2 Hours.
PR: Junior standing. An exploration of the pivotal role of engineering in shaping a better world. Presentations and activities designed to prepare students for capstone design projects and to make students ready for careers in industry, as entrepreneurs, as researchers, and in graduate school. Development of skills related to engineering design and implementation.

CSEE 480. Capstone Project - Design. 2 Hours.
PR: (ENGL 102 or ENGL 103) and CSEE 380 with a minimum grade of C- in each. Penultimate semester. Group senior design projects with individual design assignments appropriate to student's discipline. Complete system-level designs of the subsequent semester's project presented in written proposals and oral presentations. (Equivalent to BIOM 480, CPE 480, CS 480, CYBE 480, and EE 480.).

CSEE 480S. Capstone Project - Design. 2 Hours.
PR: (ENGL 102 or ENGL 103) and CSEE 380 with a minimum grade of C- in each. Penultimate semester. Group senior design projects with individual design assignments appropriate to student's discipline. Complete system-level designs of the subsequent semester's project presented in written proposals and oral presentations. (Equivalent to BIOM 480, CPE 480, CS 480, CSEE 480, CYBE 480, and EE 480.).

CSEE 481. Capstone Project - Implementation. 3 Hours.
PR: (CSEE 480 or CSEE 480S) with a minimum grade of C-. Continuation of CSEE 480. Detailed design and implementation of the system including choice of components, algorithm development, interfacing, troubleshooting, working in groups, and project management. Also covers professional topics, including ethics, liability, safety, socio-legal issues, risks and employment agreements.

CSEE 481S. Capstone Project - Implementation. 3 Hours.
PR: (CSEE 480 or CSEE 480S) with a minimum grade of C-. Continuation of CSEE 480 or CSEE 480S. Detailed design and implementation of the system including choice of components, algorithm development, interfacing, troubleshooting, working in groups, and project management. Also covers professional topics, including ethics, liability, safety, socio-legal issues, risks and employment agreements.

CSEE 489. STEM Teaching Practices. 3 Hours.
PR: (ENGL 101 and ENGL 102) or ENGL 103. Discussion of current issues, best practices, and professional ethics in STEM education. Hands-on workshops in curriculum design, lesson planning, instructional delivery, and assessment methods to prepare for student teaching roles. Student-centered approaches, evidence-based pedagogy, and active learning techniques.

CSEE 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice such as a tutor or assistant.

CSEE 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

CSEE 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

CSEE 497. Research. 1-6 Hours.
Independent research projects.

CYBE 266. Foundations of Cybersecurity. 3 Hours.
PR: WVU sections require CS 111 and CS 111L, WVUIT sections require CS 122 with a minimum grade of C-. An overview of the foundational areas of cybersecurity: data, software, system, human, and organizational security.

CYBE 366. Secure Software Development. 3 Hours.
PR: WVU sections require CS 330 and CS 330L and CS 350, WVUIT sections require CS 222 with a minimum grade of C- and CS 321. Covers the design, implementation, and testing of secure software. The topics include the role of security in the software development lifecycle, designing secure software, best security programming practices, and verification and validation of software applications’ security.

CYBE 435. Computer Incident Response. 3 Hours.
PR: CPE 310 or CS 455. Introduction to computer incident response, forensics, and computer security. Legal basis, proper procedures, and multiple operating systems application.

CYBE 460. Foundation of Cybersecurity 2. 3 Hours.
PR: (CS 453 or CPE 453) and CYBE 266. This course addresses areas of cybersecurity such as malicious code, spyware, and spam; social engineering and human aspects of cybersecurity; network security; cybersecurity of cloud and IoT; and cybersecurity policies. The objective of this course is to provide students with the knowledge and engineering approaches necessary to build and maintain secure cyber systems and networks.

CYBE 465. Cybersecurity Principles and Practice. 3 Hours.
PR: WVU sections require CS 350, PSC sections require CS 350 with a minimum grade of C-, and WVUIT sections require CS 321. Covers the principles and practice of cybersecurity. Addresses encryption; malicious code, spyware, and spam; authentication and access control; database security; operating system security; network security; and social engineering. Provides comprehensive overview of the cybersecurity threats, technologies for information assurance, and engineering approaches to build and maintain secure cyber space.

CYBE 466. Host Based Cyber Defense. 3 Hours.
PR: WVU sections require PR or CONC: CPE 453, WVUIT sections require CS 222 and CS 321 with a minimum grade of C- in each. An in depth study of the strategies available to defends hosts (clients, IoT devices, servers) against cyber attacks.

CYBE 467. Ethical Hacking & Penetration Testing. 3 Hours.
PR: WVU sections require CYBE 366 and (CPE 453 or CS 453), WVUIT sections require CS 222 and CS 321 with a minimum grade of C-. A study of offensive security from the mindset of a penetration test of a target network.

CYBE 468S. Cybersecurity Competitions. 3 Hours.
PR: CS 111 and CS 111L. Train, participate, and then recap competing in one or more designated cybersecurity competitions such as National Cyber League (NCL), Locked Shields (LS), and Mid Atlantic CCDC (MACCDC).

CYBE 480. Capstone Project - Design. 2 Hours.
PR: ENGL 102 or ENGL 103. Penultimate semester. Group senior design projects with individual design assignments appropriate to student's discipline. Complete system-level designs of the subsequent semester's project presented in written proposals and oral presentations. (Equivalent to BIOM 480, CPE 480, CS 480, and EE 480.).

CYBE 481. Capstone Project - Implementation. 3 Hours.
PR: CYBE 480. Continuation of CYBE 480. Detailed design and implementation of the system including choice of components, algorithm development, interfacing, troubleshooting, working in groups, and project management. Also covers professional topics, including ethics, liability, safety, socio-legal issues, risks and employment agreements.

CYBE 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offeings.

CYBR 415. Cybersecurity Operations. 3 Hours.
PR: (CPE 453 or MIST 355) and (CYBE 460 or MIST 356) with a minimum of C- in each. This Cybersecurity Operations course is aimed at studying of contemporary topics selected from recent developments in the field and exploring various cybersecurity tools and practices to build a connection between the cyber concepts and the applications of these concepts into the real world context.

CYBR 425. Cybersecurity Strategy, Risk, and Compliance. 3 Hours.
PR: (CPE 453 or MIST 355) with a minimum grade of C-. This course will prepare students to learn effective leadership solutions related to the management of security risks and cyber threats in private and public sector organizations including: risk analysis and risk management, information security controls, risk exposure, risk transfer, quantification of risk, insider threats, risk identification and reduction, the security auditing role, IT security governance, and security policy management.

CYBR 493. Special Topics. 1-6 Hours.
A study of contemporary topics selected from recent developments in the field.

DANC 100S. Fundamentals of Dance Techniques. 2 Hours.
Studio class covering fundamental of dance techniques such as Ballet, Modern Dance, Jazz Dance, Tap, Ballroom, Partner dances and other dance and movement vocabulary such as folk and social dances.

DANC 110S. Fundamentals of Ballet. 2 Hours.
Topics include basic ballet dance technique, dance vocabulary, dance literacy, proper alignment, musicality, add sound anatomical practices. (May be repeated for a maximum of 4 credit hours.).

DANC 120S. Fundamentals of Modern Dance Technique. 2 Hours.
PR: Permission of instructor. This course is the study of dance at the fundamental level focusing on Modern Dance technique and performance.

DANC 130S. Fundamentals of Jazz. 2 Hours.
Basic jazz dance fundamentals and techniques; development of coordination, strength, and flexibility through the execution of the elementary jazz warm-ups, movement progressions, and combinations. (May be repeated for a maximum of 4 credit hours.).

DANC 140S. Fundamentals of Tap. 2 Hours.
A studio course designed to introduce the student to the genre of tap dancing. The course will introduce and teach the student beginner level models, movement phrases and techniques through styles of the genre. (May be repeated for a maximum of 4 credit hours.).

DANC 170. Introduction to Dance. 3 Hours.
Introductory lecture course, designed to develop an aesthetic appreciation and understanding of dance as a fine art and its impact on society. This course has a practical component so that students have the opportunity to experience various forms of dance.

DANC 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

DANC 200. Dance Practicum. 1 Hour.
PR: By audition only. (May be repeated for a maximum of 6 credit hours.) Students participate as dancers/performers in a dance production. Contact the Director of Dance for audition information.

DANC 210S. Intermediate Ballet. 2 Hours.
PR: DANC 110 or DANC 110S or consent. Techniques of classical ballet dancing. Includes barre exercises, adage combinations, and center practice. A theoretical knowledge and technical achievement is stressed. (May be repeated for a maximum of 8 credit hours.).

DANC 220S. Intermediate Modern. 2 Hours.
PR: DANC 120 or DANC 120S or consent. Topics covered include intermediate modern dance technique, dance vocabulary, dance literacy, proper alignment, musicality, and sound anatomical practices. The course focuses on core styles within the modern dance genre. (May be repeated for a maximum of 6 credit hours.).

DANC 230S. Intermediate Jazz. 2 Hours.
PR: Consent. Continuation of jazz dance techniques and concepts with an emphasis on jazz isolations, polyrhythms, and syncopated movement sequences, continued practice in development of the body as an instrument of expression. (May be repeated for a maximum of 6 credit hours.).

DANC 240S. Intermediate Tap. 2 Hours.
PR: DANC 140 or DANC 140S or consent. A studio course focusing on dance through tap dance technique at the intermediate level. Teaching the student intermediate models, movement phrases and techniques through styles of the Tap Dance genre of movement. (May be repeated for a maximum of 4 credit hours.).

DANC 250S. Ballroom Dance. 1 Hour.
Introduction to popular ballroom dancing. Styles will range from fox trot, waltz and swing to Latin dances.

DANC 251S. World Dance. 3 Hours.
Introduction to world cultures through the media of dance lecture and movement. Study of global, religious, social, educational and courtship rituals as related to dance.

DANC 252S. African Dance. 2 Hours.
Exploring the cultures and techniques of African dance styles.

DANC 253S. Yoga for Dancers. 2 Hours.
PR: Dance majors and Dance minors only. The course provides the dance student with the tools to condition and maintain a healthy body and improved dance technique using the modality of yoga. Through the use of anatomical vocabulary, basic theoretical concepts and experiential physical practice, as well as though readings and assessments, the student will gain a greater understanding of Hatha Yoga as it augments dance technique.

DANC 255S. Dance Styles for Musical Theatre. 1 Hour.
PR: DANC 130 or DANC 130S or DANC 140 or DANC 140S. An introduction to musical theatre repertoire along with gaining a more efficient and proficient way of learning and executing Broadway musical choreography, new and old. This course gives the student the tools needed at an intermediate to advanced level of dance, to complement their singing and acting abilities; learning choreography from notable musicals.

DANC 260S. Fundamentals of Choreography. 3 Hours.
PR: DANC 100 or DANC 100S or DANC 110 or DANC 110S or DANC 130 or DANC 130S. Introductory study of basic elements of choreography including spatial design, choreographic devices, movement analysis, the creation of movement phrases, and creative problem solving.

DANC 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

DANC 300. Dance Practicum. 1-3 Hours.
PR: By audition only. (May be repeated for a maximum of 6 credit hours.) Students participate as dancers/performers in a dance production. Contact the Director of Dance for audition information.

DANC 310S. Intermediate/Advanced Ballet. 2 Hours.
PR: DANC 210 or DANC 210S or consent. Topics covered include advanced classical and contemporary ballet dance techniques, dance vocabulary, dance literacy, proper alignment, musicality, and sound anatomical practices. (May be repeated for a maximum of 8 credit hours.).

DANC 320S. Advanced Modern. 2 Hours.
PR: DANC 220 or DANC 220S or consent. Topics covered include advanced modern dance technique, dance vocabulary, dance literacy, proper alignment, musicality, and sound anatomical practices. (May be repeated for a maximum of 6 credit hours.).

DANC 330S. Advanced Jazz. 2 Hours.
PR: DANC 230 or DANC 230S. In-depth exploration of both traditional and contemporary jazz techniques and styles, continues progression towards a more advanced level of technical skill as developed and utilized through this specific dance technique.

DANC 340S. Advanced Tap. 2 Hours.
PR: DANC 240S with a minimum grade of C-. This course is dedicated to the study of tap dance at the advanced level. The course will introduce tap dance steps and concepts. The class concentrates and refines the principles introduced in DANC 240S.

DANC 350S. Modern and Ballet Partnering. 2 Hours.
PR: (DANC 210 or DANC 210S) and (DANC 220 or DANC 220S) or consent. The practical application of partnering work as it pertains to movement and dance through weight sharing and trust training models and movement phrases in modern and ballet genres of dance. (May be repeated for a maximum of 4 credit hours.).

DANC 360S. Advanced Choreography. 3 Hours.
PR: DANC 260 or DANC 260S. Provides opportunity at the advanced level for creative exploration and analysis of principles of dance composition through improvisations and problem solving. Informal presentation of student works will be included.

DANC 370. Dance History. 3 Hours.
PR: DANC 100 or DANC 170. A study of dance history and leading prominent personalities in the field of dance through their legacy of techniques, choreography and performance. The course will also address the contribution of dance to, and the place of dance within, society and the cultural environment.

DANC 371. Creative Dance for Educators. 3 Hours.
PR: DANC 100 or DANS 170. Specific learning experiences for the future of dance education and competencies to be achieved for children's dance. Grades PreK-12. Integration of movement experience with other academic subjects and various cultural heritages emphasized.

DANC 372. Dance Criticism. 3 Hours.
PR: (ENGL 101 and ENGL 102) or ENGL 103. This course is designed for Dance major/minor students and other students interested in reading and writing about dance and dance performance, and viewing performances.

DANC 400. Choreography Practicum. 2 Hours.
PR: DANC 260 and consent. (May be repeated for a maximum of 6 credit hours.) Students participate as choreographers in a dance production. Contact the director of Dance for audition information.

DANC 401. Dance Capstone. 3 Hours.
PR: Dance majors only. The Dance Capstone course is intended as the culminating course for the Dance major student. Dance majors who are looking to graduate are required to register for this course in their final semester.

DANC 410S. Advanced Ballet. 2 Hours.
PR: DANC 310S or permission of instructor. This course focuses on the study of Ballet at the advanced level. The course falls in the sequence of ballet technique curriculum offered through the Dance program. The focus of the course content is to continue to develop and train the student's craft and movement skills based on the classical form of dance through the ballet movement vocabulary.

DANC 420S. Modern Repertory. 1 Hour.
PR: By audition only. The study and practice of excerpts from dances by prominent contemporary choreographers. The course covers historical aspects of each of the segments studied and its place within the larger context of dance history. (May be repeated for a maximum of 4 credit hours.).

DANC 450S. Contemporary Rep. 2 Hours.
PR: DANC 100 or DANC 100S or DANC 120 or DANC 120S. This course is the study of contemporary dance repertoire. The course is intended for the advance intermediate through advanced level dance student. The course will further develop contemporary dance vocabulary, movement skills and provide challenges in musical and movement phrasing.

DANC 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

DANC 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

DANC 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

DANC 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

DANC 496. Senior Thesis. 1-3 Hours.
PR: Consent.

DANC 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

DISB 101. Country Roads: Introduction to Social/Communication. 4 Hours.
Studies the written, nonverbal recognition, and verbal communication skills found within the academic, occupational, and social settings for young adults; identifies and develops strategies and skills for analyzing social situations and conventions; emphasizes reading comprehension and communication skills necessary for building strong relationships and clear communication with professionals, friends, and colleagues. Required Country Roads Program enrollment.

DISB 102. Country Roads: Occupational Preparation. 5 Hours.
Strengthen resources and capacity to reach occupational interests and goals; review and practice soft skills such as active listening, body language, problem solving, conflict resolution, setting goals, and occupational balance; engage in activities that will help build rapport among a group in the academic and/or work setting; work on short-term certificates for resume and skills sets; participate in on-site training.

DISB 103. Country Roads: Leadership Domain. 3 Hours.
Identify, discuss, and practice self-determination skills - motivation to make, or at least be centrally involved in making one's own choices and set own goals; increase self-awareness, advocacy, and leadership skills; engage in leadership opportunities; identify, plan, implement, and evaluate individual plans incorporating personal and occupational goals; initiate and sustain discussions about own needs, capacity and steps to meet goals.

DISB 104. Country Roads: Independent Living Domain. 3 Hours.
Establish and sustain independent living schedules on- and off-campus; identify and practice interactional skills among roommates across dorm and apartment settings; complete coursework for introductory daily living skills; complete daily living and independent skill assessments; Identify and incorporate assistive technology as needed; engage in work-academic transportation and other living obligations.

DISB 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

DISB 304. Special Education in Contemporary Society. 3 Hours.
Special education principles and practices, interactions between disability and diversity in identification and intervention, and influences of family, professional, school, and community infrastructures on educational programs/outcomes for children and adults.

DISB 380. Disability and the Family. 3 Hours.
This course is designed to familiarize the students with developmental disabilities and their impact on families. Interdisciplinary family-centered care is emphasized, along with how to access resources to meet the needs of children and families.

DISB 381. Lifespan Disability Policy. 3 Hours.
Overview of health, education, financial and related policies impacting individuals with disabilities across the lifespan and at the federal, state, and local levels.

DISB 385. Disability and Society. 3 Hours.
This course provides a global, interdisciplinary overview of issues and policies that are the concern of individuals with disabilities (e.g., public policy, health-related issues, employment, and social benefits).

DISB 482. Disability in the Community. 2 Hours.
This course offers service learning experiences in the community with persons who have a disability.

DISB 486. Capstone Portfolio: Disability. 1 Hour.
This undergraduate capstone for the interdisciplinary certificate program or minor in Disability Studies culminates with a written essay, a presentation, and a portfolio.

DMC 460. Introduction to Data Marketing Communications. 3 Hours.
PR: Admission to the program or permission. This course is the introductory course experience for the data marketing communications master's degree program. Students will explore the fundamentals of using data to make marketing communications decisions, as well as topics including database marketing, loyalty programs, financial and marketing metrics, audience targeting and segmentation, data for digital marketing, data visualization and marketing automation.

DSCI 101. Introduction to Data Science. 3 Hours.
Introduction and overview of this interdisciplinary field and the basic computer programming skills needed to work as a data scientist. Provides students basic experience in acquiring data, performing very simple analyses, and gaining an elementary understanding of data science.

DSCI 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

DSCI 209. Data Science Pipelines with Python and R. 3 Hours.
PR: DSCI 101 with a minimum grade of C- and MATH 124 or higher (up to MATH 156) with a minimum grade of C-. Development of workflow or computer programs to import, clean, transform, model and visualize data. Using data from different disciplines, students will program in Python and R as they develop these data science pipelines and present their results.

DSCI 221. Reproducible Data Science using R. 3 Hours.
PR: CS 110 and DSCI 101 with a minimum grade of C- in each. Introduction to programming in R and to using RStudio, and using the tidyverse set of packages to learn the basics of a data science pipeline needed to import, clean, transform, visualize and model large amounts of data.

DSCI 222. Data Science Workflows using Python. 3 Hours.
PR: CS 110 and DSCI 101 with a minimum grade of C- in each. Introduction to programming in Python, to the basics of building a data science pipeline. Students develop projects using data from various sources to develop and refine their Python skills. Also teaches the basics of terminal mode and use of bash.

DSCI 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

DSCI 301. Databases for Data Science. 3 Hours.
PR or CONC: (DSCI 209 or DSCI 221) with a minimum grade of C-. Focuses on understanding relational or categorical data structures associated with databases in a data science pipeline and acquiring data from existing databases using R and Python.

DSCI 309. Applied Machine Learning. 3 Hours.
PR: MATH 124 or MATH 126 with a minimum grade of C-. Statistical machine learning methods for supervised and unsupervised learning will be introduced via applications. Specifically, linear regression, methods for classification, resampling, model choice, dimension reduction and clustering will be covered with a conceptual understanding and their implementation using R and Python.

DSCI 310. Statistical Machine Learning 1. 3 Hours.
PR: STAT 312 and (PR or CONC: DSCI 222 and MATH 441) with a minimum grade of C-. Focuses on a conceptual understanding of statistical machine learning methods and their implementation using python. Covers linear regression; classification methods (logistic regression, linear discriminant analysis, Naive Bayes and K-nearest neighbors); Generalized Linear Models; resampling methods (cross-validation and bootstrap); model choice methods (subset and stepwise selection, shrinkage methods, dimensionality reduction).

DSCI 311. Statistical Machine Learning 2. 3 Hours.
PR: DSCI 310 with a minimum grade of C-. Continuation of DSCI 310. Covers statistical machine learning methods that are not strictly linear, such as models based on splines, tree-structures, support vector machines and unsupervised methods. Emphasizes a conceptual understanding and application of the methods using R and Python.

DSCI 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

DSCI 409. Advanced Case Studies in Data Science. 3 Hours.
PR: DSCI 309 with a minimum grade of C-. The course covers advanced methods through case studies. Four main topics will be computing and analyzing data using the high performance computing, and case studies with natural language processing, real-time streaming data and imaging data. Concurrently students will acquire data from their own major and put together a data science pipeline and analysis for their final project.

DSCI 410. Big Data in Practice: Cloud and Parallel Computing. 3 Hours.
PR: DSCI 311 with a minimum grade of C-. Extends the R “tidyverse” data manipulation and machine learning pipelines to relational database tables; big data; network data; streaming data. Students will develop their abilities from using RStudio locally on a laptop to using it on a server, with technologies such as Spark.

DSCI 450. Current Topics in Data Science. 3 Hours.
PR: DSCI 311 with a minimum grade of C-. Exploration of timely current topics where data science is used; exploration and discussion of biases and other aspects of decisions made as a result of data science tools.

DSCI 480. Capstone Design. 1 Hour.
PR: DSCI 310 with a minimum grade of C-. Application of skills and methods acquired through core coursework through the design of research project; students will practice effective written communication and engage in purposeful writing and presenting in data science.

DSCI 481. Capstone Experience. 2 Hours.
PR: DSCI 480 with a minimum grade of C-. Application of skills and methods acquired through core coursework to dcomplete a capstone research project based on real world data. Students will practice effective written and oral communication and engage in purposeful writing and presenting in data science.

DSCI 495. Independent Study. 1-6 Hours.
PR: Consent. Faculty-supervised study of topics not available through regular course offerings.

DSCI 497. Research. 1-6 Hours.
PR: Consent. Independent research projects.

DSGN 130S. Introduction to Design Studies Studio. 3 Hours.
This course is an opportunity for you to learn and apply the elements and principles of design. These concepts will be applied to creating successful two- and three-dimensional design projects. You will also learn about the design industry and identify how all design professions have common foundations.

DSGN 140. Sustainable Living. 3 Hours.
Explores the personal, social, economic and environmental aspects of making sustainable choices. Sustainability principles and practices are discussed along with assessments of consumption and lifestyle decisions. Also listed as PLSC 140 and RESM 140.

DSGN 160. Visual Communications. 3 Hours.
Using the design process, this course explores the issues of clarity in graphic communications through 2-dimensional and 3-dimensional representations using computer graphic software. Course also addresses the physical and psychological aspects of human emotions, and non-western social norms and their influence on design process and outcome.

DSGN 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

DSGN 200. Information Communications. 3 Hours.
This course provides advanced instruction in computer graphic software as used to explore the issues of clarity in graphics, motion, and spoken communications. Students address physical and psychological aspects of human factors and their influence on design process, and present evidence in a professional manner.

DSGN 220. Design Thinking. 3 Hours.
This course establishes the value of design thinking, identifies the components of the design thinking process, and helps students develop proficiency by using the process in multiple contexts.

DSGN 270. Product Design Foundations. 3 Hours.
This course concentrates on materials/manufacturing technology, visualization techniques and observational techniques of people as well as to design better consumer products. Sketching and digital prototyping techniques will be introduced and practiced to display and analyze possible effectiveness of the design solution. In-class lecture, discussion and design work is augmented by out-of-class work towards presentations to the group.

DSGN 280. Sustainable Design and Development. 3 Hours.
An overview of social, environmental and economic aspects of the built environment. Site considerations, infrastructure, green buildings, marketing, financing, community. (Local field trips possible.).

DSGN 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

DSGN 300. Product Design. 3 Hours.
This course follows observational techniques of people as well as materials/manufacturing technology to design better consumer products. Sketching, model making, and prototyping techniques will be introduced and practiced to display and analyze possible effectiveness of the design solution. In-class lecture, discussion and studio work is augmented by out-of-class work towards presentations to the group.

DSGN 310. Product Design-Footwear. 3 Hours.
This course will explore the R&D processes associated with footwear design from concept to market. Discussions, lectures and projects will provide a complete understanding of how designers work within the constraints of economics, manufacturing and consumer culture in a collective effort to get a shoe on the shelf in stores.

DSGN 315. Survey of Non-Western Design. 3 Hours.
This course examines design from beyond the tradition of Western civilization. Students will study interior design, architecture, and art as shaped by religious beliefs, political systems, and geographical context.

DSGN 320. Design Ethics and Social Responsibility. 3 Hours.
PR: DSGN 220 with a minimum grade of C-. This course will introduce students to the study of both philosophical and applied ethics as they relate to daily life and design. Additionally, the course will address and define components of personal and corporate social responsibility, and explore their relationship to ethics and design at the micro and macro levels.

DSGN 340. Design for Energy Efficiency. 3 Hours.
An overview of energy efficiency in residential and small commercial settings. Energy, building shell, air leakage, insulation, hvac, lighting, appliances, water heating, indoor air quality. (Local field trips possible.).

DSGN 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

DSGN 420. Professional Preparation. 1 Hour.
PR: DSGN 220 and DSGN 320 with a minimum grade of C- in each. This course challenges students to utilize the design process to identify personal skills and characteristics relevant to their job goals, and create a coherent branded professional identity based on the expectations of their industry. Students will also analyze and synthesize business trends and forecasting predictions, applying that information to future expectations in their field of study.

DSGN 470. Leadership in Energy and Environmental Design Green Building Systems. 3 Hours.
PR: DSGN 280. A detailed study of the LEED green building certification systems, including the various green systems, codes and standards referenced by LEED.

DSGN 480. Designing Innovative Futures. 3 Hours.
PR: DSGN 320 and DSGN 491 with a minimum grade of C- in both. This capstone course provides an opportunity to analyze and synthesize information from previous coursework and internship experiences to develop professional proficiency levels in integrated design approaches.

DSGN 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

DSGN 491. Professional Field Experience: Capstone. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

DSGN 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

DSGN 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

DSGN 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.

DSM 101. Introduction to Design and Merchandising. 1 Hour.
Provides an introduction to the educational culture in the Division of Design and Merchandising.

DSM 130. Introduction to Design. 3 Hours.
Introduction to design as a process of improving quality of life and a method of problem-solving using design thinking, design theory, and design applications in interdisciplinary contexts.

DSM 199. Orientation to Design and Merchandising. 1,2 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities and opportunities.

DSM 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

DSM 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

DSM 410. The Global Context for Design. 3 Hours.
Develops students' abilities to weigh design decisions and engage in design practice in a globalized economy within the parameters of ecological, socio-economic, and western and non-western cultural contexts.

DSM 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

DSM 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

DSM 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

DSM 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

DSM 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

DSM 496. Senior Thesis. 1-3 Hours.
PR: Consent.

DSM 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

DTHY 100. Health Care Terminology. 1 Hour.
This course provides the foundation for understanding common terminology used in health care. The components, pronunciation, proper use, and abbreviations of medical terminology will be discussed. Emphasis will be placed on dental terminology.

DTHY 101. Introduction to Dental Hygiene. 2 Hours.
PR: Consent. Historical evolution of the profession, the professional association, specialties of dentistry and the various roles of a dental hygienist will be emphasized. This course incorporates the University's required first-year experience objectives.

DTHY 185. Oral Anatomy. 2 Hours.
PR: Acceptance into dental hygiene. The human neck bones, muscles, nerves, blood supply, lymphatics, glandular tissue, fascia/spaces, TMJ, and spread of dental infection are the focus of this course.

DTHY 186. Dental Anatomy. 2 Hours.
PR: DTHY 100 and DTHY 185 and NBAN 301. Classroom and laboratory study of normal human dental morphology, tooth anomalies, pulp function, eruption patterns and occlusal relationships.

DTHY 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

DTHY 205. Theory and Practice of Prevention. 2 Hours.
PR: Enrollment in dental hygiene. Philosophy and techniques of preventive dentistry.

DTHY 210. Dental Radiology. 2 Hours.
PR: Enrollment in dental hygiene. Basic principles and procedure in oral radiology techniques and interpretation.

DTHY 211. Dental Radiology. 1 Hour.
PR: DTHY 210. The application of radiology principles and techniques. Clinical integration and case presentations will be emphasized.

DTHY 220. Dental Nursing Techniques. 2 Hours.
PR: Enrollment in dental hygiene. Emergency first aid and principles of nursing applicable to the dental office.

DTHY 225. Dental Hygiene Techniques. 4 Hours.
PR: Enrollment in dental hygiene. Fundamental principles and techniques of dental hygiene are presented through lectures, laboratory, and clinical participation.

DTHY 226. Clinical Dental Hygiene. 1 Hour.
PR: DTHY 225. This course enables the sophomore dental hygiene student to gain proficiency in the treatment of patients.

DTHY 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

DTHY 300. Anesthesia for Dental Hygiene. 1 Hour.
Application of neuroanatomy, physiology, and pharmacology to the administration of regional anesthesia using local anesthetic agents. Management of complications encountered and the techniques of administering these agents will be presented.

DTHY 301. Public Health. 1 Hour.
PR: Enrollment in dental hygiene. Theory and practice of preventive dentistry and community.

DTHY 320. Dental Radiology. 2 Hours.
PR: Enrollment in dental hygiene. Basic principles and procedures in oral radiology techniques and interpretation.

DTHY 322. Dental Radiology. 1 Hour.
PR: DTHY 320. The application of radiology principles and techniques. Clinical integration and case presentations will be emphasized.

DTHY 350. Public Health. 2 Hours.
PR: Enrollment in dental hygiene. Theory and practice of preventive dentistry and community. Methods and techniques utilized in dental hygiene research.

DTHY 351. Dental Health Education. 3 Hours.
PR: Enrollment in dental hygiene. Methods, materials, and resources used in teaching dental health to various population groups.

DTHY 360. Dental Materials. 3 Hours.
PR: Enrollment in dental hygiene. Lecture and laboratory covering the science and manipulation of dental materials.

DTHY 361. Expanded Functions. 2 Hours.
PR: DTHY 360. Lecture and laboratory covering specialty topics in dentistry and four-handed dental assisting. Assisting, and the placing and carving of amalgam and resin restorations in dentiform teeth. (1 hr. lec., 4 hr. lab.).

DTHY 363. Periodontics 1. 1 Hour.
PR: Enrollment in dental hygiene. Tissues of the periodontium, histopathology of periodontal disease with emphasis on etiology, assessment, diagnosis, treatment, and prevention within the scope of dental hygiene.

DTHY 364. Periodontics 2. 2 Hours.
PR: DTHY 363. A sequential course to DTHY 363.

DTHY 366. Technical Expression and Dental Literature. 1 Hour.
PR: Dental hygiene major. Preparation and analysis of professional communications.

DTHY 370. Dental Hygiene Clinical Methods. 2 Hours.
PR: DTHY 225. Principles of oral debridement, instruction in the care of special patients, use of diagnostic aids, and nutritional counseling.

DTHY 372. Clinical Dental Hygiene 1. 2 Hours.
PR: DTHY 225. Clinical application of dental hygiene principles and techniques.

DTHY 374. Clinical Dental Hygiene 2. 3 Hours.
PR: DTHY 370, CoReq: DTHY 372. Clinical application of dental hygiene principles and techniques.

DTHY 378. Dental Hygiene Teaching Methods. 2 Hours.
PR: Enrollment in dental hygiene. Concepts and principles of administration, curriculum, and clinical teaching unique to dental auxiliary education. Emphasis on overall role of the dental hygiene educator.

DTHY 380. Interdisciplinary Approach to Rural Health. 1 Hour.
Fundamental principles of and background information on Appalachian history, poverty, and cultural diversity for the assessment of rural health needs. Assess the delivery of health care services and community development in rural settings.

DTHY 402. Dental Hygiene Ethics and Practice. 1 Hour.
PR: Enrollment in Dental Hygiene. Scope of practice for the dental hygienist including ethical and legal considerations. Public and professional relations as well as practice management are discussed.

DTHY 405. Advanced Clinical Dental Hygiene 1. 4 Hours.
PR: Fourth year in dental hygiene. Principles of advanced clinical dental hygiene and practice in non-traditional settings. Clinical experience in traditional and expanded duties; pre- and post-operative care of surgical patients, and radiology.

DTHY 406. Advanced Clinical Dental Hygiene 2. 3,4 Hours.
PR: Fourth year in dental hygiene. Continuation of clinical practice experience in dental hygiene procedures.

DTHY 407. Advanced Dental Hygiene Methods 2. 2 Hours.
PR: Fourth year in dental hygiene. Principles of advanced clinical dental hygiene and practice in non-traditional settings.

DTHY 409. Clinical Dental Hygiene. 1 Hour.
PR: DTHY 374. This course enables senior dental hygiene student to gain proficiency in the treatment of patients.

DTHY 410. Clinical Dental Hygiene 3. 1-4 Hours.
This course enables the senior dental hygiene degree completion student to maintain proficiency in the treatment of patients.

DTHY 411. Clinical Dental Hygiene 4. 1-4 Hours.
This course enables the senior dental hygiene degree completion student to maintain proficiency in the treatment of patients.

DTHY 440. Senior Integration Seminar. 1 Hour.
PR: Consent. A thorough analysis and integration of didactic, laboratory and clinical content via lectures, discussions and cases in preparation for licensure.

DTHY 445. Applied Pharmacology. 1 Hour.
PR: PCOL 260. Case studies encountered in dental hygiene practice that require critical thinking and decision-making to manage the dental treatment needs and potential complications of patients taking multiple pharmacologic agents.

DTHY 450. Dental Health Education 2. 2 Hours.
PR: DTHY 302. Advanced dental health education with a research component. A problem-based learning experience.

DTHY 451. Dental Health Education 3. 2 Hours.
PR: DTHY 450. Advanced dental health education with field experiences in three settings. Case histories developed and research study completed.

DTHY 478. Clinical Evaluation. 1 Hour.
PR: DTHY 378. Preparation for clinical instruction and evaluation. Emphasis is placed on clinical evaluation procedures, proper instrumentation and the skills/strategies utilized to promote affective and psychomotor skill development in students.

DTHY 482. Intra-Oral Photography. 1 Hour.
PR: DTHY 405. Intra-oral photography is a one-semester course which deals with the principles and techniques of photography and its application to dentistry.

DTHY 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

DTHY 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

DTHY 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

DTHY 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

DTHY 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

DTHY 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

DTHY 496. Senior Thesis. 1-3 Hours.
PR: Consent.

DTHY 497. Research. 1-6 Hours.
Independent research projects.

DTHY 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ECON 200. Survey of Economics. 3 Hours.
Introduction to the analysis of the economic system, pricing system, monetary system, determination of all national income and employment. ECON 200 is equivalent to BUSA 201. Credit cannot be received for both.

ECON 201. Principles of Microeconomics. 3 Hours.
Introductory microeconomics analysis. Competitive behavior of firms, price determination, efficiency in production and equity in distribution. Pre-requisite(s) and/or co-requisite(s) may differ on regional campuses.

ECON 202. Principles of Macroeconomics. 3 Hours.
PR: WVU sections require ECON 201 or ARE 150 with a minimum grade of C-, WVUIT sections require ECON 201 with a minimum grade of C-. Introductory macroeconomics analysis, prerequisites are not enforced at WVUIT and Potomac State campuses. Aggregate demand and supply, saving, investment, the level of employment and national income determination, monetary and fiscal policy.

ECON 225. Elementary Business and Economics Statistics. 3 Hours.
PR: MATH 122 or MATH 123 or MATH 124 or MATH 126 or MATH 129 or MATH 153 with a minimum grade of C- or MATH 150 or MATH 154 or MATH 155 or MATH 156 with a minimum grade of D-. Basic concepts of statistical models, distributions, probability, random variables, tests of hypotheses, confidence intervals, regression and correlation with emphasis on business and economics examples. (Not open to students who have completed STAT 215.).

ECON 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ECON 297. Research. 1-6 Hours.
Independent research projects.

ECON 301. Intermediate Micro-Economic Theory. 3 Hours.
PR: ARE 150 or ECON 201 with a minimum grade of C-. Consumer choice and demand; price and output determination of the firm, and resource allocation, under different market structures; welfare economics, externalities, public goods, and market failure; general equilibrium; other topics.

ECON 302. Intermediate Macro-Economic Theory. 3 Hours.
PR: (ECON 201 or ARE 150) and ECON 202 with a minimum grade of C- in all. Forces which determine the level of income, employment, output, the inflation rate, and the balance of trade. Particular attention to consumer behavior, investment determination, and government fiscal and monetary policy.

ECON 306. History of Economic Thought. 3 Hours.
PR: ECON 202 with minimum grade of C-. Economic ideas in perspective of historic development.

ECON 331. Money and Banking. 3 Hours.
PR: ECON 202 with a minimum grade of C-. The U.S. monetary and banking system and its functional relationship to the economic system; monetary theory and policy.

ECON 411. Moral Foundations of Capitalism. 3 Hours.
PR: ECON 202 with a minimum grade of C-. Introduction to the moral foundations of capitalism. Compare and contrast alternative ethical systems using economic analysis when relevant.

ECON 421. Introduction to Mathematical Economics. 3 Hours.
PR: ECON 202 with a minimum grade of C- and (MATH 150 with a minimum grade of C- or MATH 155 or MATH 156 with a minimum grade of D-). Principal mathematical techniques including set operation, matrix algebra, differential and integral calculus employed in economic analysis. Particular attention given to static (or equilibrium) analysis, comparative-static analysis and optimization problems in economics.

ECON 425. Introductory Econometrics. 3 Hours.
PR: ECON 202 and (ECON 225 or STAT 211 or STAT 215) with a minimum grade of C- in all. Analysis of economic models using basic econometric methods. Specification, computation, and interpretation of linear regression.

ECON 441. Public Economics. 3 Hours.
PR: ECON 202 with a minimum grade of C-. Economic roles of the public sector. Particular attention to market failure, redistributing income, the financing of public sector activities, relationships between federal, state, and local governments, and public choice.

ECON 443. Law and Economics. 3 Hours.
PR: ECON 201 with a minimum grade of C-. We will use the tools and reasoning of economics to study the legal system. Legal institutions have been developed to govern our lives. A formal analysis of the outcomes these institutions create is essential to construct policy and institutional changes to promote a prosperous society. We conduct this institutional analysis applying the tools of economics.

ECON 445. Government and Business. 3 Hours.
PR: WVU sections require ECON 202 with a minimum grade of C-, WVUIT sections require ECON 201 or ECON 202. Examination of market structure, conduct, and performance. Analysis of market regulation including antitrust laws and regulation of monopolies.

ECON 451. International Economics. 3 Hours.
PR: ECON 202 with a minimum grade of C-. Development of trade among nations; theories of trade; policies, physical factors, trends, barriers to trade. Determination of exchange rates. Open economy macroeconomics.

ECON 454. Comparative Economic Systems. 3 Hours.
PR: ECON 202 with a minimum grade of C-. Structure and processes of existing economic systems including capitalism, planned socialism, and market socialism. Problems encountered by economies in transition from planned socialism to capitalism.

ECON 455. Economic Development. 3 Hours.
PR: ECON 202 with a minimum grade of C-. The problems, changes, and principal policy issues faced by non-industrialized countries.

ECON 461. Regional Economics. 3 Hours.
PR: ECON 202 with a minimum grade of C-. Analysis of the regional economy's spatial dimension, emphasizing interregional capital and labor mobility, the role of cities, objectives and issues of regional policy, lagging regions and Appalachia, growth poles, and regional growth and income distribution.

ECON 462. Urban Economics. 3 Hours.
The goal of urban economics is to help explain why cities exist. Observation shows us that people and firms choose to concentrate in urban areas (cities) despite historically higher land costs, crime rates, and pollution. The urban economist is concerned with why people and firms concentrate despite these costs.

ECON 463. Applied Regional Economics Research. 3 Hours.
PR: ECON 202 and ECON 225 with a minimum grade of B- in each. This course offers a unique experiential learning opportunity in economics in which students will ultimately conduct, package, and publicly present the type of research that is regularly underway in the BBER. In particular, after learning the basics of econometrics and economic forecasting, students will compile and present an economic outlook report for a particular region in West Virginia.

ECON 465. Health Economics. 3 Hours.
PR: WVU sections require ECON 201 and (ECON 225 or STAT 211) with minimum grade of C-, WVUIT sections require ECON 201 and (ECON 225 or STAT 211). Health economics applies the tools of economics and econometrics to issues of the organization, delivery and financing of health care.

ECON 471. Labor Economics. 3 Hours.
PR: ECON 202 with a minimum grade of C-. Labor market analysis. Topics include wage and employment determination, human capital theory, discrimination, unemployment, migration, effects of unions and government regulation, and life-cycle patterns of work.

ECON 472. Economics of Education. 3 Hours.
PR: ECON 201 with a minimum grade of C-. Economic analysis of education policy, including education production function, markets for schools and teachers, and education. Explores the resultant externalities and internalities on society and within respective educational systems.

ECON 481. American Economic History. 3 Hours.
PR: ECON 202 with a minimum grade of C-. Central issues in the development of the American economy.

ECON 482. Applied Economic Research. 3 Hours.
PR: Senior standing and ECON 425 with a minimum grade of C-. Capstone course that introduces students to applied economic research. Completion and presentation of major research project required.

ECON 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ECON 491. Professional Field Experience. 1-18 Hours.
PR:Consent. (May be repeated up to a maximum of 6 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ECON 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ECON 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ECON 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ECON 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ECON 497. Research. 1-6 Hours.
Independent research projects.

ECON 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ECSE 311. Developmental Assessment for Young Children with Special Needs. 3 Hours.
PR: SPED 304. Biological and environmental factors associated with developmental disabilities, delays and at risk conditions in young children, their impact across developmental domains, and assessment procedures to identify needs and plan interventions in the early childhood years.

ECSE 312. Differentiated Instruction for Young Children with Special Needs. 3 Hours.
PR: SPED 304. This course is designed to prepare future general and special education teachers to differentiate instruction for students with exceptional learning needs. The course emphasizes the utilization of an individualized, data based decision-making process in the organization, adaptation, and implementation of methods, materials, and curriculum.

ECSE 314. Center-Based Programs Early Intervention. 3 Hours.
PR: SPED 304 and ECSE 312 and passing scores on all components of Core Praxis. This course is designed to examine policies and practices for center-based early childhood special education for young children from ages 3-6, and individual education plans and intervention programs to promote early learning and child-peer interactions in preschool settings.

ECSE 315. Home-Based Programs for Early Intervention. 3 Hours.
PR: SPED 304. This course is designed to show policies and practices for home-based early intervention for young children with special needs from ages 0-3; individual family service plans and intervention programs to support early development and parent-child interactions in the home setting.

ECSE 316. Behavior Support Young Children Special Needs. 3 Hours.
PR: SPED 304 and ECSE 312. Emotional and social development in young children; causes and characteristics of problem behaviors in early childhood; assessment of behavior; and positive behavior supports for individuals and groups in- home and center- based preschool settings.

ECSE 317. Technology for Young Children with/without Special Needs. 3 Hours.
PR: SPED 304. This course is designed to prepare future general and special education teachers to differentiate instruction for students with exceptional learning needs. The course emphasizes the utilization of an individualized, data based decision-making process in the organization, adaptation, and implementation of methods, materials, and curriculum.

EDHS 100. Orientation to Multidisciplinary Studies in Education and Human Services. 1 Hour.
Introduction to the Bachelor's degree in Multidisciplinary Studies in Education and Human Services, including information about education and human services fields, identification of post-graduation career opportunities, selection of minors to develop knowledge and skills, analysis of problems and issues in education and human services, participation in community service activities, and planning to meet program and university requirements for graduation.

EDHS 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

EDHS 200. Professional Inquiry in Education and Human Services. 3 Hours.
PR: ((ENGL 101 and ENGL 102) or ENGL 103) and EDHS 100. Examination of issues across the fields of education and human services; practical experience in and critical reflection on activities conducted in education and human services settings and their implications for personal and professional growth; development of higher level skills for written communication through submission, revision and resubmission of formal written professional products.

EDHS 489. Capstone Project: Multidisciplinary Studies in Education and Human Services. 3 Hours.
PR: Consent. Integration and application of knowledge and skills acquired in multiple disciplines to understand and respond to problems of professional practice in education and human services through researching information, communicating and collaborating with others, planning, preparing and delivering presentations and written products, giving and receiving performance feedback, and planning and preparing for a future professional career.

EDHS 493. Special Topics. 1-6 Hours.

EDP 101. Learning Strategies for Academic Success. 3 Hours.
The purpose of the course is to help students develop active learning strategies that are research-based and appropriate for the college curriculum that will enable them to achieve academic success.

EDP 102. Orientation to the Regents Bachelor of Arts. 1 Hour.
PR: Consent. An introduction to the Regents Bachelor of Arts Program (RBA), including the degree structure, benefits of the program, academic success plans, standardized awards, portfolio petitions, Areas of Emphasis, and RBA graduate pathways.

EDP 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

EDP 301. Learning in PreK-Adult Educational Settings. 3 Hours.
Examination and utilization of behavioral and cognitive learning models; consideration of learner characteristics and other factors affecting student learning.

EDP 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

EDP 401. RBA Portfolio Development. 2 Hours.
This course will assist RBA students with professional work experience to prepare and submit portfolios for College Equivalent Credits (CECs).

EDP 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

EDP 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

EDP 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

EDP 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

EDP 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

EDP 496. Senior Thesis. 1-3 Hours.
PR: Consent.

EDP 497. Research. 1-6 Hours.
Independent research projects.

EDP 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

EDUC 100. Education Colloquium. 1 Hour.
Components of and requirements for the teacher preparation program, including specializations, professional organizations, requirements for admission to the major, avenues to program completion, and requirements for work with children or youth.

EDUC 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

EDUC 200. Professional Inquiry in Education. 3 Hours.
PR: ENGL 101 and ENGL 102. The course provides an examination of issues that cut across the field of teaching and the institution of public education. This course also focuses on developing higher-level skills in written communication.

EDUC 205. Introduction to Teaching and Learning in Secondary Schools. 3 Hours.
This course provides an overview of key issues in teaching and learning within middle and high school settings. It explores the structure of secondary education, focusing on curriculum and pedagogy in core subject areas. Students will engage with theories of knowledge, knowing, and learning from multiple perspectives to consider goals for and approaches to teaching and learning.

EDUC 220. Creative Thinking: Strategies and Techniques. 3 Hours.
Creativity is an essential human talent. Organizations increasingly need people that understand the creative process, know how to apply creative strategies to problem solve, and develop climates that foster innovation. Through interactive engagement and discussion, students in this course will learn about major theories and paradigms in creativity and explore tools and techniques for fostering creativity in classrooms and organizations.

EDUC 232. Data Literacy: Strategies and Applications. 3 Hours.
This course is intended to provide students with the skills necessary to think critically about and with data. Students will analyze and critique data-based claims, consider the representation and use of data in a variety of contexts, interpret and produce methods of describing and visualizing data, and engage in data-informed decision making.

EDUC 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

EDUC 301. Learning in Educational Settings. 3 Hours.
Examination and utilization of behavioral and cognitive learning models; consideration of learner characteristics and other factors affecting student learning.

EDUC 304. Place-based and Emotionally Responsive Teaching. 3 Hours.
Place-based and Emotionally Responsive Teaching involves working with local communities to support teaching and learning. This course helps K-6 preservice teachers understand the potential of seeing education as situated in the context of community, family, and collegial partnerships. The course addresses the importance of emotionally responsive teaching to support elementary school children experiencing traumatic stress responses.

EDUC 311. Field Experience & Technology Applications in Elementary Schools 1. 2 Hours.
Application of models and paradigms of learning in content area and instructional technologies through tutoring of individuals and small groups in an assigned public school site.

EDUC 312. Field Experience & Technology Applications in Elementary Schools 2. 3 Hours.
PR: EDUC 311 with a minimum grade of C-. Application of paradigms of learning in content area and instructional technologies through tutoring of individuals and small groups in an assigned public school site.

EDUC 313. Field Experience & Technology Applications in Secondary Schools 1. 2 Hours.
Initial opportunities to apply and continue to develop skills, dispositions, and perspectives related to teaching and learning in middle and high schools through field experiences in an assigned public school site. Candidates will engage in observation, tutoring, and working with individuals and small groups of students, while also considering the use of technologies in instructional settings.

EDUC 314. Field Experience & Technology Applications in Secondary Schools 2. 2 Hours.
PR: EDUC 313 with a minimum grade of C-. Continued opportunities to apply and further develop skills, dispositions, and perspectives related to teaching and learning in middle and high schools through field experiences in an assigned public school site. Candidates will engage in observation, tutoring, and working with individuals and small groups of students, while also considering the use of technologies in instructional settings.

EDUC 330. Mathematics for Elementary Teachers 1. 3 Hours.
PR: MATH 124 or MATH 126. This course focuses on topics of mathematics in the elementary grades, how these concepts connect to mathematics on the horizon (grades 6-8 and beyond), and how teachers need to know the mathematical content they teach in specialized ways. The course includes topics in the domains of counting and cardinality, numbers and operations, algebraic thinking, and connections among mathematical concepts.

EDUC 331. Mathematics for Elementary Teachers 2. 3 Hours.
PR: EDUC 330. This course focuses on topics of mathematics in the elementary grades, how these concepts connect to mathematics on the horizon (grades 6-8 and beyond), and how teachers need to know the mathematical content they teach in specialized ways. The course includes topics in the domains of rational numbers, ratios, and proportional reasoning; geometry; measurement; statistics; and connections among mathematical concepts.

EDUC 332. Teaching and Learning Mathematics in Secondary Schools 1. 3 Hours.
PR: EDUC 205 with a minimum grade of C-. This course explores effective methods and skills needed for teaching mathematics in middle and high schools. Students will apply mathematical content knowledge to interpret state standards, create lesson plans, and analyze student thinking. Topics include classroom management, creating supportive learning environments, engaging students through instructional routines, and aligning assessments to goals.

EDUC 339. Mathematics & Science Methods for Secondary Teachers 1. 3 Hours.
PR: EDUC 205 with a minimum grade of C-. This course explores effective methods and skills needed for teaching mathematics and science in middle and high schools. Students will apply content knowledge to interpret state standards, create lesson plans, and analyze student thinking. Topics include classroom management, creating supportive learning environments, engaging students through instructional routines, and aligning assessments to goals.

EDUC 340. Science for Elementary Educators. 3 Hours.
An understanding of science and engineering content and practices is foundational to becoming a well-rounded elementary teacher. This course will integrate Earth and Space, Life, and Physical Sciences through the use of the NGSS cross-cutting concepts, including: patterns; cause and effect; scale, proportion, and quantity; systems and system models; Energy and matter; structure and function; and stability and change.

EDUC 342. Teaching & Learning Science in Secondary Schools 1. 3 Hours.
PR: EDUC 205 with a minimum grade of C-. Course will address topics specific to teaching and learning of science content at the secondary school level. Issues of learning environment, teaching, learning, assessment and professional dispositions will be addressed.

EDUC 350. Social Studies Content for Elementary Teachers. 3 Hours.
This course focuses on the specialized content knowledge needed to effectively teach elementary social studies. Course topics address essential areas of elementary social studies curriculum, including history, government and citizenship, human and physical geography, and economics.

EDUC 400. Instructional Design and Evaluation. 3 Hours.
PR: Admission to the major and a grade of a C or better in EDUC 301. Examination and demonstration of teacher behaviors required to plan classroom instruction, assess student learning, and evaluate instruction; emphasis on instruction, assessment, and evaluation to accommodate a wide range of student needs.

EDUC 401. Managing and Organizing Learning Environments. 3 Hours.
PR: Admission to the major and a grade of C or better in EDUC 400 and PR or CONC: EDUC 410. Examination of research and practice in organizing and managing school learning environments to produce optimal learning; development of management systems congruent with personal philosophy, research, learner characteristics, and content area.

EDUC 408. Art Integration in the Elementary Classroom. 3 Hours.
This course explores the nature of creative thinking, meaningful integration of the arts, the impact of the arts on social awareness, and school-family-community connections built through creative learning experiences involving the arts in the elementary classroom.

EDUC 410. Clinical Experience in Elementary Schools/Residency 1. 5 Hours.
PR: EDUC 312 with a minimum grade of C-. The West Virginia Department of Education and West Virginia University both require that all students seeking initial certification in teacher education complete a two-semester supervised experience in a classroom setting, referred to as Residency. This course is the first semester of that residency experience. It is an intensive practical experience to prepare future educators for their chosen profession.

EDUC 411. Clinical Experience in Elementary Schools/Residency 2. 10 Hours.
PR: EDUC 410 with a minimum grade of C-. The West Virginia Department of Education and West Virginia University both require that all students seeking initial certification in teacher education complete a two-semester supervised experience in a classroom setting, referred to as Residency. This course is the second semester of that residency experience. It is a full-time practical experience to prepare future educators for their chosen profession.

EDUC 412. Clinical Experience in Secondary Schools/Residency 1. 5 Hours.
PR: EDUC 313 and EDUC 314 with a minimum grade of C- in each. The West Virginia Department of Education and West Virginia University both require that all students seeking initial certification in teacher education complete a two-semester supervised clinical experience in a classroom setting, referred to as Residency. This course is the first semester of that Residency experience—an intensive, practical experience to prepare future educators for their chosen profession.

EDUC 413. Clinical Experience in Secondary Schools/Residency 2. 9 Hours.
PR: EDUC 412 with a minimum grade of C-. The West Virginia Department of Education and West Virginia University both require that all students seeking initial certification in teacher education complete a two-semester supervised clinical experience in a classroom setting, referred to as Residency. This course is the second semester of that Residency experience—an intensive, full-time classroom experience to prepare future educators for their chosen profession.

EDUC 414. Promoting Creative Expression in Elementary Classrooms. 3 Hours.
PR: EDUC 312. Includes an examination of creative experiences for children in elementary school, pre-school - grade 6. Topics include the use of the creative arts in learning activities, curriculum development, and instructional strategies.

EDUC 430. Mathematics Methods for Elementary Teachers. 3 Hours.
PR or CONC: EDUC 330 with a minimum grade of C-. Students will examine the content and pedagogy appropriate for mathematics instruction in the elementary grades. Emphasis is placed on understanding and developing instructional approaches and practices that support meaningful learning for all students.

EDUC 432. Teaching and Learning Mathematics in Secondary Schools 2. 3 Hours.
PR: EDUC 332 or EDUC 339 with a minimum grade of C-. Building on foundational teaching skills, this course focuses on deeper analysis of state standards, progressions of student thinking, and effective instructional practices for secondary mathematics. Emphasis is placed on developing cohesive unit plans, establishing positive learning environments, implementing student-centered activities, analyzing student data, and addressing personal professional development needs to foster continued growth in teaching mathematics.

EDUC 436. Standards & Curriculum in Secondary Mathematics: Ratios & Proportional Reasoning. 3 Hours.
A focus on the development of specialized content knowledge as well as curricular implications related to the teaching and learning of rational numbers, ratios, and proportional reasoning. Connected to state mathematics standards, the course emphasizes how these foundational topics are taught across middle and high school, including connections to other areas of mathematics such as algebra, geometry, and statistics.

EDUC 437. Standards & Curriculum in Secondary Mathematics: Geometric Thinking. 3 Hours.
A focus on the development of specialized content knowledge as well as curricular implications, related to the teaching and learning of geometry and geometric thinking. Connected to state mathematics standards, the course emphasizes how these foundational topics are taught across middle and high school, including connections to other areas of mathematics, and how students develop mathematically.

EDUC 439. Mathematics & Science Methods for Secondary Teachers 2. 3 Hours.
PR: (EDUC 332 or EDUC 339 or EDUC 342) with a minimum grade of C-. Building on foundational skills, this course focuses on deeper analysis of state standards, progressions of student thinking, and effective instructional practices for secondary mathematics and science. Emphasis is placed on developing cohesive unit plans, establishing positive learning environments, implementing student-centered activities, analyzing student data, and addressing personal professional development needs to foster continued growth in teaching.

EDUC 440. Science Methods for Elementary Teachers. 3 Hours.
PR: EDUC 340 with a minimum grade of C-. Prepare students with the teaching and learning of elementary science through analysis of teaching methods/approaches, curriculum patterns, and trends in elementary school science.

EDUC 442. Teaching & Learning Science in Secondary Schools 2. 3 Hours.
PR: EDUC 339 or EDUC 342 with a minimum grade of C-. Building on foundational teaching skills, this course focuses on deeper analysis of state standards, progressions of student thinking, and effective instructional practices for secondary science. Emphasis is placed on developing cohesive unit plans, establishing positive learning environments, implementing student-centered and inquiry based activities, analyzing student data, and addressing individual professional development needs to foster continued growth in science teaching.

EDUC 445. Practical Applications in Science and Science Teaching. 3 Hours.
The course will explore a variety of practical applications of science and career opportunities in those areas of science for the purpose of incorporating them into their own teaching in secondary school science teaching. In this course students will look at the intersections of science, engineering, and society as it applies to teaching science.

EDUC 449. History & Philosophy of Science. 3 Hours.
This course will look at the historical and philosophical development of science as a discipline and as a way of knowing the world. There will be an emphasis on how major historical shifts have influenced current approaches in and understanding of science.

EDUC 450. Social Studies Methods for Elementary Teachers. 3 Hours.
PR: EDUC 350 with a minimum grade of C-. Students examine issues facing social studies education and evaluate and plan lessons and instructional activities that apply learning theory to the philosophy and standards of social studies education for all elementary students.

EDUC 460. Literacy 1: Exploring & Developing Literacy Foundations. 3 Hours.
This course establishes a historical understanding of literacy pedagogy, and creates opportunities for prospective teachers to explore and develop understandings of multiple literacies. It establishes foundational knowledge in scientifically-based literacy practices and provides prospective teachers with a strong foundation in the development of oral language, phonemic awareness, and phonics.

EDUC 461. Literacy 2: Reading Assessment & Instruction. 3 Hours.
PR: EDUC 460 with a minimum grade of C-. This course creates opportunities for prospective teachers to explore and develop theoretical and pedagogical foundations for creating learning environments and curricula that support K-5 students' development of reading. Course topics include the complexities and skills needed for learning to read, the cyclical nature of planning, instruction, and assessments in the classroom, and how to design a child-centered literacy curriculum.

EDUC 462. Literacy 3: Composing Texts. 3 Hours.
PR: EDUC 460 and EDUC 461 with a minimum grade of C- in each. This course creates opportunities for students to explore multiple theoretical/pedagogical foundations for creating equitable learning environments and writing curriculum. Students will explain how the philosophical stances/frameworks for instruction they choose support diverse K-5 students in constructing identities as writers, who critically engage with the world as they study/question/compose texts using multiple sign systems and modalities for multiple purposes and audiences.

EDUC 484. Residency/Technology Capstone in Elementary Education. 2 Hours.
PR: EDUC 410 with a minimum grade of C-. This course is the capstone experience for the Elementary Education program. It includes components that meet state required certification requirements including the submission for Performance Assessment exams required for certification. Students analyze their supervised teaching in an elementary school classroom (pK-6). The weekly seminar includes discussion of topics applicable to the classroom, technology, and analysis of planning, teaching, and assessment.

EDUC 485. Residency/Technology Capstone in Secondary Education. 3 Hours.
PR: C&I 491 with a minimum grade of C-. This course is the capstone experience for the Secondary Education programs. It includes components that meet state required certification requirements including the submission for Performance Assessment exams required for certification. Students analyze their supervised teaching in a middle/high school classroom. The weekly seminar includes discussion of topics applicable to the classroom, technology, and analysis of planning, teaching, and assessment.

EDUC 498. Honors. 1-3 Hours.
PR: Students in honors program and consent by the honors director. Independent reading, study or research.

EE 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

EE 221. Introduction to Electrical Engineering. 3 Hours.
PR: WVU and PSC sections require MATH 156 and PHYS 111, WVUIT sections require MATH 156. Electrical engineering units, circuit elements, circuit laws, measurement principles, mesh and node equations, network theorems, operational amplifier circuits, energy storage elements, sinusoids and phasors, sinusoidal steady state analysis, average and RMS values, complex power.

EE 221L. Introduction to Electrical Engineering Laboratory. 1 Hour.
PR or CONC: EE 221. Design and experimental exercises basic electrical circuits. Use of the digital computer to solve circuit problems.

EE 223. Electrical Circuits. 3 Hours.
PR: WVU and PSC sections require EE 221 and EE 221L and PHYS 112 and MATH 251 all with a minimum grade of C-, WVUIT sections require EE 221 and EE 221L and MATH 251 all with a minimum grade of C-. Time response of RC and RL circuits, unit step response, second order circuits, poly-phase systems, mutual inductance, complex frequency, network frequency response, two-port networks and transformers. Fourier methods and Laplace Transforms.

EE 223L. Electrical Circuits Laboratory. 1 Hour.
PR or CONC: EE 223. Design and experimental exercises in circuits. Transient circuits, steady state AC circuits, frequency response of networks. Use of digital computer to solve circuit problems.

EE 251. Digital Electronics. 3 Hours.
PR: CPE 271 and (EE 221 and PHYS 112 with a minimum grade of C- in both). Diode and bipolar and field-effect transistor device operation and switching models. Use of bipolar and field-effect transistors and diodes in switching and logic circuits. Switching circuits and logic gates including logic levels, circuit configuration, and interfacing.

EE 251L. Digital Electronics Laboratory. 1 Hour.
PR or CONC: EE 251. Design, fabrication, and measurement of digital electronic circuits. Modeling and use of discrete devices, logic gates, display devices in switching circuits and timer circuits, Interfacing with integrated logic gates.

EE 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

EE 327. Signals and Systems 1. 3 Hours.
PR: MATH 261 and EE 223. Introduction to linear system models and solutions in the time and frequency domains. Balanced emphasis is placed on both continuous and discrete time and frequency methods. (3 hr. lec.).

EE 329. Signals and Systems 2. 3 Hours.
PR: WVU sections require EE 327 and PR or CONC: STAT 215, WVUIT sections require EE 327 and MATH 448. Analysis of continuous and discrete time signals. Statistical description of nondeterministic signals, correlation functions, and spectral density with these concepts applied to communications and signal processing.

EE 329L. Signals and Systems Laboratory. 1 Hour.
PR: EE 327 and PR or CONC: EE 329. Laboratory experiments in measurement and analysis of systems and signals.

EE 335. Electromechanical Energy Conversion and Systems. 3 Hours.
PR: WVU sections require EE 223 and EE 223L and PHYS 112 and PR or CONC: EE 335L, WVUIT sections require EE 223 and EE 223L and PR or CONC: EE 345. Electric energy sources, fundamentals of electromechanical energy conversion, transformers and rotating machinery.

EE 335L. Electromechanical Energy Conversion and Systems Laboratory. 1 Hour.
PR or CONC: EE 335. Transformers, DC motors and generator performance and characteristics, synchronous machine performance and characteristics.

EE 345. Engineering Electromagnetics. 3 Hours.
PR: WVU sections require MATH 261 and PHYS 112, WVUIT sections require MATH 261 and PHYS 112 and EE 223. Continued use of vector calculus, electrostatics, magnetostatics, Maxwell's Equations, and boundary conditions. Introduction to electromagnetic waves, transmission lines, and radiation from antennas.

EE 355. Analog Electronics. 3 Hours.
PR: EE 223 and EE 251. Electronic devices in analog circuits. Small-signal and graphical analysis of BJT and FET circuits; frequency response, feedback, and stability. Linear and nonlinear operational amplifier circuits. Power amplifiers and power control by electronic devices.

EE 355L. Analog Electronics Laboratory. 1 Hour.
PR or CONC: EE 355. Design, fabrication, and measurement of analog electronic circuits. Use of discrete devices, integrated circuits, operational amplifiers, and power electronic devices. Study of biasing and stability, frequency response, filters, analog computation circuits, and power control circuits.

EE 411. Fundamentals of Control Systems. 3 Hours.
PR: EE 327. Introduction to classical and modern control; signal flow graphs; state-variable characterization; time-domain, root locus, and frequency techniques; stability criteria.

EE 413. Introduction to Digital Control. 3 Hours.
PR: EE 327. Sampling of continuous-time signals and transform analysis. Stat-variable analysis for linear discrete-time systems and design of digital controller. (3 hr. lec.).

EE 431. Electrical Power Distribution Systems. 3 Hours.
PR: EE 335 and EE 335L. General considerations; load characteristics; subtransmission and distribution substations; primary and secondary distribution, secondary network systems; distribution transformers; voltage regulation and application of capacitors; voltage fluctuations; protective device coordination.

EE 435. Introduction to Power Electronics. 3 Hours.
PR: WVU sections require EE 335 and EE 355 and EE 355L, WVUIT sections require EE 335 and EE 365 and EE 366. Application of power semiconductor components and devices to power system problems; power control; conditioning processing, and switching. Course supplemented by laboratory problems.

EE 436. Power Systems Analysis. 3 Hours.
PR: EE 335 and EE 335L. Power system network modeling, network calculations by matrices, node equations, node elimination, bus admittance, impedance matrices, and fault calculations. Transmission line inductance, capacitance, network models, and power circle diagrams. Symmetrical and unsymmetrical faults. Load flow and economic dispatch.

EE 437. Fiber Optics Communications. 3 Hours.
PR: EE 329 and EE 345. Fundamentals of optics and light wave propagation, guided wave propagation and optical wave guides, light sources and light detectors, couplers, connections, and fiber networks, modulation noise and detection in communication systems. (3 hr. lec.).

EE 438. Data Analytics for Secure Cyber-Power Systems. 3 Hours.
PR: EE 335 with a minimum grade of C-. Economic dispatch, transmission and distribution power flow, distribution management system, energy management system, generation management system, contingency selection, state estimation, bad data detection, unit committment, security constraint optimal power flow, demand response, impact of renewable integration, smart grid communication architecture, machine learning algorithms, network modeling tools, cyber security in smart grid.

EE 445. Introduction to Antennas. 3 Hours.
PR: EE 345 or equivalent. Development of Maxwell's equations and general electromagnetic theory underpinning broadcast communication systems, wave propagation, antennas and antenna arrays.

EE 450. Device Design and Integration. 3 Hours.
PR: EE 345 and EE 355. Fundamentals of semiconductor materials, p-n junctions, metal-semiconductor junctions, JFET's, MESFET's, MOSFET's, physical device design, device simulation, gate level & CMOS design and layout. (3 hr. lec.).

EE 455. Introduction to Microfabrication. 3 Hours.
PR: EE 355. Introduction to the physical processes underlying current and emerging microfabrication technology and their selective use in the technology computer aided design (TCAD) and fabrication of electrical, optical, and micromechanical devices and systems.

EE 461. Introduction to Communications Systems. 3 Hours.
PR: EE 329. Application of random processes and spectral analysis to the design and analysis of communication systems. Analysis and comparison of standard modulation techniques relative to bandwidth, noise, threshold, and hardware constraints.

EE 463. Digital Signal Processing Fundamentals. 3 Hours.
PR: MATH 251 and EE 327. Theories, techniques, and procedure used in analysis, design, and implementation of digital and sampled data filters. Algorithms and computer programming for software realization. Digital and sampled data realizations, switched capacitor and charge-coupled device IC's. (3 hr. lec.).

EE 465. Introduction to Digital Image Processing. 3 Hours.
PR: EE 327. Introduction to the vision process fundamental mathematical characterization of digitized images, two-dimensional transform methods used in image processing, histogram analysis and manipulation, image and filtering techniques, image segmentation, and morphology.

EE 467. Digital Speech Processing. 3 Hours.
PR: EE 327 and EE 329. Covers fundamentals in digital speech processing including production, speech analysis, speech coding, speech enhancement, speech recognition and speaker recognition. Emphasize hand-on experience of processing speech signals using MATLAB.

EE 480S. Capstone Project - Design. 3 Hours.
PR: ENGL 102 or ENGL 103. Penultimate semester. Group senior design projects with individual design assignments appropriate to student's discipline. Complete system-level designs of the subsequent semester's project presented in written proposals and oral presentations. (Equivalent to BIOM 480, CPE 480, CS 480, EE 480).

EE 481S. Capstone Project - Implementation. 3 Hours.
PR: EE 480 or EE 480S. Detailed design and implementation of the system including choice of components, algorithm development, interfacing, trouble shooting, working in groups, and project management. Also covers professional topics, including ethics, liability, safety, socio-legal issues, risks and employment agreements.

EE 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

EE 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

EE 492. Directed Study. 1-6 Hours.
Directed study, reading, and/or research.

EE 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

EE 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

EE 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

EE 496. Senior Thesis. 1-3 Hours.
PR: Consent.

EE 497. Research. 1-6 Hours.
Independent research projects.

EE 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ENCP 460. Sustainable Cities: Best Practices. 3 Hours.
Surveys basic concepts, theories, and metrics of measuring and evaluating the trends of urban sustainability; it profiles influential urban design and planning visionaries; and examines best practices in developing sustainable, smart, and resilient human-made space at the scale of a site, neighborhood, community, city, and region.

ENCP 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENGL 1C1. Introduction to Composition and Rhetoric. 3 Hours.
Studies the logical, rhetorical, and linguistic structures of expository prose; develops strategies for analyzing purposes, audiences, and conventions; emphasizes processes for drafting, revising, and editing. Required of all bachelor's degree candidates unless equivalent transfer credit or portfolio credit applies. Qualified students may complete ENGL 103 in place of ENGL 101 and 102. Co-requisites will differ at WVUIT and PSC.

ENGL 1C2. Composition, Rhetoric, and Research. 3 Hours.
PR: ENGL 101 or equiv. Builds on the writing abilities earned in English 101 (or the equivalent). Focuses on the research process, argumentation, and critical inquiry; emphasizes structures, language, documentation, and formats appropriate for specific audiences and purposes. Required of all bachelor's degree candidates unless equivalent transfer credit or portfolio credit applies.

ENGL 101. Introduction to Composition and Rhetoric. 3 Hours.
PR: Satisfactory ACT/SAT score. Studies the logical, rhetorical, and linguistic structures of expository prose; develops strategies for analyzing purposes, audiences, and conventions; emphasizes processes for drafting, revising, and editing. Required of all bachelor's degree candidates unless equivalent transfer credit or portfolio credit applies. Qualified students may complete ENGL 103 in place of ENGL 101 and 102. Co-requisites will differ at WVUIT and PSC.

ENGL 102. Composition, Rhetoric, and Research. 3 Hours.
PR: ENGL 101 or ENGL 1C1 or equiv. Builds on the writing abilities earned in English 101 (or ENGL 1C1 or the equivalent). Focuses on the research process, argumentation, and critical inquiry; emphasizes structures, language, documentation, and formats appropriate for specific audiences and purposes. Required of all bachelor's degree candidates unless equivalent transfer credit or portfolio credit applies.

ENGL 103. Accelerated Academic Writing. 3 Hours.
PR: Qualifying ACT/SAT verbal score. For students who qualify based on high ACT/SAT verbal scores, English 103 satisfies WVU's introductory writing requirement (English 101 and 102) in a single course. English 103 emphasizes both expository writing and researched argument writing. Students develop the organization, revision, and editing strategies needed to respond to a variety of writing situations, audiences, and purposes.

ENGL 111. Introduction to Creative Writing. 3 Hours.
Instruction in reading and writing fiction, nonfiction and poetry in order to enhance creative writing skills.

ENGL 131. Poetry and Drama. 3 Hours.
An introduction to the genres.

ENGL 132. Short Story and Novel. 3 Hours.
An introduction to the genres.

ENGL 139. Contemporary African Literature. 3 Hours.
A survey of contemporary African poetry, drama, and fiction.

ENGL 154. African American Literature. 3 Hours.
A historical introduction and survey from its beginnings to the present.

ENGL 156. Literature of Native America. 3 Hours.
A historical survey of Native American prose, poetry, song, and story from the beginning to the present.

ENGL 170. Literature of Minds and Selves. 3 Hours.
This course explores the nature of consciousness, selfhood, and humanness through literary and filmic representations of thought and character, especially those that deviate from the norm. Topics will vary by semester and might include disability, trauma, monstrosity, criminality, human rights, queer characters, children's literature, posthumanism, or animal studies, among others.

ENGL 171. Literature of Science and Nature. 3 Hours.
Analyzes the representation of science and nature in literature and film across historical periods and genres.

ENGL 172. Literature of the Human Body. 3 Hours.
Analyzes representations of the human body and its biological and psychological development and decline through literary, expository, and other cultural texts.

ENGL 180. Literature of Love, Sex, and Gender. 3 Hours.
Analyzes representations of love in literature and film across historical periods and genres, with particular attention to narrative representations of sex, gender, and sexual identity.

ENGL 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

ENGL 199. Orientation to English Studies. 1,2 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities and opportunities.

ENGL 200. Foundations of Literary Study. 3 Hours.
Study and practice of the analytical, research, and writing skills fundamental to literary studies.

ENGL 211. Sturm Workshop. 1 Hour.
PR: Consent. Creative writing workshop conducted by Sturm visiting writer in residence.

ENGL 212. Creative Writing: Fiction. 3 Hours.
An open enrollment introduction to the writing of fiction.

ENGL 213. Creative Writing: Poetry. 3 Hours.
An open enrollment introduction to the writing of poetry; practice in the basics of image, metaphor, line, form, sound and voice.

ENGL 214. Creative Writing: Non-Fiction. 3 Hours.
Introductory course in the writing of non-fiction.

ENGL 221. The English Language. 3 Hours.
PR: ENGL 101 and sophomore standing. An introduction to language, its structure in the mind, and its use in the United States.

ENGL 226. Non-Western World Literature. 3 Hours.
Selected readings in non-Western world literature, ancient and modern.

ENGL 229. Literary Contexts Abroad. 1-3 Hours.
PR: Consent. Global learning experience combines travel with cultural learning and literary and film analysis with particular emphasis on cultural understanding and social traditions. Location will vary.

ENGL 230. Film Studies. 3 Hours.
Topics in the study of film, or film and literature, in a historical, theoretical and/or cultural context.

ENGL 232. Poetry. 3 Hours.
Appreciation and enjoyment of poems through critical and analytical reading. Studies in the various types of poetry, and of the language, imagery, and techniques of poetic expression.

ENGL 233. The Short Story. 3 Hours.
The short story's structure, history, and contemporary forms.

ENGL 234. Drama. 3 Hours.
The drama's structure, history, and contemporary forms.

ENGL 235. Novel. 3 Hours.
The novel's structure, history, and contemporary forms.

ENGL 236. The Bible as Literature. 3 Hours.
Analysis of the themes, topics and literary genres of the Old and New Testaments. Issues to be discussed include the unity of the text, the status of authorship, translation, and the depiction of God.

ENGL 238. Literature of Place. 3 Hours.
Topics in the study of literature of place in a historical, theoretical, and/or historical context.

ENGL 241. American Literature 1. 3 Hours.
A historical introduction and survey from its beginnings to the mid-nineteenth century.

ENGL 242. American Literature 2. 3 Hours.
A historical introduction and survey from the mid-nineteenth century to the present.

ENGL 251. American Folklore and Culture. 3 Hours.
Introduction to folklore of the USA. Folklore and American culture. Subject groups vary but usually include Native Americans, early European settlers, African Americans, and 20th century immigrants.

ENGL 252. Appalachian Fiction. 3 Hours.
Reading of short stories, novels, and other narratives by Appalachian authors.

ENGL 254. African American Literature. 3 Hours.
Studies in the literature of African American authors, 1845 to the present.

ENGL 255. Multiethnic Literature. 3 Hours.
This course examines literature by Americans of diverse ethnicities including, but not limited to, Asian Americans, Latinos, Native Americans, African Americans, and European Americans of various class/religious/regional backgrounds.

ENGL 257. Science Fiction and Fantasy. 3 Hours.
A study of the history and nature of science fiction from H. G. Wells to the present, with special attention to features of prose narration.

ENGL 258. Popular American Culture. 3 Hours.
A survey of modern popular American culture from 1940 to the present, with special emphasis on popular literature, music, television, movies, radio in its golden age, and comic books.

ENGL 261. British Literature 1. 3 Hours.
A historical introduction and survey from the Middle Ages through the eighteenth century.

ENGL 262. British Literature 2. 3 Hours.
A historical introduction and survey from the late eighteenth century to the present.

ENGL 263. Shakespeare 1. 3 Hours.
Several of Shakespeare's most important plays.

ENGL 272. Modern Literature. 3 Hours.
British and American poetry, drama, and fiction from 1900 to 1960.

ENGL 273. Contemporary Literature. 3 Hours.
An examination of the literature written since 1960 in England and America. Poetry, drama, and fiction. Selections will vary depending on the instructor.

ENGL 275. Justice and Literature. 3 Hours.
An exploration of the concept and practice of justice through a study of literature. Literary works draw from history, theology, philosophy, and legal cases to illustrate the complexity of justice. How has literature reflected and produced understandings of justice? Time period and regional, national, or global focus will vary by instructor.

ENGL 277. Reading Publics: Exploring the Humanities in Public Spaces. 3 Hours.
Reading Publics introduces students to the powerful ways literature and literacy initiatives improve the local community, preserve cultural heritage, and enrich democracy. Students will complete service learning projects in the local community while also reading related works of fiction and non-fiction.

ENGL 285. Images of Women in Literature. 3 Hours.
Representative literary works studied against a backdrop of social and historical documents to examine the effect of images of women in literature on the self-image of women today.

ENGL 288. Gender and Sexuality in Literature and Film. 3 Hours.
Representations of sexual and gender diversity in literature and film, including of lesbian, gay, bisexual, transgender, queer, and intersex people.

ENGL 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENGL 298. Honors. 1-3 Hours.
PR: Consent. Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ENGL 309. Approaches to Teaching Composition. 3 Hours.
PR: ENGL 200. (May not be taken for both undergraduate and graduate credit.) Surveys attitudes toward and techniques of teaching writing in elementary and secondary schools. Provides experiment in class with methods of teaching writing.

ENGL 312. Creative Writing Workshop: Fiction. 3 Hours.
PR: (ENGL 212 or ENGL 213 or ENGL 214) with a minimum grade of C-. Advanced workshop in creative writing for students seriously engaged in writing fiction.

ENGL 313. Creative Writing Workshop: Poetry. 3 Hours.
PR: (ENGL 212 or ENGL 213 or ENGL 214) with a minimum grade of C-. Advanced workshop in creative writing for students seriously engaged in the writing of a major group of poems.

ENGL 314. Creative Writing Workshop: Non-Fiction. 3 Hours.
PR: (ENGL 212 or ENGL 213 or ENGL 214) with a minimum grade of C-. Advanced workshop in creative writing for students seriously engaged in the writing of nonfiction.

ENGL 318. Topics in Creative Writing. 3 Hours.
PR: (ENGL 212 or ENGL 213 or ENGL 214) with a minimum grade of C-. Advanced work in creative writing; course content changes with genre: fiction, poetry, non-fiction. (May be repeated for a maximum of 9 hours.).

ENGL 321. History of the English Language. 3 Hours.
PR: ENGL 221 or LING 101 or LING 311 or instructor's permission. Study of the nature of the language; questions of origins, language families, development, relationships of English as one of the Indo-European languages.

ENGL 329. Topics in English Language. 3 Hours.
This course rotates a set of topics offering students field- specific approaches to the study of the English language. Students engage the language through active research paradigms focusing on the social context of the language.

ENGL 331. Topics in Genre. 3 Hours.
This variable-topic course will trace formal and thematic conventions in poetry, drama, prose, fiction, and/or nonfiction.

ENGL 337. Study of a Major Author. 3 Hours.
PR: ENGL 102 or ENGL 103. May be repeated for a maximum of 6 credit hours. Study a single author's works with special attention to historical contexts and critical reception. Authors will vary.

ENGL 338. Environmental Criticism. 3 Hours.
PR: ENGL 102 or ENGL 103. This course provides methods for exploring connections between literature and the environment. Topics include nature writing; animal studies; environmental justice; urban ecocriticism; literary cartography; ecological theory.

ENGL 339. Theatre Tour. 3 Hours.
Introduces students to texts in performance by reading dramatic texts and traveling to see those texts in performance. Performance sites may include either international or U.S. locations.

ENGL 339A. Theatre Tour Travel. 1 Hour.
Must be taken with ENGL 339.

ENGL 342. American Drama. 3 Hours.
Representative American dramas and history of theatre in America.

ENGL 343. American Poetry. 3 Hours.
Major American poets of the nineteenth and twentieth centuries.

ENGL 344. Modern American Poetics. 3 Hours.
A close study of those poets who have shaped the aesthetics of contemporary American poetry.

ENGL 345. American Literature to 1800. 3 Hours.
Major genres, authors, themes, and topics in American literature, c. 1500 to 1800.

ENGL 346. American Literature 1800-1865. 3 Hours.
Major genres, authors, themes and topics in American Literature from 1800 to 1865.

ENGL 347. American Literature 1865-1915. 3 Hours.
Major genres, authors, themes, and topics in American Literature from 1865 to 1915.

ENGL 348. Twentieth Century American Literature. 3 Hours.
Major genres, authors, themes, and topics in American literature from 1900 to 1999.

ENGL 349. Contemporary American Literature. 3 Hours.
Completes the American literature sequence with an examination of stories, novels, poetry and drama (stage and screen) of the period from 1960 to present.

ENGL 351. Folk Literature. 3 Hours.
A close study of a range of narrative folklore genres, which may include tales, myths, legends, ballads, proverbs, riddles, jokes, and other forms.

ENGL 352. Topics in Appalachian Studies. 3 Hours.
Studies of authors, genres, themes, or topics in Appalachian literature.

ENGL 355. Topics in Multiethnic Literature. 3 Hours.
PR: ENGL 102 or ENGL 103. Specialized topics course reflective of current issues in multiethnic literature and culture. Topics vary per semester.

ENGL 356. Topics in Native American Literature. 3 Hours.
Specialized topics courses reflecting current trends and issues in Native American literature and culture. Subjects vary per semester.

ENGL 360. Literature of the Middle Ages. 3 Hours.
Literature of the period 1066-1485 in relation to the cultural transformations of the time. Course emphases may include (but are not limited to) Arthurian romance, the "mystery" plays, crusade narratives, political ballads, and women's writings.

ENGL 361. Chaucer. 3 Hours.
Early poems, Troilus and Criseyde, and The Canterbury Tales. In addition to an understanding and appreciation of Chaucer's works, the student is expected to acquire an adequate knowledge of Chaucer's language.

ENGL 363. Shakespeare 2. 3 Hours.
Advanced studies in Shakespeare's plays and non-dramatic poetry. Methodological emphases vary per semester, including textual, historical, dramaturgical and postcolonial approaches.

ENGL 364. Literature of the Seventeenth Century. 3 Hours.
Studies from Donne to Dryden.

ENGL 365. Milton. 3 Hours.
All of Milton's poems and a few selected prose works.

ENGL 366. Literature of the Eighteenth Century 1. 3 Hours.
Literature of the period 1660-1744 in relation to social, political, and religious movements of the time.

ENGL 367. Literature of the Eighteenth Century 2. 3 Hours.
Continuation of ENGL 366, covering the latter half of the century. May be taken independently of ENGL 366.

ENGL 368. The Romantic Movement. 3 Hours.
A survey of the works of the major British Romantic writers along with an introduction to works of scholarship in British Romanticism.

ENGL 369. Victorian Literature. 3 Hours.
Study of Victorian poets and prose writers with an emphasis on historical, political, and cultural issues. Representative authors may include: Tennyson, the Brownings, Arnold, Dickens, the Brontes, Eliot, and Hardy.

ENGL 371. Modern British/Irish Literature. 3 Hours.
Studies in the late 19th- and 20th-century British and Irish literature, including the works of Yeats, Eliot, Joyce, Woolf, Auden, Beckett, Hughes, Churchill, and Heaney.

ENGL 373. Contemporary British Literature. 3 Hours.
The poems, plays, and fiction read in this course reflect Britain's current multicultural makeup: among them, the North and the Republic of Ireland, Scotland, Wales, England, South Africa, Pakistan, and India.

ENGL 374. Global Anglophone Literature. 3 Hours.
Address various issues in global Anglophone literature, including colonialism, imperialism, gender, nationalism, resistance, development, neocolonialism and diasporic identities. Examination of contemporary literary modes associated with the postcolonial project of revisionist history.

ENGL 382. Contemporary Literary Theory. 3 Hours.
An introduction to the predominant schools of literary theory of the twentieth century, including psychoanalytic criticism, Marxist criticism, feminist criticism, deconstruction, postmodernism, and cultural studies.

ENGL 383. Introduction to Cultural Studies. 3 Hours.
Students will explore the ways in which we are all simultaneously users of and used by culture, and the ways in which cultural practices influence how we think, feel, and act in everyday life.

ENGL 384. Introduction to American Studies. 3 Hours.
This course introduces students to methodologies of studying American popular and mass cultures in the past and present. Topics may include film, literature, performance, music, economics, and technology.

ENGL 385. American Women Writers. 3 Hours.
Studies in the literature of American women writers. Syllabi may vary per term; topics may include Jewish American women writers, women writers of the suffrage movement, and 20th century American women writers.

ENGL 386. British Women Writers. 3 Hours.
This course examines fiction, poems, essays, and drama written by British women writers, beginning with the fourteenth-century author Margery Kempe and continuing into the late twentieth century with Nadine Gordimer.

ENGL 387. Topics in Women's Literature. 3 Hours.
Syllabus will vary per term. Topics include women writers outside of Great Britain and the United States; comparative women writers; women's writing on a particular theme or topic.

ENGL 388. Topics in Gay/Lesbian Studies. 3 Hours.
Specialized topics courses reflecting current trends in studies of gay/lesbian history, literature, culture, and theory. Subjects will be taught on a rotation.

ENGL 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENGL 405. Young Adult Literature. 3 Hours.
A survey of young-adult literature with special attention to literary theories and methodologies that assist its interpretation.

ENGL 418. Creative Writing Seminar. 3 Hours.
PR: 9 hours of creative writing and consent. Individual projects in creative writing pursued in a workshop setting.

ENGL 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ENGL 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ENGL 491A. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ENGL 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENGL 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual interest to students and faculty.

ENGL 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ENGL 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ENGL 497. Research. 1-6 Hours.
Independent research projects.

ENGL 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ENGL 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

ENGR 100. Introduction to Engineering Applications. 3 Hours.
PR or CONC: MATH 129 or MATH 153. Introduction to basic problem solving of engineering applications using algebra and trigonometry.

ENGR 101. Engineering Problem Solving 1. 2 Hours.
PR or CONC: MATH 128 or MATH 129 or MATH 150 or MATH 155. Engineering problem solving methodologies and analysis. Use of computers in problem solving, technical report writing, team based project work and presentations.

ENGR 102. Engineering Problem Solving 2. 3 Hours.
PR: ENGR 101 and (MATH 128 or MATH 129 or MATH 150 or MATH 155) with a minimum grade of C- in each. Continued development of engineering problem-solving, teamwork, and communication skills with emphases on using the computer as a tool and algorithm development with a high-level language such as MATLAB.

ENGR 103. Introduction to Nanotechnology Design. 3 Hours.
PR: ENGR 101 and (MATH 154 or MATH 155) with a minimum grade of C- in each. Continued development of engineering problem-solving, teamwork, and communication skills with emphasis on the fundamentals of nanotechnology design, using the computer as a tool, and algorithm development with a high-level language such as MATLAB.

ENGR 112. Professional Development in Engineering. 2 Hours.
Professional development and academic success strategies for first-year students enrolled in the Freshman Engineering summer bridge program - Academy of Engineering Success (AcES).

ENGR 129. Engineering Mathematics. 1 Hour.
PR: Consent. Review of key pre-calculus and early calculus concepts and topics for engineering students.

ENGR 140. Engineering in History. 3 Hours.
Impact of engineering on society throughout history. Developments in warfare, architecture, agriculture, manufacturing, communication, transportation, and their impacts on society.

ENGR 142. Engineering Seminar. 1 Hour.
Faculty, alumni, graduate students, and industry representatives will provide presentations on various engineering research, career, and experience topics. Students will reflect and discuss the presentations on instructor monitored discussion boards.

ENGR 143. Engineering Concepts. 3 Hours.
Course covers engineering approaches to problem solving, design process, understanding technical communication, estimation, international standards and units, manufacturing processes and intellectual property, useful to students pursuing a career related to the engineering profession. Introduces the engineering disciplines and areas of application.

ENGR 150. Academic Success Skills. 1 Hour.
The development of academic skills that are needed to be a successful engineering student.

ENGR 151. Introduction to Engineering Reasoning. 3 Hours.
PR or CONC: MATH 126. An introduction to skills of critical reasoning. Application of reasoning skills to engineering problem solving, research and experimentation in engineering, and to the engineering design process. The course emphasizes the importance of elements of thought, universal intellectual standards, and essential intellectual traits in reasoning.

ENGR 155. Spatial Visualization. 1 Hour.
Introductory course offered to engineering students to strengthen their spatial thinking skills. These 3D visualization skills are beneficial for future engineering classes. Topics Include: isometric drawing, orthographic projections, 3D object rotations, flat pattern developments, and surfaces and solids of revolution.

ENGR 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

ENGR 199. Orientation to Engineering. 1 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, students' responsibilities, and opportunities. Development of academic success strategies and University experiences to equip students to make life decisions.

ENGR 210. Engineering Decision Making. 2 Hours.
PR: ENGR 143. Examines engineering ethics, critical reasoning, and problem solving. Applies these ideas to questions, challenges, and issues in a variety of areas, including engineering applications. Covers important and controversial decisions made previously in the engineering field, and the related impacts and consequences.

ENGR 230. Exploring Culture and Technology of Germany Study Abroad. 3 Hours.
PR: Consent. Expose students to engineering as a global profession including language, culture, customs, and history of Germany, especially relating to engineering, through travel to Germany to visit factories, museums and universities.

ENGR 280. Sophomore Nanoscience Seminar. 1 Hour.
PR: ENGR 103. Introduces students to the original nanoscale science and engineering literature, including research on social, ethical and economic issues, and develops skills in interdisciplinary team building.

ENGR 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENGR 310. Energy Engineering. 3 Hours.
An introduction to the basic principles governing energy use, energy sources, and the impact of energy production on the environment. Examines the amount of energy used by society, fossil fuels and alternative energy sources, and methods of energy production.

ENGR 380. Junior Nanoscience Seminar 1. 1 Hour.
PR: ENGR 280. Familiarizes students with science and engineering that is being carried out in the laboratories at WVU, and helps students understand the importance of other disciplinary approaches to Nanoscale Science and Engineering.

ENGR 381. Junior Nanoscience Seminar 2. 1 Hour.
PR: ENGR 380. This course matches students with appropriate host laboratories in preparation for their senior research project. It fosters appreciation for the importance of the disciplinary fundamentals learned in the development of nanoscale science and engineering.

ENGR 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENGR 450. Technology Entrepreneurship and Enterprise Development. 3 Hours.
PR: Senior level or consent. Introduction to concepts, methods, and strategies involved in starting a successful business that is based upon new technology, products, and services. The course assists in identifying opportunities for existing markets, understanding how investors look at technology companies, managing intellectual property, financial and legal issues, commercializing real technologies, and information required for preparing a business plan to guide the enterprise.

ENGR 463. Find an Engineering Job/Internship. 1 Hour.
Assist engineering or computer science students in finding an engineering job or internship. Topics covered are resume and cover letter writing, interviewing skills, looking for a job, and assessing job offers.

ENGR 470. Fluid Mechanics Videos 1. 1 Hour.
Videos and discussion illustrate phenomena such as turbulence, compressibility and surface tension. Supplements MAE 331 and MAE 335 and CE 321 and CE 322 and CE 522. Does not satisfy AE, CE or ME technical elective requirement.

ENGR 471. Fluid Mechanics Videos 2. 1 Hour.
Videos and discussion illustrate phenomena such as turbulence, compressibility and surface tension. Supplements MAE 331 and MAE 335 and CE 321, CE 322 and CE 522. Does not satisfy AE, CE, or ME technical elective requirement.

ENGR 488. Cooperative (Co-Op) Education Experience. 1 Hour.
PR: Consent. Prearranged co-op experience in student's major. Involves placement in public or private enterprise, supervision, and evaluation for credit by faculty and employer.

ENGR 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ENGR 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENGR 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ENGR 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ENGR 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ENGR 497. Research. 1-6 Hours.
Independent research projects.

ENGR 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ENLM 150. Introduction to Environmental, Energy, and Land Management. 3 Hours.
Overview of land management and procurement careers including environmental, energy, and public infrastructure. Addresses the technical concepts and career opportunities in each area. Emphasis on providing guidance for success in completing undergraduate studies. Course will also introduce land development processes related to environmental and conservation opportunities as well as a multitude of energy sources.

ENLM 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

ENLM 200. Principles of Environmental, Energy, and Land Management. 3 Hours.
The science of land management with emphasis on the administration of land resources associated with environmental management and energy development. Recognition of complexities in land development and examination of ownership management techniques in traditional and renewable energy systems.

ENLM 220. Energy Production & Operations. 3 Hours.
Overview of land development with a focus on technical and cost details associated with energy and related systems. Includes an overview of energy units and production terminology as well as an understanding of the techno-economic aspects related to the development. Will also cover land resources needed for each development and how land cost and availability factor into decision making processes.

ENLM 250. Managing Non-Technical Risks. 3 Hours.
Identification, management, and communication of social risks in energy management. Exploration of media relations, crisis communication, advocacy, community education, and government relations as they relate to the energy industry. Risk management and communication skills development through case studies, presentations, and experiential exercises.

ENLM 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENLM 300. Ethics and Negotiations for Land Managers. 3 Hours.
This course provides an overview of the fundamental components of negotiation, with a particular focus on negotiating positions, techniques, and styles, as they pertain to land-based negotiations. The course emphasizes the importance of considering the legal, social, and ethical aspects of negotiation in the context of contemporary land, energy, environmental, and sustainable energy scenarios.

ENLM 390. Land and Lease Analysis. 3 Hours.
PR: ENLM 200 with a minimum grade of C-. This course will cover the theory and practice of real property title and genealogical research. Students will be required to complete and construct a mineral title packet; demonstrate analysis and drafting of energy and land related leases; and develop a solid foundation in heirship research. Students will also develop skills managing complex land records using software systems.

ENLM 393. Special Topics. 1-6 Hours.
Investigation of topics not covered in regularly scheduled courses.

ENLM 400. Land Management Contracts 1. 3 Hours.
PR: ENLM 300 with a minimum grade of C-. Introduction to mineral and environmental law with specific emphasis on titles, deeds, and leasing instruments commonly used in an exploration effort. Examination of land ownership, estates, land measurement, and leasing including a broad overview of the role of the land manager during the exploration and development of energy resources.

ENLM 415. Midstream Energy Planning and Development. 3 Hours.
The science of midstream energy with a focus on site and transportation infrastructure development and best management practices for minimizing potential surface and water impacts. Students will review complexities of energy systems with an emphasis on procuring rights and agreements, the regulatory framework, and techniques for reducing environmental impacts of midstream development in both traditional and renewable energy systems.

ENLM 420. Land Management Contracts 2. 3 Hours.
Continuation of energy contracts with emphasis on lease examination, execution, payment, and development. Complexities of lease management and permitting including an overview of federal, state, and local regulations and how they pertain to energy development.

ENLM 430. Nature-Based Land Development. 3 Hours.
This course focuses on developing and evaluating land for nature-based solutions. Students will explore innovative approaches to harness nature's potential for sustainable development, emphasizing nature-based carbon programs, bioenergy and bioproducts opportunities, biodiversity credits, and financing strategies. Through collaborative learning and practical projects, students will gain the skills needed to be a leader in nature-based development.

ENLM 441. Applied Geographic Information Systems and Energy Land Management. 1 Hour.
PR or CONC: RESM 440. Use of Geographic Information Systems (GIS) foundations to solve problems related directly to Energy Land Management. Incorporation of GIS skills in a holistic manner to develop spatial solutions to a real-world challenge in the planning, acquisition, and development of a petroleum/natural gas resource play.

ENLM 442. GIS Skills for Energy Land Management. 3 Hours.
PR: ENLM 200 with a minimum grade of C-. This class will provide students with background in the use of fundamental GIS skills to solve problems directly related to Energy Land Management. GIS skills will be used to develop spatial solutions to a real-world challenge in the planning, acquisition, and development of a petroleum/natural gas resource play.

ENLM 450. Land Management Strategic Planning. 3 Hours.
PR: ENLM 420 with a minimum grade of C-. This course will prepare students for the challenges faced when developing land and natural resources from initial definition to production, to division orders and revenue distribution. This course is designed to provide students with a comprehensive understanding of the complexities of developing land and natural resources, with a focus on responsible and sustainable operational practices.

ENLM 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ENLM 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated for a maximum of 18 Hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ENLM 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENLM 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ENLM 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ENLM 497. Research. 1-6 Hours.

ENTO 101. Bugs and Humans. 3 Hours.
"Bugs" or insects will be related to humans; their impact on human civilization and religion, the impact of insect-borne diseases on human society and history, development of insect societies, and edible insects will be presented.

ENTO 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENTO 301. Apiculture. 3 Hours.
PR: BIOL 101 and BIOL 103 and BIOL 102 and BIOL 104. Development, physiology, and behavior of the honey bee with emphasis on colony management, pollination of crops, diseases of bees, properties of honey and beeswax, and marketing of honey bee products.

ENTO 302. Apiculture Laboratory. 1 Hour.
PR or CONC: ENTO 301. Identification and anatomy of honey bees, assembly and use of beekeeping equipment, field management of honey bees, examination for diseases and pests, production of queens and nuclei. (1-3 hr. lab.).

ENTO 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENTO 401. Forensic Entomology. 3 Hours.
Study of entomology in legal investigations; processing of specimens at crime scene /morgue; identification of arthropods from forensic cases; determination of post-mortem intervals; evaluation of case studies.

ENTO 404. Principles of Entomology. 3 Hours.
PR: (BIOL 101 and BIOL 101L and BIOL 102 and BIOL 102L) or (BIOL 115 and BIOL 115L) and PR or CONC: ENTO 404L. Basic course dealing with the anatomy, morphology, physiology, reproduction, systematics, ecology, and management of insects.

ENTO 404L. Principles of Entomology Laboratory. 1 Hour.
PR or CONC: ENTO 404. Principles of Entomology - ENTO 404 Laboratory.

ENTO 412. Pest Management. 4 Hours.
PR: ENTO 404 or consent. An in-depth look at current problems and solutions in controlling insect pests in an environmentally compatible manner. Management techniques include cultural, mechanical, physical, biological, regulatory, and chemical practices. (Also listed as ENVP 412.).

ENTO 450. Insect Ecology. 3 Hours.
PR: ENTO 404 or consent. Ecology of insects as individuals, populations, and components of communities and ecosystems. Emphasis on the role of insects in agroecosystems and applications of insect ecology.

ENTO 470. Forest Pest Management. 4 Hours.
PR: FMAN 311 and (BIOL 101 and BIOL 103 and PLSC 206) or (BIOL 115 and and BIOL 117). Relationship of insects and disease organisms to the forest ecosystem; recognition of agents that affect forest health; management strategies for regulating their damage. (Also listed as PPTH 470.).

ENTO 471. Urban Tree and Shrub Health. 1 Hour.
PR: PPTH 470 or ENTO 470 or (PPTH 401 and ENTO 404). Presents the unique problems associated with managing trees and woody shrubs in an urban environment; management options will be evaluated.

ENTO 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ENTO 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ENTO 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENTO 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ENTO 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ENTO 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ENTO 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ENTR 102. Fundamentals of Entrepreneurship. 3 Hours.
Students will develop a fundamental understanding of how to develop an entrepreneurial mindset that can benefit them regardless of their major field of study in a wide variety of life settings. Students will also develop a fundamental understanding of how to create, develop, evaluate, act on, and support entrepreneurial opportunities. Exposure will be gained to innovative ecosystems throughout the university.

ENTR 202. Impact Challenge. 1 Hour.
Course participants will learn how to form well rounded interdisciplinary teams, research problems, identify solutions, and move towards implementation. Students in this course will gain entrepreneurship, communication and leadership skills that will prepare them to innovate the way our societies function in the future.

ENTR 203. Data Analysis for Problem Solving. 3 Hours.
Students will engage in problem identification through empathy mapping, idea development for problem solving, primary and secondary customer research, data analysis of their research findings, and communication of their findings in both oral and written methods.

ENTR 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENTR 400. Advanced Concepts in Entrepreneurship. 3 Hours.
PR: Sophomore standing. The purpose of this course is to help students identify and validate at least one entrepreneurial idea they are passionate about pursuing. Students will learn to apply the latest developments in entrepreneurship theory directly to their own idea, will learn how to generate new entrepreneurial ideas and how to identify and resolve critical assumptions by developing and testing hypotheses.

ENTR 405. Entrepreneurial Creativity & Innovation. 3 Hours.
PR or CONC: ENTR 400 with a minimum grade of C-. This course offers an in-depth study of theories and models of creativity to solve problems and identify opportunities in entrepreneurial business contexts. Students will synthesize their course experiences and develop a set of creative business ideas, which will be incorporated into feasibility assessments, financial analyses, and business plans in subsequent entrepreneurship major courses.

ENTR 416. Social Entrepreneurship. 3 Hours.
PR or CONC: ENTR 400 with a minimum grade of C-. This course will expose students to the topics and concepts in the emerging field of social entrepreneurship. The primary topic - how social entrepreneurs use business models to create sustainable enterprises.

ENTR 420. Entrepreneurial Finance. 3 Hours.
PR: WVU sections require PR or CONC: ENTR 400 with a minimum grade of C-, WVUIT sections require ACCT 201 with a minimum grade of C- and PR or CONC: ENTR 400 with a minimum grade of C-. Fundamental principles and practices in finance related to entrepreneurship. Focuses on areas such as accounting, budgeting, and financial management as they apply to entrepreneurship.

ENTR 425. Risk Assessment and Contracts. 3 Hours.
PR or CONC: ENTR 400 with a minimum grade of C-. This course teaches students to assess risks in entrepreneurial enterprises that lead to business failures. Students will learn to develop business models, implement operational strategies, and structure legal agreements that mitigate exposure to risk in new ventures and emerging growth entities.

ENTR 436. Family Business. 3 Hours.
PR or CONC: ENTR 400 with a minimum grade of C-. This class focuses on the different aspects of family businesses that facilitate competitive advantage while maintaining ethical and socially responsible principles. The objectives of this course are to create an awareness of family business issues, understand the role of familial relationships in a business context, and develop critical thinking skills in the context of family business challenges.

ENTR 440. Small Business Consulting. 3 Hours.
PR or CONC: ENTR 400 with a minimum grade of C-. This course is a practicum designed to develop students' critical thinking and applied problem-solving skills. Student consulting teams work with small business clients to identify, analyze, and develop solutions for important issues faced by their clients.

ENTR 460. Entrepreneurship Practicum. 3 Hours.
PR: ENTR 400 with a minimum grade of C-. This course builds on the learning outcomes from ENTR 400 and helps students gain experiential, concrete knowledge of how to start and manage a new business—by starting real businesses in the classroom.

ENTR 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ENTR 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

ENTR 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENTR 495. Independent Study. 1-6 Hours.

ENVE 347. Introduction to Environmental Engineering. 3 Hours.
PR: (CHEM 115 and MATH 156) with a minimum grade of C- and PR or CONC: ENVE 347L. Introduction to key concepts relevant to environmental engineering. Students will apply mass balance principles and reaction kinetics in engineering calculations and design of treatment systems. Additional topics to be covered in this class include water pollution, drinking water and wastewater treatment, air pollution, solid waste management, risk assessment, and environmental regulations.

ENVE 347L. Introduction to Environmental Engineering Laboratory. 1 Hour.
PR: (CHEM 115 and MATH 156) with a minimum grade of C- and PR or CONC: ENVE 347. Introduction to environmental analysis of aqueous systems. The analyses covered are all commonly used for monitoring ambient surface and groundwater conditions, effluent discharges, and the performance of treatment processes.

ENVE 348. Environmental Engineering Processes. 3 Hours.
PR: ENVE 347 and ENVE 347L. Fundamentals of transport phenomena governing the fate of chemical and biological contaminants in environmental systems; introduction to environmental organic chemistry; principles of applied environmental microbiology governing chemical transformations relevant for treatment of waste streams.

ENVE 352. Geoenvironmental Engineering. 3 Hours.
PR: CE 201 and (CE 210 or MINE 261) and MAE 241 and MATH 261 and STAT 215 with a minimum grade of C- in all and PR or CONC: ENVE 352L. This course will introduce the subject of soil mechanics and provide the basic theory and practice of geotechnical and geoenvironmental engineering to all environmental and civil engineering students.

ENVE 352L. Introductory Geoenvironmental Laboratory. 1 Hour.
PR: CE 201 and (CE 210 or MINE 261) and MAE 241 and MATH 261 and STAT 215 with a minimum grade of C- in all and PR or CONC: ENVE 352. The objective of this course is to provide the basic theory and practice of geotechnical and geonvironmental laboratory soil testing to all environmental and civil engineering students. This course is the hands-on laboratory experience.

ENVE 441. Water Treatment Principles and Design. 3 Hours.
PR: ENVE 348. This course covers engineering principles and design of water supply and treatment methods, including source water protection, coagulation, flocculation, sedimentation, multimedia filtration, softening, ion exchange, membrane filtration, disinfection, and emerging technologies.

ENVE 442. Wastewater Treatment. 3 Hours.
PR: CE 347 or ENVE 347. Introduce the students to the various methods and processes used in the treatment of wastewater before disposing into natural water bodies.

ENVE 443. Decentralized Wastewater Treatment. 3 Hours.
PR: ENVE 348. Principles of decentralized treatment and onsite management of wastewater steams, including site evaluation, alternative collection systems, onsite treatment technologies, land treatment systems, and effluent reuse and disposal.

ENVE 446. Air Pollution and Climate Change. 3 Hours.
PR: ENVE 348. This course covers air pollution issues; regulations; air pollutant characteristics; sources, transport and fate of air pollutants; models for predicting dispersion and air pollutant concentrations; and effects on the environment and human society. Topics also cover climate change science, impacts and case studies.

ENVE 447. Air Pollution Control. 3 Hours.
PR: ENVE 348. Applications of engineering design for air quality control, including control of particulate and gas emissions from stationary sources and mobile sources. Design for indoor air quality and regional air quality control.

ENVE 448. Public Health Engineering. 3 Hours.
PR: ENVE 348. Introduction to environmental human health hazards; fundamental concepts of environmental toxicology, epidemiology, infectious disease microbiology, and risk assessment; engineering applications for control of environmental health hazards.

ENVE 449. Sustainable Development Engineering. 3 Hours.
PR: ENVE 348. Study of applying interdisciplinary and sustainable engineering, public health, anthropology, science policy, and technology to provide equitable access to food, energy, water, and health in low- and middle-income countries and underserved communities in high-income countries like the United States. Concepts of sustainable development are covered, particularly the United Nations Sustainable Development Goals.

ENVE 479. Environmental Systems Design. 3 Hours.
PR: ENVE 347 and 347L and ENVE 348 and ENVE 352 and 352L and ENVE 449 and CE 425 and one ENVE Design Elective. Capstone integration of environmental engineering curriculum by comprehensive design experience to professional standards. Projects are performed in student groups under faculty supervision.

ENVE 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENVP 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

ENVP 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ENVP 401. Environmental Microbiology. 3 Hours.
PR: AEM 341 or consent and PR or CONC: ENVP 401L. Microbiology as applied to soil, water, wastewater, sewage, air, and the general environment. Occurrence, distribution, ecology, and detection of microorganisms in these environments. (Also listed as AEM 401.).

ENVP 401L. Environmental Microbiology Laboratory. 1 Hour.
PR or CONC: ENVP 401. Environmental Microbiology - ENVP 401 Laboratory.

ENVP 412. Pest Management. 3 Hours.
PR: ENTO 404 or consent. An in-depth look at current problems and solution in controlling insect pests in an environmentally compatible manner. Management techniques include cultural, mechanical, physical, biological, regulatory, and chemical practices. (Also listed as ENTO 412.).

ENVP 415. Hazardous Waste Training. 3 Hours.
PR: Corequisite of ENVP 415L. Introduction to hazardous waste training. Lectures and hands-on experience with health and safety plan development, selecting personal protective equipment, air monitoring, incident command, site characterization, decontamination and toxicology. Includes two full-scale disaster exercises.

ENVP 415L. Hazardous Waste Training Laboratory. 0 Hours.
Coreq: ENVP 415. Hazardous Waste Training - ENVP 415 Laboratory.

ENVP 420. Soil Microbiology. 3 Hours.
PR: AEM 341. Microbiology and biochemistry of the soil environment. Occurrence, distribution, ecology, and detection of microorganisms in soil. (Also listed as AEM 420 and AGRN 420.).

ENVP 451. Principles of Weed Science. 2 Hours.
PR: AGRN 202 and AGRN 203 and PLSC 206 or consent and PR or CONC: ENVP 451L. Fundamental principles of weed science including identification, ecology and control in crops. (Also listed as AGRN 451.).

ENVP 451L. Principles of Weed Science Laboratory. 1 Hour.
PR or CONC: ENVP 451. Principles of Weed Science - ENVP 451 Laboratory.

ESL 140. English as a Second Language Academic Reading/Writing. 3 Hours.
For undergraduate (and graduate) international students. Develops the skills necessary to improve academic reading skills to write well-organized and self-edited essays in a variety of rhetorical modes.

ESL 160. Diversity Issues in America. 3 Hours.
PR: Students must be enrolled in the AMP ESL program. Practice in academic vocabulary, speaking, listening, reading, and writing skills with an emphasis on lectures, note-taking, and self-reflection. Incorporates diversity, inclusion, and social justice aspects of the language learning process.

ESL 170. Academic Language Skills and Cultural Studies. 3 Hours.
PR: Restricted to students registered in the AMPS program. For undergraduate international students. Provides practice in academic speaking and listening skills with an emphasis on presentations, lectures, note-taking, and pronunciation. Incorporates cultural aspects of the language in the learning process.

ESL 180. West Virginia Culture for ESL. 3 Hours.
PR: Restricted to students registered in the AMPS program. Exploration of the history and cultures that became West Virginia through examination and discussion of literature about the region, folktales, state archives, music history of the region, and contemporary information sources.

ESL 240. English as a Second Language Research and Writing. 3 Hours.
Provides undergraduate and graduate international students with the skills, strategies, and procedures necessary for researching a topic and writing a well-organized and logical research paper.

ESL 250. Speaking and Listening. 3 Hours.
For undergraduate and graduate international students. Provides guidance and practice in general and academic speaking and listening skills and improves oral comprehensibility through pronunciation activities.

ESL 260. English for STEM. 3 Hours.
PR: Restricted to students registered in the AMPS program. Students will build the language skills they need to be successful STEM students in a university context. No prerequisites required.

ESL 270. English for Environmental Science. 3 Hours.
PR: Restricted to students registered in the AMPS program. This introduction to environmental science course for ESL students aims to introduce the topic of environmental issues with focus on sustainability and the effects that human activity has on the environment. The course will familiarize students with the ideas behind and the debates within sustainability studies.

ESL 280. Academic Writing. 3 Hours.
PR: Restricted to students registered in the AMPS program. The goal of this course is to prepare you to succeed in your academic classes at WVU by improving your academic writing skills. In this context, you will be expected to analyze, synthesize, and report on a variety of topics in multiple genres, both in out-of-class writing assignments, as well as for in-class timed essays or short answer questions.

ESL 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ESL 350. International Teaching Assistants Fluency. 3 Hours.
Designed for graduate students wishing to become International Teaching Assistants (ITAs). Course focuses on the characteristics of effective oral communication in English in order to improve SPEAK test scores and comprehensibility in the classroom.

ESL 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ESL 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ESL 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ESL 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ESL 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.

ESL 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ESL 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ESLP 000. Intensive English Program. 15 Hours.
Study in the Intensive English Program, with a focus on improving English language skills. Course does not count toward any degree program.

ESWS 119. Soil in the City. 3 Hours.
PR: Corequisite of ESWS 119L. Study of soil as a natural resource in urban environments; influence of soils on urban development; study of environmental problems related to soils in urban land uses.

ESWS 119L. Soil in the City Laboratory. 0 Hours.
PR: Corequisite of ESWS 119. Soil in the City - ESWS 119 Laboratory.

ESWS 125L. Soil Judging Laboratory. 1 Hour.
PR: Consent. Field study of soils for classification and land use evaluation. (May be repeated for maximum of 3 credits.).

ESWS 155. Elements of Environmental Protection. 3 Hours.
An introduction to land and water resources and their management and protection. An evaluation of the relationships between human activities and natural environments and the interaction between natural resource utilization and development.

ESWS 202. Principles of Soil Science. 3 Hours.
PR: (CHEM 111 or CHEM 115) and PR or CONC: (AGRN 202L or AGRN 203 or ESWS 202L). Introductory course. Soils as a natural resource emphasizing physical, chemical, and biological properties in relation to plant growth and production, land use and management, soil and water pollution, and environmental protection. (Regional campus concurrent).

ESWS 202L. Principles of Soil Science Laboratory. 1 Hour.
PR or CONC: ESWS 202 or consent. (Regional campus concurrent.).

ESWS 224. Freshwater Field Methods. 4 Hours.
PR or CONC: (BIOL 101 or BIOL 115 or ESWS 155 or GEOL 101) and Coreq: ESWS 224L. In this course, students will study the fundamentals of freshwater systems including streams and rivers, lakes, and wetlands. Physical, chemical, biological, and ecological concepts will be addressed with a special focus on flowing systems. A variety of field methods for surveying freshwater systems will also be practiced.

ESWS 224L. Freshwater Field Methods Laboratory. 0 Hours.
PR or CONC: (BIOL 101 or BIOL 115 or ESWS 155 or GEOL 101) and Coreq: ESWS 224. In this course, students will study the fundamentals of freshwater systems including streams and rivers, lakes, and wetlands. Physical, chemical, biological, and ecological concepts will be addressed with a special focus on flowing systems. A variety of field methods for surveying freshwater systems will also be practiced.

ESWS 225L. Advanced Soil Judging Laboratory. 1 Hour.
Advanced field study for soil classification and land use evaluation. Participation in National Collegiate Soils contest required. (May be repeated for maximum of 3 credits.).

ESWS 255. Elements of Environmental Management. 3 Hours.
PR: ESWS 155. An introduction to the various regulations promulgated by the United States Environmental Protection Agency. The main goal of this course is to provide the student with a foundation of knowledge that will allow them to read and interpret environmental regulations as well as all types of regulations and codes.

ESWS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ESWS 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

ESWS 325. Principles of Water Resources. 3 Hours.
PR: MATH 124 or higher. This course provides students an opportunity to increase their knowledge pertaining to the role(s) that water plays in human and environmental systems by examining the geographic distribution/redistribution, quantity, and quality of water resources. Students are introduced to water management evaluation policies, law and economics used to explore the decision-making challenges surrounding water resources.

ESWS 330. Soil Health. 3 Hours.
PR: (AGRN 202 or ESWS 202) and (AGRN 203 or AGRN 202L or ESWS 202L). This course will also explore the potential of, and the limitations to, the Soil Health paradigm as applied at a global scale.

ESWS 347. Wetland Environments. 3 Hours.
PR: (AGRN 202 or ESWS 202) and (AGRN 202L or AGRN 203 or ESWS 202L). Wetlands as components of natural landscapes: hydrology, geomorphology, biogeochemistry; identification and classification of wetland vegetation, soils, hydrology, and wildlife; factors important to wetland delineation and jurisdictional determination; wetland conservation, restoration, and creation.

ESWS 355. Environmental Sampling and Analysis. 3 Hours.
PR: BIOL 101 and BIOL 102 and BIOL 103 and BIOL 104 and CHEM 115 and CHEM 116. Introduction to environmental sampling methods and analysis. Lecture and hands-on experience will include sampling plan development, sample point selection, sampling equipment use, containers and preservatives, sample analysis, chain-of-custody and protective equipment.

ESWS 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ESWS 410. Soil Fertility. 3 Hours.
PR: ((ESWS 202 and ESWS 202L) or (AGRN 202 and AGRN 202L)) and (CHEM 111 or CHEM 115). Effect of soil chemical and physical properties on soil fertility; evaluation of essential and toxic nutrients and the controls on their availability; fertilizer and lime use; soil fertility evaluation.

ESWS 415. Soil Survey and Land Use. 3 Hours.
PR: (ESWS 202 and ESWS 202L) and Coreq: ESWS 415L. Identification of morphological characteristics and taxonomic units of soil; techniques of writing soil pedon and mapping unit descriptions; techniques of preparing soil maps; evaluation of soil for land use planning.

ESWS 415L. Soil Survey and Land Use Laboratory. 0 Hours.
PR: Corequisite of ESWS 415. Soil Survey and Land Use - ESWS 415 Laboratory.

ESWS 417. Soil Genesis and Classification. 4 Hours.
PR: ESWS 202 and ESWS 202L and Coreq: ESWS 417L. Origin and formation of soils; principles of soil classification; study of soil pedons and polypedons; influence of soil-forming factors and processes. (Two Saturday field trips required.).

ESWS 417L. Soil Genesis and Classification Laboratory. 0 Hours.
PR: Corequisite of ESWS 417. Soil Genesis and Classification - ESWS 417 Laboratory.

ESWS 425. Environmental Soil Management. 3 Hours.
PR: AGRN 202 and (AGRN 202L or AGRN 203) and Coreq: ESWS 425L. This course provides a foundation for utilizing creative solutions and technical knowledge in preserving and enhancing soil and water quality. Soil conservation, precision agriculture and nutrient management for protection of soil and water quality are covered. (Also listed as ENVP 425.).

ESWS 425L. Environmental Soil Management Laboratory. 0 Hours.
PR: Corequisite of ESWS 425. Environmental Soil Management - ESWS 425 Laboratory.

ESWS 430. . 3 Hours.
PR: (ESWS 202 and ESWS 202L) or (AGRN 202 and (AGRN 202L and AGRN 203) and Coreq: ESWS 430L. Physical properties of soils; water and air relationships and their influence on soil productivity.

ESWS 430L. Soil Physics Laboratory. 0 Hours.
PR: (ESWS 202 and ESWS 202L) or (AGRN 202 and 203) and Coreq: ESWS 430. Soil Physics - ESWS 430 Laboratory.

ESWS 455. Reclamation of Disturbed Soils. 3 Hours.
PR: Junior standing or above. Principles of soil science, geology, hydrology, and engineering will be applied to surface mine planning, overburden handling during mining, soil replacement and amendments, revegetation practices, acid mine drainage control and treatment, hazardous wastes, and land management of disturbed areas. (Field trip required.) (Also listed as ENVP 455.).

ESWS 460. Environmental Impact Assessment. 3 Hours.
PR: (BIOL 101 and BIOL 101L and BIOL 102 and BIOL 102L) or (BIOL 115 and BIOL 115L) and (CHEM 115 and CHEM 116) and Coreq: ESWS 460L. Application of physical, biological and social science principles to assess environmental impacts. Review and prepare environmental assessments, permits, site assessments and ecological risk assessments for environmental decision-making.

ESWS 460L. Environmental Impact Assessment Laboratory. 0 Hours.
PR: Corequisite of ESWS 460. Environmental Impact Assessment - ESWS 460 Laboratory.

ESWS 475. Environmental Water Resources. 3 Hours.
This course provides background in the physical fundamentals of water resources and interactions of land use practices, environmental water use, and water resources extraction(s) that will equip students with requisite knowledge to address complex contemporary water resources issues.

ESWS 490. . 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ESWS 491. . 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ESWS 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.

ETEC 130. Manufacturing Processes 1. 2 Hours.
PR or CONC: (MATH 124 or MATH 126 or higher) and PR or CONC: ETEC 130L. Introduction to manufacturing processes including machining, turning, welding, fabrication, casting.

ETEC 130L. Manufacturing Processes 1 Laboratory. 1 Hour.
PR or CONC: ETEC 130. Practical experience with common manufacturing processes and equipment.

ETEC 199. Introduction to Engineering Technology. 1 Hour.
An introduction to the profession and environment of engineering technology, including industrial careers and work environment, employer expectations, industry standards, communication, social impact, and ethics.

ETEC 210. Engineering Graphics and Descriptive Geometry. 2 Hours.
PR: (MATH 124 or higher) with a minimum grade of C- and PR or CONC: ETEC 210L. Introduction to technical drawing, including orthographic projections and isometric drawing, with emphasis on Computer Aided Design (CAD) constraint-based solid modeling, sketching, and assemblies.

ETEC 210L. Engineering Graphics and Descriptive Geometry Laboratory. 1 Hour.
PR or CONC: ETEC 210. Practical experience using CAD tools to design 2D and 3D models.

ETEC 220. Applications of Technology. 2 Hours.
PR: ETEC 130 and ETEC 210 and PR or CONC: ETEC 220L. Integration of computer technology into manufacturing processes and design.

ETEC 220L. Applications of Technology Laboratory. 1 Hour.
PR: ETEC 130L and ETEC 210L and PR or CONC: ETEC 220. Laboratory experience with 3D modeling software and integrating software with manufacturing processes.

ETEC 310. Material Science with Applications. 2 Hours.
PR: (CHEM 111 and CHEM 111L) or (CHEM 115 and CHEM 115L) and (MATH 150 or MATH 153 or MATH 155) and PR or CONC: ETEC 310L. An overview of material properties, including mechanical properties, temperature effects, and heat treatment, for common engineering materials, such as metals, ceramics, polymers, and composites.

ETEC 310L. Material Science with Applications Laboratory. 1 Hour.
PR or CONC: ETEC 310. Laboratory experience investigating material properties and behavior related to common engineering materials.

ETEC 320. Thermodynamics for Engineering Technology. 3 Hours.
PR: (MATH 151 or MATH 156) and (PHYS 101 or PHYS 111). An introduction to the principles of thermodynamics and heat transfer. Properties of ideal gases and vapors, first and second laws of thermodynamics, and basic gas and vapor cycles.

ETEC 330. Manufacturing Processes 2. 2 Hours.
PR: ETEC 220 and ETEC 310 and PR or CONC: ETEC 330L. Introduction to design for manufacturability methods and computer-aided manufacturing (CAM), including CNC programming. Problem solving skills are developed in the areas of process planning, material selection, and optimization.

ETEC 330L. Manufacturing Processes 2 Laboratory. 1 Hour.
PR or CONC: ETEC 330. Practical experience related to the use of common automated manufacturing equipment using CNC programming.

ETEC 340. Electronic Circuits. 3 Hours.
PR: (MATH 151 or MATH 156 with a minimum grade of C-) and (PHYS 102 or PHYS 112 with a minimum grade of C-) and PR or CONC: ETEC 340L. Introduction to electrical components, direct current (DC) analysis, circuit theorems and basic electrical measurements.

ETEC 340L. Electronic Circuits Laboratory. 1 Hour.
PR or CONC: ETEC 340. Laboratory experience related to circuits and basic electrical measurements.

ETEC 350. Analysis for Engineering Technology. 3 Hours.
PR: ENGR 102 and (MATH 151 or MATH 156 with a minimum grade of C-). Application of analytical, numerical, and computational techniques to analyze and solve engineering and technology problems.

ETEC 370. Applied Workshop. 1 Hour.
PR or CONC: ETEC 130. The course provides the formal structure for active engagement on student competition teams related to engineering and engineering technology. Application of skills to solving large challenges; teamwork; professionalism and engineering ethics; technical problem solving.

ETEC 401. Science, Technology, & Society. 2 Hours.
PR: Senior standing. Addresses professional ethics, legal issues, professional development, technology transfer, and corporate culture and expectations as they relate to Engineering Technology graduates and our global society.

ETEC 440. Industrial Automation PLC 1. 2 Hours.
PR: (EE 221 or ETEC 340) and PR or CONC: 440L. Introduction to the concepts, devices, and common practices associated with modern industrial control systems. Programmable Logic Controller (PLC) applications focus on interfacing and controlling a variety of electromechanical devices such as motors and pneumatic actuators. Industrial safety practices and procedures are emphasized throughout the course.

ETEC 440L. Industrial Automation PLC 1 Laboratory. 1 Hour.
PR or CONC: ETEC 440. Laboratory experience related to PLC applications.

ETEC 450. Technology Certification. 1 Hour.
PR or CONC: ETEC 130. The course provides the structure for preparation for industry certification beyond those offered within the regular curriculum.

ETEC 475S. Engineering Technology Capstone Experience. 3 Hours.
PR: ETEC 330 and ETEC 340. Capstone integration of the engineering technology curriculum by the design and implementation of a solution to a broadly defined engineering problem. Projects are performed in student groups under faculty supervision.

ETEC 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ETEC 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.

EXCG 201. Student Exchange Program. 0 Hours.

EXCG 202. Study Abroad Program. 0 Hours.

EXCG 492. Directed Study. 1-3 Hours.
Directed Study, reading, and/or research.

EXPH 100. Orientation: Exercise Physiology 1. 1 Hour.
Orientation to degree requirements, departmental resources, curriculum options, and student responsibilities in Exercise Physiology. Promoting academic success strategies and exposing students to future career opportunities in Exercise Physiology.

EXPH 101. Introduction to Exercise Physiology. 2 Hours.
A broad and foundational look at the function and adaptation of the systems of the human body in response to exercise.

EXPH 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

EXPH 230. Exercise in American Culture. 3 Hours.
Covers issues of exercise in America, specifically themes integral to American culture such as age, class, race, gender, and beauty.

EXPH 235. Introduction to Global Issues in Exercise Physiology. 3 Hours.
History, concepts, theories, and ethics of development, colonialism, and charity as they impact health and wellness locally, in the United States, and across the world. Topics such as poverty, food insecurity, women's rights, disease outbreaks, and NGOs are discussed to provide a broader perspective on how the past has impacted our present.

EXPH 240. Medical Terminology. 2 Hours.
The study of medical language with special emphasis given to terms used in the field of exercise physiology.

EXPH 287. Introduction to Biomedical Research for Exercise Physiologists. 1 Hour.
This seminar-based course is a comprehensive exploration of the diverse and dynamic field of biomedical sciences research in exercise physiology with the goal of inspiring interest and facilitating informed decision-making regarding careers in biomedical sciences research. Through a combination of theoretical lectures, practical exercises, interactive discussions, and lab tours, students will gain valuable insights into opportunities in this field.

EXPH 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

EXPH 304. Introduction to Health Disparities. 1 Hour.
Introduction to Health Disparities focuses on the causes and outcomes of health inequities. Examine the roots of systemic inequality, starting with the social determinants of health including age, race, gender, and environment; and learn about the history, ethics, and contemporary problems related to health disparities.

EXPH 305. Rural Health Outreach and Engagement. 2 Hours.
Rural Health Outreach and Engagement gives students hands-on learning experiences outside of the classroom. Students are placed with a rural organization to learn about community-driven service, social inequities, and community development. Develop an understanding of current rural health topics through a series of lectures and in-class reflective practice.

EXPH 306. Appalachian Engagement in Action. 3 Hours.
PR: EXPH 304 and EXPH 305 with a minimum grade of C- in both. In Appalachian Engagement in Action, students will develop a project to actively serve the needs of the community. Students will be able to tailor this course to meet their own interests.

EXPH 363. Honors Add-On to Kinesiology. 1 Hour.
PR or CONC: EXPH 364 with a minimum grade of C- and students must be an enrolled in the Honors College. This course is a supplemental course for Honors students enrolled in EXPH 364. Each week, we will participate in an enrichment experience with practical application of principles taught in Kinesiology.

EXPH 364. Kinesiology. 3 Hours.
PR: MATH 124 or higher or (ACT math score of 26 or SAT math score of 580 and (QRA Part 1 score of 15 and QRA Part 2 score of 9)) and sophomore standing or consent. Anatomical, mechanical, and musculoskeletal study of the human body as the instrument for efficient performance of motor activities.

EXPH 365. Exercise Physiology 1. 3 Hours.
PR: Junior standing or consent. The study of the functioning of body systems during exercise and the acute and chronic adaptations that occur from exercise stress.

EXPH 367. Exercise Nutrition. 3 Hours.
PR: Exercise Physiology majors only and Sophomore standing or higher. This course prepares future exercise physiologists and pre-health professionals to provide evidence-based nutritional recommendations within their scope of practice by covering human nutrition as it relates to health and wellness, general physical activity, and exercise performance.

EXPH 368. Lab Techniques and Methods. 3 Hours.
PR: Junior standing and EXPH 364 and EXPH 365 or consent. Techniques and methods for designing and conducting exercise programs for asymptomatic, healthy individuals.

EXPH 369. Strength/Conditioning Methods. 4 Hours.
PR: EXPH 364 and EXPH 386 with a minimum grade of C- in each. Scientific foundations of strength and conditioning with skills and methods to apply that knowledge in clinical exercise training.

EXPH 370. Writing for Exercise Science. 3 Hours.
PR: ((ENGL 101 or ENGL 1C1) and (ENGL 102 or ENGL 1C2)) or (ENGL 103) with a minimum grade of C- and PR or CONC: EXPH 386. Writing for medical scientific fields. Students will develop a book review, analyze discipline-specific texts, and write scientific literature reviews. Includes a review of style and language use.

EXPH 386. Advanced Physiology of Exercise 1. 3 Hours.
PR: BIOL 101 and BIOL 101L and BIOL 102 and BIOL 102L (or BIOL 115 and BIOL 115L and BIOL 117 and BIOL 117L) and CHEM 115 and CHEM 115L and PHYS 101 with a minimum grade of C- in all and PR or CONC: EXPH 388. The study of the major systems of the body and how they function during acute and chronic adaptations that occur from exercise stress. Special focus is given to metabolism and the neuromuscular, respiratory, and cardiovascular systems.

EXPH 387. Advanced Physiology of Exercise 2. 3 Hours.
PR: EXPH 386 and EXPH 388 with a minimum grade of C- in each and PR or CONC: EXPH 389. A study of the functioning of body systems during exercise and the acute and chronic adaptations that occur from exercise stress. Special focus is given to the endocrine system, obesity and body composition, exercise throughout the lifespan, environmental exercise stress, and clinical exercise physiology.

EXPH 388. Physiology of Exercise Laboratory 1. 1 Hour.
PR or CONC: EXPH 386 with a minimum grade of C-. A study of the laboratory techniques and methods used in clinical and athletic settings by exercise professionals specifically as they relate to those topics covered in EXPH 386.

EXPH 389. Advanced Physiology of Exercise Lab 2. 1 Hour.
PR: EXPH 386 and EXPH 388 with a minimum grade of C- in each and PR or CONC: EXPH 387. A study of the laboratory techniques and methods used in clinical and athletic settings by exercise professionals specifically as they relate to those topics covered in EXPH 387.

EXPH 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

EXPH 405. Appalachian Health Outcomes: History & Practice. 3 Hours.
PR: EXPH 304 with a minimum grade of C-. An advanced study of rural Appalachian Health Disparities. Develop a deeper understanding of the connection between social class, access to resources, and health outcomes in the Appalachian region with a focus on noncommunicable diseases.

EXPH 425. Motor Learning & Control. 3 Hours.
PR: EXPH 364 with a minimum grade of C- and PR or CONC: EXPH 440. This course introduces students to the study of motor control and motor learning for the purposes of practical application in daily living, exercise, rehabilitation, and sport.

EXPH 440. Anatomy for Exercise Physiology. 3 Hours.
PR: (BIOL 101 and BIOL 102 and (BIOL 101L or BIOL 103) and (BIOL 102L or BIOL 104)) or BIOL 115 with a minimum grade of C-. Provides students an in-depth integrative understanding of human anatomy. A regional approach will be used to learn typical and atypical anatomical structures of the human body. Clinical correlations will made throughout each topical area.

EXPH 441. Gross Anatomy Laboratory for Exercise Physiology. 2 Hours.
PR: (BIOL 101 and BIOL 101L and BIOL 102 and BIOL 102L) or BIOL 115) with a minimum grade of C- and PR or CONC: EXPH 440 and Junior level status. Provides an in-depth integrative understanding of human anatomy. Lab dissection activities associated with co-requisite lectures will be used to learn typical and atypical anatomical structures of the human body.

EXPH 450. Theory of Aquatic Therapy. 4 Hours.
PR: Junior standing or consent. An introduction to aquatic therapy. It covers the historical perspective, biophysiologic response to water immersion, and application of aquatic therapy to specific physical diagnoses.

EXPH 451. Application of Aquatic Therapy. 3 Hours.
PR: Junior standing and EXPH 450 and consent. Design and implementation of aquatic exercise prescriptions to meet rehabilitation goals. Aquatic therapy techniques will be demonstrated and practiced.

EXPH 452. Aquatic Therapy Facility Management. 3 Hours.
PR or CONC: EXPH 450 with a minimum grade of C-. Facility design, water chemistry, water safety, and aquatic programming for special populations including rehabilitation, community re-entry, and wellness programs in a comprehensive continuum of care.

EXPH 460. Pathophysiology. 3 Hours.
PR: EXPH 386 and EXPH 387 and PR or CONC: PSIO 241 or PSIO 441 and junior standing or permission. The study of disease etiology and the physiological changes that occur from disease, with special emphasis given to the use of exercise in disease prevention and therapy.

EXPH 461. Exercise is Medicine. 3 Hours.
PR: EXPH 386 and EXPH 388 with a minimum grade of C- in each. The primary objective of this course is to examine how exercise is used as a safe and effective treatment for various disease conditions. Additionally, this course will discuss principles of the Exercise is Medicine model set forth by the American Medical Association and American College of Sports Medicine when assessing and prescribing physical activity in individuals.

EXPH 470. Research Methods. 3 Hours.
PR: Senior standing. CoReq: EXPH 496. The study of the scientific method and research design as it relates to the field of exercise physiology and preventive medicine.

EXPH 475. Industry Organization in Exercise Physiology. 3 Hours.
Prepares exercise physiology students to work in health care fitness related fields and promotes knowledge on how to build a business plan for entrepreneurship.

EXPH 477. Professional Development for Exercise Physiologists. 1 Hour.
PR: Senior standing students in Exercise Physiology. This course ensures seniors in exercise physiology have met core competencies required to become a practicing exercise physiologist and have documented experiences demonstrating their competitiveness for their chosen field.

EXPH 480. Introduction to Performing Arts Medicine. 3 Hours.
PR: EXPH 364 with a minimum grade of C- or consent. This course introduces students to foundational concepts of performing arts medicine and science. Students are encouraged to enroll in this course if they are interested in performing artists as a patient or client population. This is the introductory course for the area of emphasis in dance science and is also part of the minor in performing arts medicine curriculum.

EXPH 481. Performance Enhancement for Performing Artists. 3 Hours.
PR: EXPH 480 with a minimum grade of C-. This course provides students with a foundation in performance enhancement for performing artists. Students will explore strategies to improve strength, flexibility, endurance, and overall physical conditioning, while also delving into mental techniques such as visualization, goal setting, stress management, and focus enhancement. The course emphasizes the integration of these methods to support optimal performance, injury prevention, and long-term well-being.

EXPH 482. Injuries and Illnesses of Performing Artists. 4 Hours.
PR: EXPH 480 with a minimum grade of C- in each. This course focuses on managing injuries and illnesses in performing artists, preparing students for careers as exercise physiologists or allied health professionals. Students learn how to assess injuries, choose interventions, and apply basic rehabilitation techniques. The course also covers ethical, cultural, and professional standards in clinical practice with a diverse population of performing artists.

EXPH 483. Seminar in Applied Anatomy for Dance Movements. 1 Hour.
PR: EXPH 440 with a minimum grade of C-. Presentation and discussion of topics of mutual concern to students and faculty. Current topics in the literature include those that are associated with anatomical limitations and movement demands of multiple dance forms.

EXPH 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

EXPH 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experimental learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

EXPH 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

EXPH 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

EXPH 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

EXPH 496. Senior Thesis. 1-3 Hours.
PR: Consent.

EXPH 497. Research. 1-6 Hours.
Independent research projects.

EXPH 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

EXPH 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

FCLT 160. Spanish Civilization. 3 Hours.
This course provides students with an understanding of and an appreciation for Spanish culture throughout history.

FCLT 210. Chinese Civilization and Culture. 3 Hours.
This is a survey course taught in English that introduces Chinese institutions, language philosophy, religion, art, literature, family and marriage, and Chinese social etiquette.

FCLT 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FCLT 298. Honors. 1-3 Hours.
PR: Student in Honors Program and consent by the honors director. Independent reading, study or research.

FCLT 310. Chinese Cinema. 3 Hours.
A study of representative Chinese films from the early twentieth century to the present; films subtitled, readings and discussion in English.

FCLT 311. The Chinese Experience. 3 Hours.
Faculty-led study abroad course covering Chinese culture, traditions, costumes, and the development of modern Chinese society through lectures, workshops, visits to historical landmarks, and interaction with the local Chinese people.

FCLT 340. Italian Cinema 1945 to Present. 3 Hours.
Introduces students to key topics of modern Italian culture and history as explored through cinema. It will focus on a selection of Italian films from World War II to the present.

FCLT 342. The Italian Mafia: History and Legend. 3 Hours.
Investigation of the history of the mafia, the harsh reality of life in the mafia, and the ways in which it reaches into every aspect of Italian politics. Exploration and discussions of the myths pervasive in popular culture.

FCLT 360. Latin American Cinema. 3 Hours.
Examination of film from Latin America in socio-cultural context.

FCLT 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FCLT 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

FCLT 491. Professional Field Experience. 1-18 Hours.
PR: Consent (may be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

FCLT 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FCLT 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

FCLT 495. Independent Study. 1-6 Hours.
PR: Consent. Faculty supervised study of topics not available through regular course offerings.

FCLT 498. Honors. 1-3 Hours.
PR: Student in Honors Program and consent by the honors director. Independent reading, study or research.

FDM 110. Introduction to Fashion Business. 3 Hours.
This course introduces the fashion business by exploring its production and distribution systems with a focus on basic merchandising, design, marketing, and retail concepts.

FDM 111S. Pittsburgh Study Tour. 1 Hour.
PR: FDM major or department approval. This short course offers a fashion networking tour of Pittsburgh to undergraduate Fashion Design and Merchandising students to build their fashion knowledge and develop skills for their future careers. Students will be introduced to concepts of business etiquette, network with local creatives, and tour a Pittsburgh-based apparel company.

FDM 130. Design Concepts of Dress. 3 Hours.
Introduction to design theory and methodology, elements of design, principles of composition, and universal design related to dress. Practical application included.

FDM 131. Fashion Design. 3 Hours.
Market trend research and fabric/trim sourcing are used to design a women's wear collection. Studio work helps develop fashion illustration skills, create a collection, and drape one original design.

FDM 132S. Apparel Construction Studio. 3 Hours.
PR: FDM majors only or consent. Basic principles of garment construction. Use of industry methods to analyze, develop, and assemble garments.

FDM 135S. Fashion Illustration and Tech Design 1 Studio. 3 Hours.
PR or CONC: FDM 132S with a minimum grade of C- and FDM majors only or department approval. Methods of communicating apparel production and fashion themes through fashion illustration, technical drawing, and fabric rendering using traditional and digital methods.

FDM 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

FDM 202S. Fashion Impact Challenge. 1 Hour.
PR: FDM major or department approval. This immersive weekend experience will teach students how to form well rounded interdisciplinary teams, conduct research, identify solutions, and move towards implementation. Students will learn how to create profitable, durable, and scalable business solutions that address some of the fashion industry's most pressing issues.

FDM 211. Introduction to Textiles. 3 Hours.
PR or CONC: FDM 110 with a minimum grade of C-, sophomore standing or department approval. The course focuses on textiles intended for use in apparel and soft goods applications. Students examine all stages of the textile supply chain - from fiber to finishes - with opportunity for hands-on exploration. Sustainability and technological innovation in the textile industry are also addressed.

FDM 218. Introduction to Italian Art and Design. 3 Hours.
Exploration of contemporary Italian art and design practice through studio instruction and/or experiential learning.

FDM 220. Fashion, the Body, and Culture. 3 Hours.
Students examine the intersection of fashion, the body, and culture to appreciate the role of dress in everyday life. Students explore dress practices through the lens of economics, politics, religion, and gender, among other social factors. The course emphasizes critical thinking and cross-cultural exploration through group discussion and personal reflection.

FDM 221. Dress History: 1850-Present. 3 Hours.
This course offers a survey of Western dress history from 1850 to present day with an emphasis on the contextual factors that influenced how dress changed over time. The rise and influence of fashion designers in the 20th and 21st century is discussed. Students gain hands-on experience in historical research methodologies.

FDM 222. Fashion Styling Workshop. 3 Hours.
PR: Sophomore or higher. Overview of fashion items needed to attract media attention for a fashion magazine and its editorials. Students produce a photo shoot for a specific target audience with live models, on location, in a professional studio.

FDM 225. Introduction to Italian Culture. 3 Hours.
PR: Sophomore or higher. Exploration of Italian history, culture, art and design through lecture and experiential learning. Field trips such as: Florence, Rome, Siena, San Gimignano, and Monteriggioni. Conversational Italian language included. Students conduct an individual design research project.

FDM 232. Fashion Design Workshop. 3 Hours.
PR: Sophomore or higher and instructor consent. Students research a typical theme or trend to design a small coordinated collection including notebook/sketchbook, mood board, finished and flat drawings, and an original garment. Theoretical lessons, practical lessons, and field trips.

FDM 233. Fashion Accessories Workshop. 3 Hours.
PR: Sophomores or higher and instructor consent. Students research a topical theme or trend to design a small coordinated collection including notebook/sketchbook, mood board, finished, and flat drawings, and an original garment. Theoretical lessons, and field trips.

FDM 250S. Apparel Design 1 Studio. 3 Hours.
PR: (FDM 132 or FDM 132S) and FDM 211 with a minimum grade of C- in both. Creative expression through the introduction of pattern development is studied using the flat-pattern method. Original apparel is designed and constructed.

FDM 260. Visual Merchandising. 3 Hours.
PR: FDM 110 and FDM 130 with a minimum grade of C-. This course explores a wide range of visual merchandising activities in relation to the elements of design and principles of composition including display, store design, theft prevention, and promotion. A teamwork approach is used to create and analyze visual merchandising scenarios.

FDM 261. Fashion Management Workshop. 3 Hours.
PR: Sophomore or higher and instructor consent. Fashion business fundamentals; fashion industry sourcing, supply chain, and fashion buying cycle; management of supplier portfolio; vendor selection and buying decision criteria; retail fashion brand marketing; internationalization of fashion retailing; international branding and flagship stores.

FDM 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FDM 310. Merchandising Practicum. 3 Hours.
PR: FDM 260 with a minimum grade of C- and consent. This course provides a prearranged, on-site supervised work experience to afford practical insight into the textile, apparel, and merchandising profession.

FDM 311. Fashion Study Tour. 1 Hour.
PR: Departmental approval, Restricted to FDM majors with junior standing or above. This course focuses on the apparel and retail industries through visits to apparel firms and showrooms, retail establishments, and museums including an historic costume collection.

FDM 315S. Applied Fashion Technology. 3 Hours.
PR: (DSGN 130S or FDM 130) with a minimum grade of C- or departmental approval. Students will learn and apply the latest technologies to complete merchandising and product development projects. The skills learned will enhance students' confidence in working with new technologies in a fashion setting.

FDM 330S. Fashion Illustration and Tech Design 2 Studio. 3 Hours.
PR: FDM 130 and PR or CONC: (FDM 132 or FDM 132S). Techniques of drawing fashion figures, media, and apparel design presentation techniques explored. Design vocabulary and sources of inspiration examined in the creation of original apparel design renderings and flats for specific target consumers.

FDM 335S. Apparel Design 2 Studio. 3 Hours.
PR: (FDM 250 or FDM 250S) with a minimum grade of C-. This course builds on the knowledge and skills developed in Apparel Design 1 Studio by exploring advanced flat pattern techniques.

FDM 350S. Apparel Design 3 Studio. 3 Hours.
PR: (FDM 335 or FDM 335S) with a minimum grade of C-. Creative and technical pattern development using the draping method. Original apparel designs patterned and constructed.

FDM 360. Retail Merchandising. 3 Hours.
PR: FDM 110 with a minimum grade of C-. This course focuses on intermediate retail merchandising principles as applied to apparel retail and services. The role of merchandising is analyzed relative to market research, planning of new offerings, line development, and competitive strategies for various retail formats.

FDM 361. Merchandise Planning and Control. 3 Hours.
PR: FDM 360 with a minimum grade of C- and MATH 124 (equivalent or higher). This course covers merchandising activities performed on the retail level including planning sales and assortments, selecting merchandise for resale, controlling inventories, and determining profit. Basic mathematical formulas involved in merchandising are practiced.

FDM 370. Quality Analysis. 3 Hours.
PR: FDM 211 with a minimum grade of C-. This course will introduce the principles of material testing and quality analysis. Students will learn about standardized measurements, evaluation of quality, physical characteristics, and the performance of textile, fashion, and softgood products. Students will evaluate product quality, serviceability, and regulatory compliance standards in this course.

FDM 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FDM 411. Fashion Consumer Behavior. 3 Hours.
PR: FDM 360 with a minimum grade of C-. This course will offer an understanding of the consumer-centric nature of the fashion industry. Students will learn consumer behavior theories and models that are applicable to the purchase and usage of fashion products, including the consumer decision making process.

FDM 412. Fashion Sourcing and Supply Chain Management. 3 Hours.
PR or CONC: FDM 360 with a minimum grade of C-. This course evaluates key issues facing fashion businesses in the global marketplace. It includes an examination of internal and external forces affecting political, economic, social, environmental and ethical production, and distribution of textile and apparel products.

FDM 413S. Textile Studio. 3 Hours.
PR: FDM 211 with a minimum grade of C- or consent. An introduction to a variety of techniques that alter the surface of fabric. Students produce samples of textile surface designs with experimentations in textile dyeing and printing, fabric manipulations and stitchery methods. Studio work is augmented by lectures on pattern and color theory, textile techniques throughout history, and contemporary perspectives illustrated by images, textile examples, and working textile artists.

FDM 421. Dress History: Prehistory-1850. 3 Hours.
PR: Junior standing or consent. This course explores the history of fashion and dress from antiquity through 1850 within the corresponding social, cultural, technological, and economic contexts. Explores both Western and Eastern dress and textile histories and how they have influenced each other over time.

FDM 424. Functional Apparel. 3 Hours.
PR: ENGL 101 and ENGL 102 and FDM 220 and FDM 230. Physical, sociological, and psychological clothing needs of individuals with functional needs. Historical developments and research needs explored. Students conduct a service-learning project.

FDM 430S. Senior Studio. 3 Hours.
PR: (FDM 330 or FDM 330S) and (FDM 350 or FDM 350S) and PR or CONC: FDM 432 with a minimum grade of C- in all. The development of a cohesive fashion collection supported by a strong conceptual framework that demonstrates a high level of design, complex problem solving, understanding of target markets and individual design sensibility.

FDM 432. Fashion Design Portfolio. 1 Hour.
PR: FDM 330 with a minimum grade of C- and PR or CONC: FDM 430. Techniques of portfolio presentation from introductory page through development of lines that focus on personal vision & target market.

FDM 435S. Product Development Studio. 3 Hours.
PR: FDM 360 with a minimum grade of C- and MATH 124 or higher and senior standing required. This course will offer an understanding of the step by step decision making of pre-production processes involved in creating new products from design concept to the final consumer.

FDM 460. Sustainability in Fashion. 3 Hours.
PR: FDM 211 with a minimum grade of C- and PR or CONC: FDM 360 with a minimum grade of C- or consent. This course examines sustainability in the context of cultural, economic, environmental, social, and technological policies and procedures of fashion industries. Factors analyzed include ethics, government policies, international labor standards, environmental regulations, company priorities, consumer responsibilities, economic impact, and worker rights.

FDM 461. Omni-Channel Fashion Retailing. 3 Hours.
PR: FDM 211 or FDM 360 with a minimum grade of C- or consent. This course provides an overview of various channels of fashion retail distribution including catalogs, e-commerce, broadcast and brick & mortar formats. It will examine the principles and strategies applied by fashion retailers that market goods and/or services using an omni-channel retail business model.

FDM 471. Fashion Promotion. 3 Hours.
PR: FDM 360 with a minimum grade of C- and ADV 215 or instructor consent. In this course, students gain an understanding of promotion methods used in the fashion industry. It examines fashion forecasting and the creation of brand campaigns using a variety of different media. Students develop skills to communicate effectively within different fashion markets.

FDM 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practices as a tutor or assistant.

FDM 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Pre-arranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

FDM 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FDM 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

FDM 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

FDM 496. Senior Thesis. 1-3 Hours.
PR: Consent.

FDM 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

FDST 200. Food Science and Technology. 3 Hours.
Up-to-date basics of food science and technology, including; food industry outlook, degrees and careers, food chemistry, food processing and engineering, food microbiology and food safety, food biotechnology, and sensory evaluation of foods.

FDST 308. Food Plant Sanitation. 3 Hours.
PR: CHEM 111 or CHEM 115. Students will learn basic concepts of food processing and the laws and regulations governing it as well as good manufacturing practices involved in order to ensure the quality of food that is sold to the public.

FDST 365. Muscle Foods Technology. 3 Hours.
Emphasis on muscle of slaughtering, cutting, breaking, manufacturing, structure and composition, conversion of muscle to muscle food, processing food animals (cattle, sheep, hogs, poultry, and fish) and products to ensure quality and safety from processing through storage, fresh and value-added processing and nutritional value.

FDST 365L. Muscle Foods Technology Laboratory. 1 Hour.
PR or CONC: FDST 365. Laboratory training in the processing of carcasses derived from food animals including red meat, poultry, and fish species. Microbiology, cookery, and storage of fresh products. Basic techniques in processed muscle foods production.

FDST 445. Food Microbiology. 3 Hours.
PR: AEM 341. The relationships of microorganisms to food-borne illness and intoxications, microbial food safety and food quality, food spoilage, food preservation and bio-processing. The emerging food preservation technologies and predictive microbiology will be introduced.

FDST 445L. Food Microbiology Laboratory. 1 Hour.
PR or CONC: FDST 445. Laboratory training in methods used in microbiological examination of foods. This laboratory will provide a hands-on experience for students who take or have taken FDST 445.

FDST 450. Food Chemistry. 3 Hours.
PR: CHEM 116 or HN&F 171. The course applies basic and applied scientific principles to food chemistry and practical applications. Chemical/biochemical reactions of carbohydrates, lipids, proteins, and other constituents in fresh and processed foods are discussed with respect to food quality control. Reaction conditions and processes that affect color, flavor, texture, nutrition, and safety of food are emphasized.

FDST 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

FDST 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

FDST 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FDST 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

FDST 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.

FDST 496. Senior Thesis. 1-3 Hours.
PR: Consent.

FDST 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

FILM 101. The Art of Film 1. 3 Hours.
A survey of the history of cinema from its earliest forms and experimentation through the end of the monopoly of the studio system (c. 1960).

FILM 102. The Art of Film 2. 3 Hours.
A survey of the history of cinema from the rise of the auteur (c. 1960) to present trends, specifically examining American cultural dominance.

FIN 109. Introduction to Investing 1. 1 Hour.
Initiating a three-part series, this course provides a comprehensive foundation in capital markets and investing. Incorporating both theory and practical application, it elucidates various types of investment and introduces the differing roles of market participants.

FIN 209. Introduction to Investing 2. 1 Hour.
PR: FIN 109 with a minimum grade of C-. This course builds on the foundational concepts introduced in Introduction to Investing 1, delves into more complex topics, including ETF portfolio management, business cycle analysis, effective implementation of a value investing strategy, and the identification of companies with sustainable competitive advantages.

FIN 250. Seminar in Financial Planning. 1 Hour.
This seminar will provide a wholistic and applied approach to personal finance. Topics will include the financial planning process; building and maintaining credit; cash flow and debt management; planning elements of risk management; investment planning; and retirement planning.

FIN 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FIN 305. Intermediate Finance. 3 Hours.
PR: BCOR 340 or FIN 325 with a minimum grade of B-. Core course in corporate finance theory and practice and builds on the concepts introduced in the BCOR 340 and includes the use of excel to help solve extended problems and/or short cases. Topics covered include corporate valuation, cost of capital, and capital budgeting.

FIN 309. Experiential Investing. 1 Hour.
PR: FIN 209 with a minimum grade of C-. Experiential Investing is the final course in a three-part series designed to provide students with hands-on experience in managing an investment portfolio.

FIN 310. Investments. 3 Hours.
PR: WVU sections require BCOR 340 with a minimum grade of B- , WVUIT sections require BCOR 340 or FIN 325 with a minimum grade of B-. Investment analysis and management for the individual and the financial institution.

FIN 315. Financial Data Analytics. 3 Hours.
PR: BCOR 340 with a minimum grade of B-. Use computers to analyze both simulated and real data using statistical methods. This course will provide a review of probability and statistical concepts, regression methods, and the application of Python in data analysis.

FIN 320. Financial Statements Analysis. 3 Hours.
PR: (BCOR 340 or FIN 325) with a minimum grade of B-. This course analyzes financial accounting statements from the perspective of investors and stakeholders for the purpose of making sound decisions in business and financial investments.

FIN 330. Financial Institutions. 3 Hours.
PR or CONC: BCOR 340 with a minimum grade of B-. The role of financial institutions in our nation's financial markets and the economy. Analysis of interest rate, financial markets and federal revenue policy.

FIN 340. Real Estate Finance. 3 Hours.
An introduction to investing in real estate.

FIN 350. General Insurance. 3 Hours.
Theory of risk and its application to insurance; principles underlying insurance- life, property, casualty, fire, and surety.

FIN 370. Personal Finance. 3 Hours.
PR: BCOR 340 with a minimum grade of B-. Students develop a personal financial life-plan as well as gain an understanding of how to produce plans for others. Topical coverage includes self-assessment of financial planning acumen, cash/credit management, insurance coverage, investing components, tax planning, retirement/estate planning and special circumstance planning.

FIN 410. Security Analysis and Portfolio Management. 3 Hours.
PR: FIN 310 with a minimum grade of B- and FIN 305. The systematic selection, assessment, and ranking of corporate securities in a portfolio framework through a synthesis of fundamental analysis, technical analysis, and the random walk perspective.

FIN 411. Options, Futures and Other Derivatives. 3 Hours.
PR: FIN 310 with a minimum grade of B- and FIN 305. Examines derivatives markets and introduces the concept of arbitrage with the implications for derivatives equilibrium pricing. Also covers applications of derivatives in financial risk management.

FIN 420. Business Valuation. 3 Hours.
PR: FIN 305. Develop the basic knowledge necessary to value an entire company or a division of a company using non-proprietary models. Analysis includes a practical consideration of financial market operations, comparisons of business opportunities and how they change over time, and the elements of the decision-making criteria for a financial manager or investor.

FIN 421. Mergers and Acquisitions. 3 Hours.
PR: FIN 420 with a minimum grade of C and FIN 305. Mergers and acquisitions are value drivers in financial markets, allowing the companies to grow and reinvent themselves. This course provides students with the skills necessary to measure and enhance corporate valuation in equity markets.

FIN 422. Advanced Financial Statement Analysis. 3 Hours.
PR: FIN 320 with a minimum grade of B- or instructor approval. This course is an extension of FIN 320 and will address special topics relating to financial statement analysis for private, public and not-for-profit entities.

FIN 430. Energy Financial Economics. 3 Hours.
PR: BCOR 340 with a minimum grade of B-. Introduces students to ways in which legal/regulatory systems affect the energy industry, and to important economic and political concerns that underlie the regulation of production and sale of energy. The course will be comparative: that is, while much of our focus will be on the American regulatory system, we will consider regulatory regimes from other countries as well.

FIN 431. Energy Law and Regulations. 3 Hours.
PR: BCOR 340 with a minimum grade of B-. A brief history of energy development, the law and regulations governing that development, and a look at the policy behind our current system. We will look at ownership of energy sources relating to production, basic legal, ethical, and policy decisions regarding markets and regulations, methods of production, and the externalities associated with specific source development.

FIN 432. Energy Financial Accounting. 3 Hours.
PR: BCOR 340 with a minimum grade of B-. The course is designed to give students the tools to interpret and analyze external financial information from the viewpoint of investors and creditors. The energy sector has a unique perspective from other industry sectors. In particular, the role of mark to market accounting techniques will be emphasized in your application of financial statement analysis to the energy sector.

FIN 433. Energy Financial Risk Management. 3 Hours.
PR: FIN 411 with a minimum grade of C-. The course investigates the evolving and expanding practice of financial risk management in the energy sector. Risk management is a complex process of identifying, quantifying and managing various risk exposures. The course analyzes and discusses the various sources of risk. Particular attention is devoted to the main risk management techniques such as Value at Risk (VaR), volatility models, and correlation.

FIN 450. Working Capital Management. 3 Hours.
PR: BCOR 340 and ECON 225 and PR or CONC: FIN 305. Management of current assets and liabilities. Topics include the management of cash, marketable securities, accounts receivable, inventories, trade accounts payable, and short term bank borrowings. Decision models are used extensively.

FIN 451. Life and Health Insurance. 3 Hours.
PR: FIN 350 with a minimum grade of C-. The basics of life and health insurance products and practices are introduced. Students will learn the rationale and importance of the use of these products in various scenarios.

FIN 452. Employee Benefit Plans. 3 Hours.
PR: FIN 350 with a minimum grade of C-. Use, design, and regulation of group life insurance, health care, and pensions, including their federal tax consequences. Study of the available contracts in each area and financing alternatives and practices.

FIN 453. Estate and Tax Planning for Financial Advisors. 3 Hours.
PR: FIN 350 with a minimum grade of C-. This course introduces you to the process of transferring assets and managing end-of life decisions for individuals/families and the role that estate planning takes in the financial planning process. The purpose of the income tax portion of this course is to teach students the fundamental income tax planning and management concepts that are essential for effective comprehensive financial planning.

FIN 454. Property and Liability Insurance. 3 Hours.
PR: FIN 350 with a minimum grade of C-. Study of the use and production of property and liability insurance, including evaluation of insurance contracts and current insurance practices; legal and regulatory environment affecting use and production of insurance.

FIN 455. Risk Management. 3 Hours.
PR: FIN 350 with a minimum grade of C-. Transferable risks with which the entrepreneur must deal. Emphasis on the process by which decisions are made for handling these risks, including an examination of contributions and limitations of insurance system.

FIN 460. Bank Management. 3 Hours.
PR: (BCOR 340 or FIN 325) and FIN 330 and PR or CONC: FIN 305. Introduction to bank management and builds on the topics introduced in FIN 330. The course will apply traditional finance concepts to the management of financial institutions. Topics covered include bank financial statement analysis, principles of lending and investment, and government policy relationships to bank organization and profitability. (May not be taken for both undergraduate and graduate credit.).

FIN 461. Applied Bank Management. 3 Hours.
PR: FIN 330 with a minimum grade of C-. An applied course in commercial banking involving problems of management of the money position, loan and investment portfolio, and capital adequacy. The student simulates actual bank operations, conducts case studies, and analyzes bank performance.

FIN 465. Applied Investment Management. 3 Hours.
PR or CONC: FIN 310 with a minimum grade of C- and successful performance on a professional interview, a competitive score on a formal assessment of investment knowledge. This course is an application based investments course covering topics ranging from fundamental and technical analyses, economic fundamentals, and active portfolio management strategies and techniques. The course is designed to provide students with hand-on experience with capital markets, asset allocation, and the use of the Bloomberg terminal to make investment decisions.

FIN 470. Advanced Corporate Finance. 3 Hours.
PR: FIN 305. An integrative course which implements case studies to provide a practical and deep understanding of advanced corporate finance topics. Focuses on making financial projections and analysis to assist in providing economically relevant recommendations. Finance topics related to government and non-for-profit entities are introduced.

FIN 480. International Finance. 3 Hours.
PR: (BCOR 340 or FIN 325) with a minimum grade of B- and FIN 305 and FIN 310 and FIN 315 and FIN 330. Comprehensive coverage of international finance. We will examine the economics of international markets and determinants of exchange rates in both theory and practice. Examines a variety of financial contracts that can be used to manage exchange rate risk. These various concepts and tools will be applied to improve financial decision-making in an international context.

FIN 485. Advanced Topics in Financial Planning. 3 Hours.
PR: FIN 370. Advanced topics in financial planning including synthesis of income tax planning, investments, insurance planning, estate planning, and retirement planning into a comprehensive, application driven process.

FIN 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

FIN 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 6 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

FIN 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FIN 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

FIN 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

FIN 496. Senior Thesis. 1-3 Hours.
PR: Consent.

FIN 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

FIS 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

FIS 194. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

FIS 199. Orientation to Forensic Investigative Science. 1,2 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities and opportunities.

FIS 201. Introduction to Forensic Identification. 3 Hours.
A survey course in forensic science including overview of the various scientific disciplines that handle crime scene evidence and the systematic method of evidence analysis. Students learn about the collection, preservation, and methods of analysis of biological, chemical, and physical evidence.

FIS 202. Crime Scene Investigation Overview. 3 Hours.
PR: FIS 201 with a minimum grade of C-. An overview of the crime scene investigation process for the non-examiner. Course topics include: safety, evidence collection, processing, and documentation. Virtual scenarios will serve as teaching aids.

FIS 301. Science/Technology of Fingerprint Identification. 3 Hours.
PR: FIS 201 with a minimum grade of C- and Coreq: FIS 301L and FIS majors only. Introduces basics of fingerprint analysis and comparisons. Focuses on basis patterns used in fingerprint comparisons and classifications of each fingerprint type, including Henry, National Crime Information Center, Integrated Automated Fingerprint Identification System pattern classification codes.

FIS 301L. Science/Technology of Fingerprint Identification Laboratory. 0 Hours.
PR: Corequisite of FIS 301. Fingerprint Technology - FIS 301 Laboratory.

FIS 302. Crime Scene Investigation 1. 3 Hours.
PR: FIS 201 with a minimum grade of C- and PR or CONC: FIS 302L or FIS 303 with a minimum grade of C-, Forensic Examiner majors only. Basic competencies required for crime scene examiners. Focus on developing a consistent approach to the processing of a crime scene with a major focus on recovery/processing of physical evidence.

FIS 302L. Crime Scene Investigation 1 Laboratory. 1 Hour.
PR: FIS 335 and FIS 335L and PR or CONC: FIS 302 and FIS 405 and FIS 405L with a minimum grade of C- in all, Forensic Examiner majors only. Introductory laboratory of crime scene investigation, covering skills from initial scene assessment through debriefing and clean-up. Scientific and practical methods of securing, collecting and analyzing this evidence will be taught and practiced.

FIS 305. Biological Evidence. 3 Hours.
PR: (FIS 202 or FIS 302) with a minimum grade of C- in each and Coreq: FIS 305L. Focuses on the collection and testing of body fluids as well as death scene investigation procedures.

FIS 305L. Biological Evidence Laboratory. 0 Hours.
Coreq: FIS 305. Biological Evidence - FIS 305 Laboratory.

FIS 306. Expert Testimony Perspectives. 3 Hours.
PR: FIS 201. A comprehensive review of expert testimony that broadens perspectives of the role of the scientist in the courtroom as well as improving expert witness capabilities.

FIS 311. Fingerprint Science. 3 Hours.
PR: FIS 201 with a minimum grade of C-. Focuses on a comprehensive overview of the science of fingerprints and introduction to latent fingerprints. Not open to FIS Examiner majors.

FIS 312. Applied Forensic Microscopy. 3 Hours.
PR: FIS 201 and (PHYS 102 or PHYS 112) with a minimum grade of C- and Coreq: FIS 312L. Introduction to fundamentals of microscopy including light theory, optics, image formation and more. Forensic-specific topics will also be covered including general forensic microscopy, hair and fiber observations and comparisons, ballistics, and trace evidence examination. Students will practice proper microscope care and techniques in the laboratory and learn how to utilize the fundamentals in a forensic application.

FIS 312L. Applied Forensic Microscopy Laboratory. 0 Hours.
PR: FIS 201 and (PHYS 102 or PHYS 112) with a minimum grade of C- and Coreq: FIS 312. Introduction to fundamentals of microscopy including light theory, optics, image formation and more. Forensic-specific topics will also be covered including general forensic microscopy, hair and fiber observations and comparisons, ballistics, and trace evidence examination. Students will practice proper microscope care and techniques in the laboratory and learn how to utilize the fundamentals in a forensic application.

FIS 314. Introduction to Microscopy. 3 Hours.
PR: CHEM 234 and (CHEM 234L or CHEM 236) and (PHYS 102 or PHYS 112) with a minimum grade of C- in each and Coreq: FIS 314L. Basic skills and theory of light, chemical and polarized light microscopy. Practice of proper technique associated with micro-manipulation, sample preparation, the care and maintenance of the microscope, and the origin and significance of qualitative and quantitative observations diagnostic of forensic trace evidence.

FIS 314L. Introduction to Microscopy Laboratory. 0 Hours.
PR: Corequisite of FIS 314. Introduction to Microscopy - FIS 314 Laboratory.

FIS 320. Science and Culture of Illicit Drugs. 3 Hours.
A survey of the major drugs of recreational use and abuse in the contemporary United States. Covers the chemical production of illicit drugs; associated paraphernalia; and the biochemistry and physical symptoms of consumption. Also explores the history and cultural significance of illicit drug consumption.

FIS 324. Molecular Genetics for Forensic Science. 3 Hours.
PR: BIOL 219 and BIOL 219L with a minimum grade of C- and PR or CONC: FIS 324L. This course cover a range of topics in molecular genetics with a special emphasis on topics and methodology relevant to forensic biology. These include DNA extraction, DNA quantification, electrophoresis, and PCR. The course also examines the various human genetic markers used in forensic DNA analysis such as STRs, SNPs, and mtDNA in depth.

FIS 324L. Molecular Genetics for Forensic Science Laboratory. 1 Hour.
PR: BIOL 219 and BIOL 219L with a minimum grade of C- and PR or CONC: FIS 324. Basic methods used in molecular genetic laboratories, including extraction, quantification, amplification and sequencing. Applications are focused on the specific techniques used in forensic biology for human identification.

FIS 330. Principles of Forensic Photography. 3 Hours.
PR: FIS 201. Introduces basic principles of forensic photography for the non-investigator. Includes the history of photography, theories behind photography, and techniques for photographing type of crime scenes and evidence.

FIS 335. Forensic Photography. 3 Hours.
PR: (PHYS 102 or PHYS 112) with a minimum grade of C-, Forensic Examiner majors only, and Coreq: FIS 335L. Focuses on the use of digital photography in forensic science. Topics include the use of digital cameras, scanners, photomicrography, and macrophotography to document a range of evidence types. Students will learn how such images may be processed and enhanced without compromising legal requirements.

FIS 335L. Forensic Photography Laboratory. 0 Hours.
PR: Corequisite of FIS 335. Forensic Photography - FIS 335 Laboratory.

FIS 340. Forensic Chemical Analysis. 3 Hours.
PR: CHEM 233 and (CHEM 233L or CHEM 235) with a minimum grade of C- in each and PR or CONC: (FIS 340L or FIS 341) with a minimum grade of C-. Development of critical thinking, writing and communication skills related to fundamental concepts of analytical instrumentation and its application to the forensic discipline.

FIS 340L. Forensic Chemical Analysis Laboratory. 1 Hour.
PR: CHEM 233 and (CHEM 233L or CHEM 235) with a minimum grade of C- in each and PR or CONC: FIS 340 with a minimum grade of C-. Laboratory skills with analytical instrumentation as applied in forensic science.

FIS 380. Social Relations of Forensic and Law Professionals. 3 Hours.
PR: FIS 201 with a minimum grade of C-. Introduction to the relationships among attorneys, experts, and law enforcement professionals: how individuals work together for the investigative process from the initial investigation to the courtroom.

FIS 385. Professional Internship Preparation. 1 Hour.
PR: CHEM 234 and CHEM 234L and (STAT 215 or STAT 312) with a minimum grade of C- in all. Development of professionalism in forensic science. Skills for career building and professional norms and behaviors will be presented. Students learn about internship sites, protocols for application, and expectations for on-the-job roles and behavior.

FIS 386. Forensic Identification Internship. 3-6 Hours.
PR: FIS 385 and one of the following sets of courses: (FIS 302 and FIS 302L) or (FIS 340 and FIS 340L) or (FIS 432 and FIS 432L) with a minimum grade of C- in every course. Supervised field or research experience in a forensic, research, or law enforcement setting. Provides students with relevant professional experience based on their forensic interest, skills, and knowledge. Develops professional and networking skills.

FIS 393. Special Topics. 1-6 Hours.
Investigation of topics not covered in regularly scheduled courses.

FIS 400. Population Genetics for Forensic Science. 3 Hours.
PR: FIS 324 and FIS 324L with a minimum grade of C- in each. This course explores basic population genetics as it is applied to forensic science. The fundamental concepts of Hardy Weinberg Equilibrium (HWE) and Linkage Equilibrium (LE) will be explored, as well as the role of population genetics in the interpretation of DNA evidence in forensic science.

FIS 401. Professional Forensic Communication. 3 Hours.
PR: ENGL 103 or (ENGL 101 and ENGL 102) and FIS 201. Familiarizes students with forensic literature, literature searching techniques, bibliographic software; and provides students with the writing and presentation skills essential to forensic professionals.

FIS 402. Crime Scene Investigation 2. 3 Hours.
PR: FIS 302 and FIS 302L with a minimum grade of C- in each and Forensic Examiner majors only and Coreq: FIS 402L. Continuation of FIS 302. Outlines procedures for collection of biological and trace evidence using scientific and practical methods of securing, collecting, analyzing this evidence, in accordance with known standards.

FIS 402L. Crime Scene Investigation 2 Laboratory. 0 Hours.
PR: Corequisite of FIS 402. Crime Scene Investigation 2 - FIS 402 Laboratory.

FIS 404. Law and Evidence. 3 Hours.
PR: FIS 385 with a minimum grade C-. This course presents a comprehensive review of the Federal Rules of Evidence as they pertain to forensic practitioners and the student's ability to relate legal precedents to procedures in collecting, processing, and securing evidence used in criminal cases.

FIS 405. Latent Fingerprint Examination and Comparison. 4 Hours.
PR: CHEM 233 and CHEM 233L and FIS 301 with a minimum grade of C- in each and Coreq: FIS 405L. Identification techniques used in fingerprint development for processing crime scenes and evidence for latent prints, focusing on latent print development and preservation, including crime scene processing and blood prints. Focuses on latent print comparisons as stipulated by FBI and IAI standards.

FIS 405L. Latent Fingerprint Laboratory. 0 Hours.
PR: Corequisite of FIS 405. Latent Fingerprint - FIS 405 Laboratory.

FIS 406L. Capstone: Courtroom Testimony and Laboratory. 3 Hours.
PR or CONC: FIS 404. A skills intensive course that combines in-class instruction with practical experience in the area of court testimony, legal writing presentation, and creation and presentation of exhibits in an actual court setting.

FIS 407. Gravesite Forensics. 3 Hours.
PR: (FIS 202 or FIS 302) with a minimum grade of C- and Coreq: FIS 407L. Introduction to terrestrial carrion decomposition and to the means of locating, excavating and recovering human remains deposits. This course also covers the identification of carrion-associated insects and their use in determining minimum postmortem interval.

FIS 407L. Gravesite Forensics Laboratory. 0 Hours.
PR: Corequisite of FIS 407. Gravesite Forensics - FIS 407 Laboratory.

FIS 409. Blood Stain Pattern Analysis. 3 Hours.
PR: FIS 402 and Coreq: FIS 409L. Scientific analysis of blood patterns at crime scene investigations and their applications in solving crimes.

FIS 409L. Bloodstain Pattern Analysis Laboratory. 0 Hours.
PR: Corequisite of FIS 409. Bloodstain Pattern Analysis - FIS 409 Laboratory.

FIS 414. Trace Evidence Examination. 3 Hours.
PR: (FIS 314 and FIS 314L) and (FIS 340 and FIS 340L or FIS 341) with a minimum grade of C- and PR or CONC: (FIS 414L or FIS 416) with a minimum grade of C-. Introduction to fundamental concepts for the identification, collection, examination and interpretation of trace evidence. Forensic analysis of glass, paint, tape, hairs, fibers, inks and firearm discharge residues.

FIS 414L. Trace Evidence Examination Laboratory. 1 Hour.
PR: (FIS 314 and FIS 314L) and (FIS 340 and FIS 340L or FIS 341) with a minimum grade of C- in each and PR or CONC: FIS 414 with a minimum grade of C-. Development of laboratory skills for forensic examination of trace evidence, including collection, recovery, preservation, analysis, and interpretation of trace materials commonly analyzed in crime laboratories (glass, paint, tapes and adhesives, gunshot residues, inks and paper, soil, fibers and hair).

FIS 421. Introduction to Firearms Examination. 3 Hours.
PR or CONC: FIS 335 with a minimum grade of C- and Coreq: FIS 421L. Fundamentals of firearms-related evidence. Detailed study of design, mechanism, and manufacture of firearms as well as interior, exterior, and terminal ballistics. Includes a laboratory component.

FIS 421L. Introduction to Firearms Examination Laboratory. 0 Hours.
Coreq: FIS 421. Introduction to Firearms Examination - FIS 421 Laboratory.

FIS 427. Medicolegal Forensics. 3 Hours.
PR: FIS 201 with a minimum grade of C- and PR or CONC: (FIS 202 or FIS 302 with a minimum grade of C-) and Coreq: FIS 427L. Introduction to medicolegal death investigation from historical reference to modern day application. Course topics include overview of cause and manner of death with assessment and documentation of the body at the scene with proper use and knowledge of basic medical terminology. Warning: This course will contain graphic images and exposure to human remains.

FIS 427L. Medicolegal Forensics Laboratory. 0 Hours.
PR: Corequisite of FIS 427. Course emphasizes the practical and hands-on aspects of medicolegal death investigation. Topics include evidence collection and protection, scene documentation, and application of medical concepts to forensic investigation.

FIS 432. Forensic Biology. 3 Hours.
PR: BIOL 219 and PR or CONC: (BIOL 434 or FIS 432L). Biological applications and advances in forensic identification technologies, including advantages and limitations of different approaches. Focuses on isolation, quantification, amplification, and analysis of DNA.

FIS 432L. Forensic Biology Laboratory. 1 Hour.
PR or CONC: BIOL 432 or FIS 432. Prepares students in the processing of biological samples for DNA analysis, including presumptive and confirmatory testing, isolation of nuclear DNA, quantification, amplification, and analysis of DNA. Extensive hands-on practical experience and application of knowledge.

FIS 435. Advanced Forensic Photography. 3 Hours.
PR: FIS 335 and Coreq: FIS 435L, and restricted to Forensic Biology, Forensic Chemistry, and Forensic Examiner majors. In-depth photography course for students who wish to pursue forensic photography as a possible employment option upon graduation.

FIS 435L. Advanced Forensic Photography Laboratory. 0 Hours.
PR: Corequisite of FIS 435. Advanced Forensic Photography - FIS 435 Laboratory.

FIS 450. Computational Forensics. 3 Hours.
PR: MATH 155 or consent. An introductory-level course exposing students to non-traditional and technology driven approaches to forensic analysis, with specific emphasis on forensic imaging, analytical modeling, and computer programming.

FIS 451. Arson and Explosives Analysis. 3 Hours.
PR: FIS 340 and (FIS 340L or FIS 341) with a minimum grade of C- in each and PR or CONC: (FIS 451L or FIS 452) with a minimum grade of C-. Examines the chemistry of combustion and the chemical analysis of ignitable liquids, explosives and post-combustion residues. The course relies heavily on instrumental methods of analysis, including various forms of chromatography and mass spectrometry. A laboratory component provides hands-on experience with interpreting data involving ignitable liquid residues and explosives.

FIS 451L. Arson and Explosives Analysis Laboratory. 1 Hour.
PR: FIS 340 and (FIS 340L or FIS 341) with a minimum grade of C- in each and PR or CONC: FIS 451 with a minimum grade of C-. Develops laboratory skills related to chemical analysis of ignitable liquids, explosives and post-combustion residues. Emphasis on instrumental methods of analysis, including various forms of chromatography and mass spectrometry and extensive hands-on experience interpreting data derived from analyzing ignitable liquid residues and explosives.

FIS 460. Analysis of Seized Drugs. 3 Hours.
PR: FIS 340 and (FIS 340L or FIS 341) with a minimum grade of C- in each and PR or CONC: (FIS 460L or FIS 461) with a minimum grade of C-. Develops students' abilities to properly conduct seized drug analyses, including: 1) the history and origin of drugs of abuse; 2) the appropriate handling and storage of evidence/samples; 3) selecting appropriate analytical schemes for the identification of seized drugs; 4) the scheduling of controlled substances; 5) techniques to understand the synthetic pathways and distribution networks of seized drugs.

FIS 460L. Analysis of Seized Drugs Laboratory. 1 Hour.
PR: FIS 340 and (FIS 340L or FIS 341) with a minimum grade of C- in each and PR or CONC: FIS 460 with a minimum grade of C-. Develops laboratory skills applicable to the chemical analysis of seized drugs. Emphasis on instrumental methods of analysis, including various forms of chromatography and mass spectrometry, and extensive hands-on experience with the interpretation of data involving analysis of unknown seized drugs.

FIS 470. Analytical Forensic Toxicology. 3 Hours.
PR: FIS 460 and (FIS 460L or FIS 461) with a minimum grade of C- in each and PR or CONC: FIS 470L or FIS 471 with a minimum grade of C-. Application of fundamental principles of mode(s) of action of different drugs, the primary mechanisms of drug administration and distribution, drug metabolism and the excretion of xenobiotics. Current and historical cases.

FIS 470L. Analytical Forensic Toxicology Laboratory. 1 Hour.
PR: FIS 460 and (FIS 460L or FIS 461) with a minimum grade of C- in each and PR or CONC: FIS 470 with a minimum grade of C-. Develops laboratory skills applicable to forensic toxicological analysis of drugs. Students practice using sample preparation strategies such as liquid-liquid extraction, solid phase extraction, derivatization, and instrumental analysis techniques for screening and confirmation via chromatography and mass spectrometry.

FIS 480. Forensic Quality Assurance. 2 Hours.
PR: FIS 201. Quality assurance in a laboratory setting to include quality control/assurance, management, and application of statics. ASCLD-LAB and ISO accreditation and professional certification procedures.

FIS 485. Professional Ethics in Forensic Science. 3 Hours.
Foundational ethical concepts as they relate to forensic science and other associated professional cultures. Applied case-study examples are used to analyze ethical and moral boundaries of practice.

FIS 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

FIS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

FIS 492. Directed Study. 1-3 Hours.
Directed Study, reading, and/or research.

FIS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FIS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

FIS 497. Research. 1-6 Hours.
Independent research projects.

FIS 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

FLIT 216. Chinese Literature Translation 1. 3 Hours.
Readings in the literature of China from its beginnings through the end of the imperial era in 1922; attention to major writers and genres; focus on literary history. Readings, and discussion in English.

FLIT 217. Chinese Literature in Translation 2. 3 Hours.
Selected Chinese literary works since 1911; attention to major writers and genres; readings and discussion in English.

FLIT 239. Francophone Literature in Translation. 3 Hours.
Works by French-speaking authors from Africa and the Caribbean. French majors will read selections in the original.

FLIT 264. Spanish Literature Translation 1. 3 Hours.
Selected Spanish works from the twelfth century to the end of the eighteenth century. Readings and discussions in English.

FLIT 266. Latin American Literature. 3 Hours.
An introduction to the diverse literary traditions of Latin America, this survey explores the historical roots that gave rise to modern Latin American literature.

FLIT 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FLIT 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

FLIT 315. Modern Arabic Literature. 3 Hours.
Introduces students to major Arabic authors and acclaimed selections from Arabic literature of the 20th and 21st centuries, as well as historical landmarks that have contributed to the evolution of this literature. Taught in English.

FLIT 316. Arab Women Writers. 3 Hours.
Study of works by Arab women writers, created originally in Arabic and English, selected to introduce students to the literary traditions and historical contexts within which Arab women's writings are situated and to explore the themes and genre issues of those writings.

FLIT 361. Latin American Literature and Violence. 3 Hours.
Examination of key works of Latin American cultural production in translation related to contexts of physical and structural violence.

FLIT 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FLIT 426. Love and War in German Literature. 3 Hours.
Survey of German literature from 1800-1960. Readings and discussions in English.

FLIT 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

FLIT 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

FLIT 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FLIT 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

FLIT 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

FLIT 496. Senior Thesis. 1-3 Hours.
PR: Consent.

FLIT 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

FNRS 100. Forest Resources in United States History. 3 Hours.
Examines human use of forest resources in America from pre-Colombian times to present. Exploration of factors that impact the use of wood products.

FNRS 101. Careers in Natural Resources Management 1. 1 Hour.
An introduction to professional activities in forest resources management, recreation and parks management, wildlife and fisheries management, and wood science and utilization. Survey of major issues in natural resources management and conservation. (Required only for students who rank as freshman in the Division of Forestry.).

FNRS 111. Introduction to Land Reclamation. 1 Hour.
This course is designed to introduce students to the broad knowledge areas associated with land reclamation throughout central Appalachian region. Each weekly learning module will be developed by the local expert for that topic area.

FNRS 140. West Virginia's Natural Resources. 3 Hours.
Survey of policies and practices in development and use of soil, water, forest, wildlife, mineral, and human resources in West Virginia.

FNRS 150. Edible and Medicinal Plants of Appalachian Folk Medicine. 3 Hours.
Folk medicine (herbalism) is surging as people move away from industrially processed foods toward more traditional plant-based diets, have less access to medical care, or want to be more self-sufficient and learn simple preventative home remedies. This course provides a basic understanding of Appalachian folk-medicine by exploring accessible, sustainable, responsible, and safe ways of using common plants to support well-being.

FNRS 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

FNRS 203. Careers in Natural Resources Management 2. 1 Hour.
Planning a career in forestry and natural resources professions. Developing a career strategy, resume building, and conducting a successful job search.

FNRS 205. Dendrology. 2 Hours.
PR or CONC: FNRS 205L. Classification and silvical characteristics of North American forest trees.

FNRS 205L. Dendrology Laboratory. 1 Hour.
PR or CONC: FNRS 205 or FOR 205. Dendrology - FNRS 205 Laboratory.

FNRS 206L. Winter Dendrology Laboratory. 1 Hour.
PR: FOR 205 or (FNRS 205 and FNRS 205L) or equivalent. Field identification and classification of North American forest trees during leaf-off condition.

FNRS 210. Sustainable Utilization of Biomaterials. 3 Hours.
Forest ecosystems offer substantial and diverse biomaterials which can mitigate the environmental impact of their processing. This course explores how innovative bio-based solutions can shape a greener future. We examine the sustainability of forest ecosystems and renewable biomaterials, eco-friendly packaging, and energy-efficient biomaterials, urban forest utilization, and circular economy principles, explore carbon management strategies to reduce emissions and enhance sustainability.

FNRS 211. Careers and Professional Development in Sustainable Land Reclamation Management. 1 Hour.
This course introduces career pathways pertaining to land reclamation. Professional development topics are discussed to further prepare students for academic success and to advance career readiness. Course is delivered using a series of online modules.

FNRS 212. Forest Ecology. 3 Hours.
How forest ecosystems work: their role in the global ecosystem, variability of forests in space and time, forest structure and function.

FNRS 212L. Forest Ecology Laboratory. 1 Hour.
PR or CONC: FNRS 212 lecture, can be taken concurrently. Forest Ecology - FNRS 212 Laboratory. Central concepts of forest ecology are practiced through the collection, analysis, and interpretation of experimental data. Findings are communicated as an oral presentation and written report.

FNRS 222. Forest Mensuration. 4 Hours.
PR: MATH 124 or higher and Coreq: FNRS 222L. Estimating volume and growth of trees and forest stands with emphasis on the mathematical and statistical techniques involved. Laboratories include practical field experience.

FNRS 222L. Forest Mensuration Laboratory. 0 Hours.
PR: Corequisite of FNRS 222. Forest Mensuration - FNRS 222 Laboratory.

FNRS 223. Wood Anatomy and Structure. 3 Hours.
PR: Corequisite of FNRS 223L. Anatomy and structure of commercial wood species of the U.S. Survey of basic properties of wood.

FNRS 223L. Wood Anatomy and Structure Laboratory. 0 Hours.
PR: Corequisite of FNRS 223. Wood Anatomy and Structure - FNRS 223 Laboratory.

FNRS 225. Finished Wood Products. 3 Hours.
Exploration of the different materials used in low-rise residential and commercial construction applications for finishing and design aspects. Emphasis will be placed on wood products.

FNRS 232. Wood Grading and Procurement. 3 Hours.
PR: Corequisite of FNRS 232L and Forestry major or consent. Conversion and grading of raw materials in log form to primary wood products. Introduction to timber procurement systems.

FNRS 232L. Wood Grading and Procurement Laboratory. 0 Hours.
PR: Corequisite of FNRS 232. Wood Grading and Procurement - FNRS 232 Laboratory.

FNRS 240. Introduction to Computing in Natural Resources. 3 Hours.
PR: Corequisite of FNRS 240L. Introduction to computer applications in natural resource management. Emphasis on MS Excel statistical analysis tools, MS Access, Visual Basic Programming, hand held PCs and application examples.

FNRS 240L. Introduction to Computing in Natural Resources Laboratory. 0 Hours.
FNRS 240L. Introduction to Computing in Natural Resources Laboratory. PR: Corequisite of FNRS 240. Introduction to Computing in Natural Resources - FNRS 240 Laboratory.

FNRS 245. Residential Building Materials. 3 Hours.
Exploration of the different building materials used in residential and commercial construction. Emphasis will be placed on solid and engineered wood products as well as their manufacturing processes.

FNRS 251. Forest Fire Protection. 2 Hours.
Prevention, detection, and control of wildfires. Forest fuels, fire weather, and wildfire behavior. Use of fire for forest management purposes.

FNRS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FNRS 300. Forest Resources Management Field Practice. 6 Hours.

FNRS 301L. Forest Resources & Conservation Summer Practicum. 3 Hours.
PR: FNRS 205 and FNRS 205L and FNRS 222 and FNRS 222L. This course is designed to provide students with an in-depth, field-based learning experience. These activities generally involve significant time dedicated to one or more activities in the field, often at a distance from campus.

FNRS 310. Elements of Silviculture. 3 Hours.
PR: FNRS 205 or FOR 205. Basics of mensuration, site quality, tree and stand growth, forest structure, and development, intermediate treatments, natural disturbances and regeneration ecology, silviculture systems.

FNRS 311. Silvicultural Systems. 4 Hours.
PR: (FMAN 222 or (FNRS 222 and FNRS 222L) and (FNRS 205 and FNRS 205L) or FOR 205) and Coreq: FNRS 311L. The theory and practice of controlling forest stand establishment, composition, structure, and growth. Systems include: reproduction methods, release operations, and intermediate treatments. Pre-requisite(s) and/or co-requisite(s) may differ on regional campuses.

FNRS 311L. Silvicultural Systems Laboratory. 0 Hours.
PR: Corequisite of FNRS 311. Silvicultural Systems - FNRS 311 Laboratory.

FNRS 312. Projects in Sustainable Land Reclamation Management. 3 Hours.
This course will give students a practical overview of land reclamation techniques as applied in the field. During this intensive one-week summer course, students will visit various stages of land reclamation associated with extractive industries in the central Appalachian region. Students will be asked to prepare their own reclamation plans.

FNRS 315. Survey of Arboriculture. 1 Hour.
PR: (HORT 260 or FOR 205) or (HORT 260 and HORT 260L and FNRS 205 and FNRS 205L). A self-study seminar that surveys the principles and practices involved in the field of arboriculture with major emphasis on the urban landscape.

FNRS 320. Sustainable Construction. 3 Hours.
Introduction to common building practices used in residential construction with emphasis on sustainable, green construction.

FNRS 322. Advanced Forest Measurements. 3 Hours.
PR: FMAN 222 or (FNRS 222 and FNRS 222L) or equivalent. Measurement and computer simulation of forest growth; principles of growth and yield; statistical methods applied to forest measurement problems.

FNRS 326. Remote Sensing of Environment. 3 Hours.
PR: (MATH 126A or MATH 126B or MATH 126C) and MATH 128. Measurement and interpretation of natural resources and environment from photography and radar, infrared, and microwave imagery.

FNRS 330. Principles of Forestry Economics. 4 Hours.
PR: (ARE 150 or ECON 201) and Coreq: FNRS 330L. Production, distribution and use of forest goods and services. Emphasis on methods and problem solving techniques in the economic aspects of forestry.

FNRS 330L. Principles of Forestry Economics Laboratory. 0 Hours.
PR: Corequisite of FNRS 330. Principles of Forestry Economics - FNRS 330 Laboratory.

FNRS 333. Wood Machining. 3 Hours.
Introduction to basic concepts of wood machining with emphasis on production equipment and furniture manufacturing. Special topics of wood joining techniques and methods. Analysis of operational safety, health hazards and accident prevention. (Fall of even years.).

FNRS 335. Fire Ecology. 3 Hours.
Effects of wildfire on various aspects of ecosystems. Topics include fire history and historic fire regimes; the physical processes of combustion, heat transfer and fire behavior; interactions with soil, water, vegetation, and climate; and how fire affects cultural resources and the economy.

FNRS 337. Wood Adhesion and Finishing. 3 Hours.
PR: Corequisite of FNRS 337L and Wood Industry major or consent. Fundamentals of the bonding and finishing of wood including preparation, processing, and evaluation of adhesive and finishing systems.

FNRS 337L. Wood Adhesion and Finishing Laboratory. 0 Hours.
PR: Corequisite of FNRS 337. Wood Adhesion and Finishing - FNRS 337 Laboratory.

FNRS 340. Physical Properties of Wood. 3 Hours.
PR: (FNRS 223 and FNRS 223L) or WDSC 223) and Coreq: FNRS 340L. Specific gravity and density of wood; relationships between wood and liquids and applications in wood seasoning; thermal electrical and acoustical properties.

FNRS 340L. Physical Properties of Wood Laboratory. 0 Hours.
PR: Corequisite of FNRS 340. Physical Properties of Wood - FNRS 340 Laboratory.

FNRS 341. Wood Mechanics. 3 Hours.
PR: MATH 124 or higher and PHYS 101 and Coreq: FNRS 341L and Wood Science major or consent. Introduction to static properties of selections, elementary mechanics of deformable bodies, axial loading, column and beam analysis, and design considerations.

FNRS 341L. Wood Mechanics Laboratory. 0 Hours.
PR: Corequisite of FNRS 341. Wood Mechanics - FNRS 341 Laboratory.

FNRS 342. Natural Resource Entrepreneurship. 3 Hours.
Principles of small business start-up, organization, marketing, finance, and management with an emphasis on natural resource-based enterprises.

FNRS 344. River Conservation & Management. 3 Hours.
Synthesis of hydrological processes and concepts of river and watershed conservation and management. Course emphasizes hydrology, climatology, and ecology processes and principles of watershed management to obtain river and water resources sustainability.

FNRS 344S. River Conservation and Management. 0 Hours.
Synthesis of hydrological processes and concepts of river and watershed conservation and management. Course emphasizes hydrology, climatology, and ecology processes and principles of watershed management to obtain river and water resources sustainability.

FNRS 351. Forest Products Protection. 3 Hours.
PR: Corequisite of FNRS 351L. Biological organisms responsible for deterioration of wood products, their control by preservative methods, and study of fire retarding methods.

FNRS 351L. Forest Products Protection Laboratory. 0 Hours.
PR: Corequisite of FNRS 351. Forest Products Protection - FNRS 351 Laboratory.

FNRS 355. Arboriculture-Urban Tree Care. 3 Hours.
Students will learn how to promote a sustainable landscape by managing urban tree health through proper selection, planting, and pruning of trees.

FNRS 362. Decision Making and Quality Management. 3 Hours.
PR: MATH 124 and STAT 211 and Coreq: FNRS 362L. Effective decision-making and quality management are essential for organizational success in today's competitive environment. This comprehensive course equips students with the tools and techniques to analyze complex scenarios, optimize resources, and implement world-class quality systems. This course integrates analytical techniques with real-world applications, preparing students for leadership roles in decision-making and quality management across industries.

FNRS 362L. Forest Product Decision-Making Laboratory. 0 Hours.
PR: Corequisite of FNRS 362. Laboratory course for FNRS 362.

FNRS 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FNRS 400. Forest Resources Management Field Practice. 6 Hours.
PR: CE 200 and (FMAN 322 or (FNRS 322 and FNRS 322L). Application and study of forest management practices with emphasis on field problems, including a one-week trip to observe forestry outside the Appalachian hardwood region. (Course will be taught during five consecutive six-day weeks.).

FNRS 401. Wood Industries Field Trip. 1 Hour.
A one-week trip to observe manufacturing methods and techniques of commercial wood industry plants. Plants visited include furniture, plywood, veneer, hardboard, pulp and paper, sawmilling, and preservation.

FNRS 402. Forest Measurement Field Practice. 3 Hours.
PR: CE 200 and (FNRS 205 and FNRS 205L) or FOR 205) and (FMAN 322 or FNRS 322) and CE 200 and must be a Wood Industry major. Application of surveying and mensurational practices with emphasis on field problems.

FNRS 411. Sugarbush Management and Maple Syrup Production. 3 Hours.
PR: Corequisite of FNRS 411L. Introduces students to modern maple syrup production. Students will participate in all aspects of the WVU maple syrup operation, from sap collection to making finished syrup. Students will also perform an end of year financial assessment.

FNRS 411L. Sugarbush Management and Maple Syrup Production Laboratory. 0 Hours.
FNRS 411L. Sugarbush Management and Maple Syrup Production Laboratory. PR: Corequisite of FNRS 411. Sugarbush Management and Maple Syrup Production - FNRS 411 Laboratory.

FNRS 413. Wood Chemistry. 3 Hours.
PR: Corequisite of FNRS 413L and Wood Science major or consent. Chemical composition of wood including cellulose, hemicellulose, and extractives. Chemical processing of wood.

FNRS 413L. Wood Chemistry Laboratory. 0 Hours.
PR: Corequisite of FNRS 413. Wood Chemistry - FNRS 413 Laboratory.

FNRS 415. Regional Silviculture. 3 Hours.
PR: FMAN 212 or (FNRS 212 and FNRS 211L) and PR or CONC: FMAN 311 or FNRS 310 or (FNRS 311 and FNRS 311L) or FOR 310 and Forestry major or consent. Major forest types of the United States; their composition, management, problems, and silvicultural treatment.

FNRS 420. Forest Roads. 4 Hours.
PR: CE 200 and CS 101. A study of techniques and methods of design, layout and construction details of various standards of forest roads.

FNRS 421. Renewable Resources Policy and Governance. 3 Hours.
PR: Consent. Forest, wildlife, fisheries, and recreation resource policies of world, with an emphasis on the U.S.: important federal and state laws; governance of public and private lands and renewable natural resources. (Crosslisted with WMAN 421.).

FNRS 422. Harvesting Forest Products. 3 Hours.
PR: Corequisite of FNRS 422L. Analysis of ground-based and cable harvesting systems, including time and motion studies, productivity and cost analysis, occupational safety and health, environmental issues, equipment evaluation and selection, and trucking of forest products.

FNRS 422L. Harvesting Forest Products Laboratory. 0 Hours.
PR: Corequisite of FNRS 422. Harvesting Forest Products - FNRS 422 Laboratory.

FNRS 423. Sustainable Urban Forests. 3 Hours.
PR: Must be a junior or senior status to take this class. This course equips you with the knowledge and tools to manage urban trees as part of a sustainable environment. Through in-class discussions, we explore how urban forests contribute to local communities, offering sociological, environmental, economic, and aesthetic benefits.

FNRS 424. Vegetation of West Virginia. 2 Hours.
PR: FNRS 205 and FNRS 205L with a minimum grade of C-. Basics of plant taxonomy and community ecology use of technical field keys, study of selected plant families, field trips to unusual and/or important plant communities and forest types in West Virginia. (Summer, off campus.).

FNRS 424L. Vegetation of West Virginia Laboratory. 1 Hour.
PR: FNRS 205 and FNRS 205L with a minimum grade of C- and PR or CONC: FNRS 424. Vegetation of West Virginia - FNRS 424 Laboratory.

FNRS 425. Global Forest Resources. 3 Hours.
Significance of renewable natural resources on a global scale and the ecological, economic, and social contexts in which they are managed. Emphasis is on world forest resources, including timber, wildlife, and social uses.

FNRS 426. Global Forest Resources Practicum. 3 Hours.
PR: Consent. An intensive field practicum abroad provides students with experiential learning opportunities of global approaches to forest management, and imparts the historical context necessary for an appreciation of cultural diversity.

FNRS 430. Forest Environmental Conservation. 3 Hours.
PR: FNRS 344. This course will cover land use history, disturbance events and pressures driving change to forest resources. We focus on regional efforts to restore, enhance, and maintain forest ecosystem services. We will utilize a combination of lecture, guest presentations, student-led discussions, and field activities with conservation organizations to provide students with tools and application in practice in the conservation profession.

FNRS 433. Forest Management. 3 Hours.
PR: (FMAN 400 or FNRS 400) and (FMAN 311 or (FNRS 311 and FNRS 311L) and (FMAN 330 or (FNRS 330 and FNRS 330L). Principles of sustained yield forest management: organization of forest areas, selection of management objectives, application of silvicultural systems, and regulation of cut. Principles of sustainable forestry and ecosystem management.

FNRS 434. Forest Resources Management Planning. 3 Hours.
PR: Corequisite of FNRS 434S. Integrated planning of long-term management of forest resources. Development of a management plan for an actual forest tract. Emphasis on biological, social, economic and ethical considerations in decision-making.

FNRS 434S. Forest Resources Management Planning Studio. 0 Hours.
PR: Corequisite of FNRS 434. Forest Resources Management Planning Studio.

FNRS 435. Applied Environmental Justice. 3 Hours.
This project-driven, problem-based course explores the foundational concepts and historical development of environmental and climate justice frameworks. Students will examine their real-world application to communities across the United States, engaging with key issues such as flooding, pollution, land use, and adaptation.

FNRS 438. Human Dimensions Natural Resource Management. 3 Hours.
This class is designed to provide junior-and-senior level forestry and natural resource management majors with a repertoire of social and communication knowledge and skills such as public facilitation, public participation, social impact assessment, conflict management, and collaborative planning techniques.

FNRS 440. Forestry Consulting. 3 Hours.
PR: (FMAN 311 or (FNRS 311 and FNRS 311L) and (FMAN 330 or (FNRS 330 and FNRS 330L) or consent. The application of forest management principals and business concepts to the consulting forestry profession. Topics include: natural resource inventories, timberland appraisals, timber sale administration, and forest management planning.

FNRS 445. Bio-based Energy Systems. 3 Hours.
Introduction to biomass feedstock production for bioenergy application, preprocessing and characterization, biofuel conversion technologies, economic and environmental impacts, and greenhouse gas emissions.

FNRS 450. Forest Valuation and Investment. 3 Hours.
PR: FMAN 330 or (FNRS 330 and FNRS 330L). Asset valuation concepts, with special emphasis on forests. Financial analyses of forest operations. Concepts and strategies in forestland investment and portfolio management.

FNRS 454. Field Watershed Hydrology. 3 Hours.
PR: FHYD 444 or FNRS 444. A quantitative understanding of measurement theory, field techniques, instrumentation, and data analysis including technical computational programming used to study hydrologic systems including climate, streams, riparian areas, hill slopes, shallow groundwater, and watersheds.

FNRS 460. Plant Layout for Wood Industries. 3 Hours.
PR: Senior standing. Relates knowledge of wood product processes to optimize production. Study of proper arrangement of machines, and work and storage areas.

FNRS 465. Wood-Based Composite Materials. 3 Hours.
PR: (FNRS 341 and FNRS 341L) or WDSC 341) and Coreq: FNRS 465L. Fundamentals of manufacturing wood-based composite materials, including processing, products, evaluation, and applications in the marketplace.

FNRS 465L. Wood-Based Composite Materials Laboratory. 0 Hours.
PR: Corequisite of FNRS 465. Wood-Based Composite Materials - FNRS 465 Laboratory.

FNRS 470. Problems in Forestry, Wood Science, Wildlife, or Recreation. 1-4 Hours.
PR: Forestry senior or consent.

FNRS 475. Marketing Forest Products. 3 Hours.
This course will examine techniques used by the forest products industry to market commodity, value-added specialty, and sustainable (i.e., green) products.

FNRS 480. Senior Projects 1. 2 Hours.
Senior project requires students to identify manwood science related problem, perform a literature review, and develop a plan for research to be completed in FNRS 481 or WDSC 481.

FNRS 481. Senior Projects 2. 2 Hours.
PR: FNRS 480 or WDSC 480. Senior project requires students to use knowledge from other courses to conduct research proposed in FNRS 480 or WDSC 480 and analyze results and prepare a technical report.

FNRS 485. Environmental Water Resources. 3 Hours.
This course provides background in the physical fundamentals of water resources and interactions of land use practices, environmental water use, and water resources extraction(s) that will equip students with requisite knowledge to address complex contemporary water resources issues.

FNRS 488. Forest Strategic Planning. 3 Hours.
PR: FNRS 362 or FNRS 430 or FNRS 433. This Capstone course covers the principles associated with managing forests for sustained yield, products classification and development, and maintenance and valuation of ecosystems and their services.

FNRS 491. Professional Field Experience. 1-18 Hours.
PR: Consent (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

FNRS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FNRS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

FNRS 496. Senior Thesis. 1-3 Hours.
PR: Consent.

FOR 470A. Problems in Forestry, Wood Science, Wildlife, or Recreation. 1-4 Hours.
PR: Forestry senior or consent.

FRCH 101. Elementary French 1. 3 Hours.
PR: Appropriate score on the Departmental Placement Test or departmental consent. Introduction to the sound and writing systems of the language, with emphasis on listening, speaking, reading, and writing within an authentic cultural context. (Course presumes no prior knowledge of the language.).

FRCH 102. Elementary French 2. 3 Hours.
PR: FRCH 101 or appropriate score on the Departmental Placement Test or departmental consent. Continuation of French 101.

FRCH 203. Intermediate French 1. 3 Hours.
PR: FRCH 100 or FRCH 102 or appropriate score on the Departmental Placement test. This is the third course in the basic French curriculum sequence and prepares students for FRCH 204.

FRCH 204. Intermediate French 2. 3 Hours.
PR: FRCH 203 or appropriate score on the Departmental Placement Test. This is the last course in the basic French curriculum sequence and serves as the foundation for advanced French study. Emphasis on written and oral communication within an authentic cultural context.

FRCH 274. Virtual Vendee. 3 Hours.
PR: FRCH 203 or appropriate score on the Departmental Placement Test. Taught on-line in conjunction with WVU-Vendee. Can count as FRCH 204 or as elective for French major/minor. French culture through podcasts, readings, and writings. Taught in French.

FRCH 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FRCH 301. Language Through Civilization. 3 Hours.
PR: FRCH 200 or FRCH 204 or FRCH 274 or adequate score on the Departmental Placement Test. Development of oral and written communicative skills in the context of the origins, development, and contributions of French and Francophone civilizations.

FRCH 302. Language Through Culture. 3 Hours.
PR: FRCH 200 or FRCH 204 or FRCH 274 or adequate score on the Departmental Placement Test. Development of oral and written communicative skills in the context of contemporary values, institutions and contributions of the French and Francophone world.

FRCH 303. Structure and Communication. 3 Hours.
PR: Frch 200 or FRCH 204 or FRCH 274 or adequate score on the Departmental Placement Test. Development of communicative competencies with emphasis on French language structures, speaking, and writing within an authentic cultural context.

FRCH 304. Advanced Readings. 3 Hours.
PR: FRCH 200 or FRCH 204 or FRCH 274 or adequate score on the Departmental Placement Test. Development of communicative competencies with emphasis on authentic texts and documents from the French- speaking world.

FRCH 370. French Culture in France. 6 Hours.
PR: FRCH 200 or FRCH 204 or adequate score on the placement test. Overview of French language and culture taught on location as part of the faculty-led summer program in France.

FRCH 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FRCH 401. Oral Expression. 3 Hours.
PR: Six hours at the 300-level, including either FRCH 301 or FRCH 302 or consent. Course not open to graduate students. Intensive practice of oral skills with emphasis on discussion, debate, recitation, reading aloud, etc.

FRCH 402. Phonetics and Pronunciation. 3 Hours.
PR: Six hours at the 300-level, including either FRCH 301 or FRCH 302 or consent.

FRCH 413. French Popular Culture. 3 Hours.
This course provides the students with an overview of the specificities and evolution of modern French popular culture through the exploration and analysis of major social movements and cultural artifacts, including short stories, graphic novels and films as well as realia.

FRCH 421. Survey of Literature 1. 3 Hours.
PR: Six hours at the 300-level, including either FRCH 303 or FRCH 304 or consent. Course not open to graduate students. A cultural and historical survey from its beginning to the end of the eighteenth century.

FRCH 422. Survey of Literature 2. 3 Hours.
PR: Six hours at the 300-level, including either FRCH 303 or FRCH 304 or consent. Course not open to graduate students. A cultural and historical survey from the beginning of the nineteenth century to the present.

FRCH 431. French Civilization. 3 Hours.
PR: Six hours at the 300-level, including either FRCH 301 or FRCH 302 or consent. A survey of major themes, movements, ideas, and figures in the development of French civilization from prehistory to the twentieth century.

FRCH 432. Contemporary Culture. 3 Hours.
PR: Six hours at the 300-level, including either FRCH 301 or FRCH 302 or consent.

FRCH 433. Francophone Cultures. 3 Hours.
PR: Six credit hours of FRCH courses at the 300-level. An examination of products, practices, and perspectives characteristic of various cultures of the French-speaking world.

FRCH 450. French Cinema. 3 Hours.
PR: Six hours at the 300-level, including either FRCH 301 or FRCH 302 or consent. Film literacy, vocabulary, and technique in the context of French cinema. Emphasis may vary among origins, poetic realism, surrealism, film noir, nouvelle vague, current movements. May be repeated with permission. Taught in French.

FRCH 461. Commercial French 1. 3 Hours.
PR: Six hours at the 300-level, including either FRCH 301 or FRCH 302 or consent. Development of advanced speaking, reading and writing skills appropriate for business contexts within the French-speaking world.

FRCH 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

FRCH 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

FRCH 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

FRCH 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FRCH 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

FRCH 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

FRCH 496. Senior Thesis. 1-3 Hours.
PR: Consent.

FRCH 498. Honors. 1-3 Hours.
PR: Students in the Honors Program and consent by the honors director. Independent reading, study or research.

GEN 101. Beginner's Guide-Genetics. 3 Hours.
General introduction to concepts in genetics for nonmajors, examining the role of molecules, genes and chromosomes on inheritance, aging, disease, and gender. Case studies show application to agriculture, ecological/environmental issues, medicine, and forensics.

GEN 120. Genetics and Society. 3 Hours.
Origin of life, selection, mutation, eugenics, genetic engineering, genetics and evolution, genetics and medicine, genetics and politics, decision making, social, and ethical issues in human genetics. For students interested in heredity and heritage.

GEN 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

GEN 286. Computational Genetics. 2 Hours.
PR: GEN 101 or BIOL 115 with a minimum grade of C-. Development of computational and bioinformatics skills used in academic, biotech, and pharmaceutical laboratories to analyze and interpret genetic data.

GEN 330. Conservation Genetics. 3 Hours.
PR: BIOL 101 and BIOL 102 or equivalent or higher and MATH 124 or higher. Introduction to the principles of modern genetics needed to understand and manage important challenges in conservation of biodiversity including game, non-game, and endangered/threatened species. Also listed as WMAN 330.

GEN 371. Principles of Genetics. 4 Hours.
PR: (BIOL 101 and BIOL 101L and BIOL 102 and BIOL 102L) or (BIOL 115 and BIOL 117) or BIOL 219 and Coreq: GEN 371L. The fundamentals of inheritance.

GEN 371L. Principles of Genetics Laboratory. 0 Hours.
PR: Corequisite of GEN 371. Principles of Genetics - GEN 371 Laboratory.

GEN 440. Genetic Engineering Technologies. 3 Hours.
PR: GEN 101 or BIOL 115. This course presents agricultural technologies produced by genetic engineering (GE) are available to consumers in the global marketplace and teaches the genetic concepts and manipulations that were used for their production.

GEN 450. Applied Developmental Genetics. 3 Hours.
PR: GEN 101 or BIOL 115. Exploration of current topics in applied developmental genetics through the use of case studies and investigation of underlying concepts that lay at the basis of applied genetics.

GEN 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

GEN 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

GEN 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

GEN 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

GEN 496. Senior Thesis. 1-3 Hours.
PR: Consent.

GEN 497. Research. 1-6 Hours.
Independent research projects.

GEN 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

GEOG 102. World Regions. 3 Hours.
Comparison and relationships of world regions. Geographical perspectives of contemporary global problems. Developing regions contrasted with modernized regions and the consequences of their interactions.

GEOG 107. Global Climate System. 3 Hours.
Introduction to the global climate system, emphasizing change in climates across space and time, and how current climatic changes arise from interactions among the atmosphere, biosphere, hydrosphere, lithosphere, and human societies.

GEOG 107L. Global Climate System Laboratory. 1 Hour.
PR or CONC: GEOG 107. Introduction to global environmental systems operating on the earth's surface, emphasizing weather and climate, soils, natural vegetation, and geomorphology, and examination of human interaction with these natural processes.

GEOG 108. Human Geography. 3 Hours.
This course introduces students to geographic dimensions of important topics in today's world. Students will learn about multiple approaches within human geography, including: cultural, economic, political, and urban geography. Students will use these approaches to understand and think critically about current issues in the world around them, from local to global scales.

GEOG 150. Digital Earth. 3 Hours.
PR or CONC: GEOG 149 or GEOG 150L. Recent advances in technology and data availability have increased our knowledge about the world. This class surveys key concepts of geospatial technologies (GIS, remote sensing, spatial analysis) in the context of social and environmental change.

GEOG 150L. Digital Earth Laboratory. 1 Hour.
PR or CONC: GEOG 150. Introduction to geographic information systems software using basic principles of mapping and analysis of geographic information.

GEOG 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

GEOG 199. Orientation to Geography. 1,2 Hour.
For majors, pre-majors, and potential majors; discussion of the discipline, curriculum requirements, areas of specialization, internships and career opportunities. (1 hr. lec., pass/fail only.).

GEOG 205. Climate and Sustainability. 3 Hours.
Examines the sustainability of natural resources in the context of global climate change. Emphasis is on the sustainability of food, water, energy, and other resources in the United States within the context of the global environment.

GEOG 209. Economic Geography. 3 Hours.
PR: GEOG 108. Examination of the world economy particularly the spatial patterns of agriculture, manufacturing and services.

GEOG 241. Geography of Europe. 3 Hours.
PR: GEOG 108. Study of contemporary human and physical geography of Europe. Insight to political, economic and social dimensions of transition in this region.

GEOG 243. Geography of Africa. 3 Hours.
Systematic and regional characteristics and geographic problems of political, social, and economic development.

GEOG 244. Geography of the Middle East. 3 Hours.
This course is designed to provide students with a detailed understanding and ability to analyze the geography of the Middle East (including North Africa). Special topics on current geographical issues will also be covered.

GEOG 245. Geography of Latin America. 3 Hours.
This course introduced students to geographic approaches to studying the natural, historical, social, political, economic, and cultural issues of Latin America, analyzed from multiple perspectives of how place is created, experienced, and imagined. The course takes a focus on some of the ongoing current events that are dramatically changing the geopolitics of the region, in Cuba, Venezuela, and Puerto Rico.

GEOG 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

GEOG 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent from the honors director. Independent reading, study, or research.

GEOG 300. Geographical Data Analysis. 3 Hours.
Quantitative techniques for collection, classification, and spatial analysis of geographical data with emphasis on map analysis and application of spatial statistics.

GEOG 302. Political Geography. 3 Hours.
Examines the interrelationship between politics and the environment, human territoriality, the political organization of space, geopolitical aspects of the nation-state and international problems.

GEOG 303. Cultural Geography. 3 Hours.
This course engages students in current research in cultural geography. What does a geographic approach contribute to understandings of culture? These perspectives are relevant to analyzing the politics of race, gender, the environment, and our place in it. Cultural geographers critically and creatively explore the ways humans develop a sense of place and their struggles over place and culture.

GEOG 307. Biogeography: Theory and Method. 3 Hours.
PR: GEOG 107. An introduction to the field of biogeography including the study of the distribution and diversity of life, how species migrate, the importance of natural and human disturbances in ecosystems.

GEOG 309. Introduction to International Development. 3 Hours.
Introduction to key concepts of international development including theoretical overview, data visualization, and development planning. Students will participate in lectures, in-class discussions, and computer software training.

GEOG 312. Migration and Human Rights. 3 Hours.
Examines the characteristics and causes of contemporary migration, the geopolitical dimensions of migration control, and the role of human rights in shaping human mobility.

GEOG 333. Human Geography in Practice. 3 Hours.
PR: ENGL 102 and (GEOG 102 or GEOG 108). The theories of science at the ground of human geography and the qualitative methods used to carry out human geographical research.

GEOG 350. Geospatial Problem Solving. 4 Hours.
PR: (RESM 440 or (SUST 250 and SUST 250L) with a minimum grade of C- and Coreq: GEOG 350L. Survey of a variety of spatial analysis techniques used to extract actionable information from geospatial data. Assignments make use of both commercial and open-source software and associated technologies. Students learn to develop, refine, document, and critique multi-part spatial analysis workflows.

GEOG 350L. Geospatial Problem Solving Laboratory. 0 Hours.
PR: Corequisite of GEOG 350. Lab component of Geography 350: Geospatial Problem Solving.

GEOG 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

GEOG 409. Applied International Development. 3 Hours.
PR: GEOG 309. This course will provide students with background and training in international development planning and implementation. It will utilize lessons from real-world development planning scenarios and require students to work in teams to write planning documents using the course lectures and materials.

GEOG 411. Rural and Regional Development. 3 Hours.
PR: GEOG 102 or GEOG 108. An investigation into rural and regional development in developed and underdeveloped regions. The relationship between development theory and policy is explored.

GEOG 412. Geography of Gender. 3 Hours.
PR: GEOG 108 or consent. An exploration of how gender affects spatial patterns and processes. Theoretical and empirical aspects of feminism are analyzed including women and employment, third world feminism, sexuality and space, and gender in academia.

GEOG 415. Global Environmental Change. 3 Hours.
PR: GEOG 107 or equivalent or consent. A geographic analysis of the Earth system emphasizing the interdependence and feedback mechanisms of the hydrologic cycle, ecosystems, climate, and human activities.

GEOG 443. African Environment and Development. 3 Hours.
Detailed examination of the intersection of environmental and development studies in sub-Saharan Africa with critical assessments of current practice.

GEOG 450. Political Ecology Seminar. 3 Hours.
PR: GEOG 300 or GEOG 333 or GEOG 350 or GEOG 455 or GEOG 462 and enrollment in the Geography major or minor. Examination of some of the world's most pressing social-ecological challenges, including the impacts of and responses to climate change and issues of environmental justice. Exploration of foundational texts, core themes and debates, and future trajectories in political ecology through extensive reading, classroom discussion, and written assignments.

GEOG 451. Introduction to GIS Programming. 3 Hours.
PR: GEOG 350 with a minimum grade of C-. Introduction to the computational aspects of geographic information systems and science. Covers topics in programming fundamentals such as variables, control structures, functions, and objects, as well as GIS-specific principles such as spatial data structures, functions for cartography, and creation of tools for GIS software.

GEOG 452. Geographic Information Science: Applications. 3 Hours.
PR: GEOG 350. GIS uses, needs, analysis, design, and implementation. Operational institutional and management topics of GIS for planning, locational decision making in business, government, and research contexts. (2 hr. lec., 1 hr. lab.) (Also listed as GEOL 452.).

GEOG 453. Geographic Information Science: Design and Implementation. 3 Hours.
PR: GEOG 350 and consent. Geographic database design and implementation using contemporary GIS software.

GEOG 454. Environmental Geographic Information Systems. 3 Hours.
Provides background and hands-on experience needed to answer scientific questions about the environment within a raster-based GIS framework. Students should have introductory-level GIS background.

GEOG 455. Introduction to Remote Sensing. 3 Hours.
PR: Corequisite of GEOG 455L. Theory, technology and applications of photo-interpretation and digital image analysis of aerial photography and multispectral images.

GEOG 455L. Introduction to Remote Sensing Laboratory. 0 Hours.
PR: Corequisite of GEOG 455. Introduction to Remote Sensing - GEOG 455 Laboratory.

GEOG 456. Remote Sensing Applications. 3 Hours.
PR: GEOG 455 or consent. Survey of remote sensing applications, focusing on the type of information obtained and methods used.

GEOG 457. Open-Source Spatial Analytics. 3 Hours.
PR: GEOG 300 or GEOG 350. Introduction to the free statistical software tool R and investigation of the use of this software for working with data in general and geographic data in particular.

GEOG 461. Web GIS. 3 Hours.
PR: GEOG 350. The World Wide Web has become a valuable means to display, collect, and share geographic data and maps. This course will explore the use of web technologies for developing web map applications. Students will learn to produce audience appropriate maps in the web environment using a variety of technologies and methods.

GEOG 462. Digital Cartography. 3 Hours.
PR: Consent. Computer-assisted mapping emphasizing the appropriate uses of software in thematic and topographic map design, annotation, symbolization, color, design, display and reproduction.

GEOG 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

GEOG 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

GEOG 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

GEOG 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

GEOG 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

GEOG 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

GEOG 496. Senior Thesis. 3 Hours.
PR: Consent.

GEOG 497. Research. 1-6 Hours.
PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

GEOG 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

GEOG 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

GEOL 101. Planet Earth. 3 Hours.
Composition and structure of the Earth and the physical processes that change Earth's surface.

GEOL 101L. Planet Earth Laboratory. 1 Hour.
PR or CONC: GEOL 101. Laboratory study of the Earth using rocks, minerals and maps.

GEOL 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

GEOL 200. Geology for Environmental Scientists. 4 Hours.
PR: (GEOL 110 and GEOL 111) or (GEOG 110 and GEOG 111) or (GEOL 101 and GEOL 102 and GEOL 103 and GEOL 104). Fundamentals of mineralogy, sedimentation, stratigraphy, petrology, and structural geology needed by environmental scientists to understand earth materials. (Required field trips partial student expense.) (3 hr. lec., 1 hr. lab.).

GEOL 203. Physical Oceanography. 3 Hours.
(Not open to upper division geology majors.) The geography and geology of ocean basins and margins, the chemical and physical properties of sea water, and the examination of the source and location of resources in the sea.

GEOL 225. Planetary Geoscience. 3 Hours.
An examination of the geologic and geochemical processes at work in the solar system from the perspectives supplied by space age exploration of the planets and other solar system bodies.

GEOL 230. Fossils and Evolution. 3 Hours.
PR: GEOL 101 or BIOL 101. Evolutionary history of plants, marine invertebrates, fish, amphibians, reptiles, dinosaurs, birds, and mammals; emphasis on unique contribution of fossil record to evolutionary theory. (2 hr. lec., 1 hr. lab.) (Credit cannot be obtained for both GEOL 103 and GEOL 230.).

GEOL 275. Geologic Field & Computer Methods. 3 Hours.
PR: GEOL 101 and GEOL 102 and GEOL 103 and GEOL 104. Introduction to geologic methods necessary to describe, measure, map, sample, and report on Earth materials in the field and in the laboratory. Develops communication skills necessary to organize and present data as formal, technical reports and presentations. Includes required field trips during class time and on weekends.

GEOL 286. Introduction to Minerals & Rocks. 4 Hours.
PR: GEOL 101 and GEOL 102 with a minimum grade of C- in each and (CHEM 110 or PR or CONC: CHEM 115 and CHEM 115L) and Coreq: GEOL 286L. An introduction to the fundamentals of mineralogy and petrology, focusing on how minerals and rocks form, and how different minerals and rocks are identified, classified, and related to one another through plate tectonic theory and physio-chemical processes. (Required weekend field trip.).

GEOL 286L. Introduction to Minerals & Rocks Laboratory. 0 Hours.
PR: Corequisite of GEOL 286. Introduction to Minerals & Rocks - GEOL 286 Laboratory.

GEOL 293. Special Topics. 1-6 Hours.

GEOL 300. Geology of West Virginia. 3 Hours.
PR: GEOL 103 and GEOL 104. Journey through geologic history of West Virginia with emphasis on the geology of public lands and fossil fuels. Local and overnight field trips are a required part of this course.

GEOL 302. Geology of the National Parks. 3 Hours.
PR: GEOL 103 and GEOL 104. Explore the geology of selected National Parks with emphasis on the plate tectonic setting and in-depth analysis of surface features. One overnight field trip is required as part of this course.

GEOL 311. Stratigraphy and Sedimentation. 4 Hours.
PR: GEOL 103 and (GEOL 103L or GEOL 104) and (GEOL 285 or GEOL 286 and GEOL 286L) and Coreq: GEOL 311L. Study of sediments and sedimentary rocks with an emphasis on the analysis of facies.

GEOL 311L. Stratigraphy and Sedimentation Laboratory. 0 Hours.
PR: Corequisite of GEOL 311. Stratigraphy and Sedimentation - GEOL 311 Laboratory.

GEOL 321. Geomorphology. 3 Hours.
PR: GEOL 101 or GEOG 107 or (SUST 207 and 207L). An examination of earth-surface processes and landforms, with emphasis on environmental geomorphology, streams, floods, glaciers, and landslides.

GEOL 331. Paleontology. 3 Hours.
PR: GEOL 103 and GEOL 104 and STAT 211. Uses of paleontological data in geology; biostratigraphy, paleoecology, evolution, extinction, and biogeography; lab emphasis on identification and utilization of marine invertebrate fossils. (Required weekend field trip at student's expense.).

GEOL 341. Structural Geology. 3 Hours.
PR: GEOL 286 with a minimum grade of C- and PR or CONC: PHYS 101 or PHYS 111 and Coreq: GEOL 341L. Introduction to rock deformation processes and the interpretation of geologic structure, with applications to the structure and tectonic evolution of the Appalachian Mountains. (Several one-day field trips required.).

GEOL 341L. Structural Geology Laboratory. 1 Hour.
PR or CONC: GEOL 341 or GEOL 342. Structural Geology - GEOL 341 Laboratory.

GEOL 342. Structural Geology for Engineers. 3 Hours.
PR: GEOL 101 and PHYS 111. Introduction to rock deformation processes and the development and interpretation of geologic structures. (Several one-day field trips required.).

GEOL 351. Geomathematics. 3 Hours.
PR: GEOL 101 and (MATH 154 or MATH 155). Mathematical methods and applications in geology, geochemistry, geophysics, and environmental science. Review of basic mathematics, differential and integral calculus. Use of computers (Excel) as geological problem-solving tools.

GEOL 365. Environmental Geology. 3 Hours.
PR: SUST 101 and SUST 101L. Principles, practice, and case histories in application of earth science to environmental problems. Includes: water quality; landslides; subsidence; waste disposal; legal aspects; and geological aspects of land-use planning.

GEOL 373. Introduction to Petroleum Geology. 3 Hours.
PR: GEOL 101. Origin, geologic distribution, methods of exploration and exploitation, uses and future reserves of petroleum and natural gas in the world.

GEOL 376L. Research Methods Laboratory. 3 Hours.
PR: GEOL 101 and (GEOL 101L or GEOL 102) and GEOL 103 and (GEOL 103L or GEOL 104). Research Methods is a one-semester, three-hour course in the required WVUteach sequence. It is one of several content courses specially designed to meet the needs of future teachers. WVUTeach students pursuing degrees in Geology or Environmental Geoscience should register for the GEOL section of BIOL/CHEM/GEOL/PHYS 376.

GEOL 386. Igneous and Metamorphic Petrology. 3 Hours.
PR: GEOL 284 or GEOL 286 with a minimum grade of C-. An investigation of the processes that produce igneous, volcanic, and metamorphic rocks on Earth and the terrestrial planets, with special emphasis on how processes fit into the plate tectonic paradigm. Labs will focus on the description and interpretation of igneous and metamorphic rocks in hand specimen and thin sections. (Required weekend field trip.).

GEOL 388. Introduction to Geochemistry. 3 Hours.
PR: GEOL 101 and CHEM 115. This course is an introduction to the big-picture of geochemistry focused on using chemical tools to understand earth processes from the very old to very new, the very small to very large.

GEOL 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

GEOL 400. Environmental Practicum. 1 Hour.
PR: GEOL 200 and PR or CONC: GEOL 331 or GEOL 365 or GEOL 376 or GEOL 411 or GEOL 463 or GEOL 472 or GEOL 486 or GEOG 317 or GEOG 443 or GEOG 454 or GEOG 455 or GEOG 456 or GEOG 461. Capstone Seminar. Students prepare for a career as Environmental Geoscientists; critically reflect on the curriculum in the major; orally present their research projects carried out in the co-requisite. Research-intensive Geology and Geography course.

GEOL 403. Geological Data Analysis. 3 Hours.
PR or CONC: GEOL 311 and GEOL 341 and GEOG 350. Application of geological skills to real-world problems through a series of projects similar to those carried out by geological professionals. Analysis and interpretation of geological datasets using a combination of computer and traditional tools.

GEOL 404. Geology Field Camp. 3-6 Hours.
PR: GEOL 311 and GEOL 341 and consent. Practical experience in detailed geological field procedures and mapping. (Living expense in addition to tuition must be paid at time of registration.).

GEOL 419. Advanced Petroleum Geology. 3 Hours.
PR: GEOL 341 and PR or CONC: GEOL 311. Topics include petroleum source rocks, primary and secondary migration of oil, porosity and permeability development in reservoirs. Focus on the nature of hydrocarbon resources, their importance to civilization, and on the role of the petroleum professional in the industry and society.

GEOL 454. Environmental and Exploration of Geophysics 1. 3 Hours.
PR: PHYS 102 and (MATH 156 or GEOL 351). Basic theory, computer modeling, and use of gravitational, magnetic, resistivity, and electromagnetic methods in the evaluation or shallow targets of interest to environmental, hydrological, and hazardous waste site investigations.

GEOL 460. Physical Volcanology. 3 Hours.
PR: GEOL 286 with a minimum grade C- and (MATH 128 or PR or CONC: MATH 129 or MATH 153 or MATH 154 or MATH 155). An investigation of the physical processes that produce volcanic eruptions and their deposits on Earth and in our solar system. Labs will focus on the description, analysis, and interpretation of rocks and deposits, and geospatial and numerical analysis of volcanological data.

GEOL 462. Introductory Hydrogeology. 3 Hours.
PR: (GEOL 101 and GEOL 102) or (GEOG 110 and GEOG 111) and (MATH 126 and MATH 128) and (CHEM 110 or (CHEM 110A and CHEM 110B) or CHEM 111 or CHEM 115). Basic principles of hydrogeology, emphasizing geologic occurrence of ground water, vadose (soil) water, wells, springs, ground water interaction with streams, and ground-water chemistry, pollution, and pollution restoration.

GEOL 463. Physical Hydrogeology. 3 Hours.
PR: GEOL 101 and MATH 126. Principles of ground-water hydrology, emphasizing the physical occurrence and movement of ground water. Topics include aquifer properties, flow net analysis, and hydraulic aquifer testing.

GEOL 466. Cave and Karst Geology. 3 Hours.
PR: (GEOL 101 and GEOL 102) or (GEOG 110 and GEOG 111) and (CHEM 110 or (CHEM 110A and CHEM 110B) or CHEM 111 or CHEM 115). Study of the nature and origins of cave and karst landforms, terrains, geomorphology, hydrogeology, environmental hazards, and petroleum and mineral ore deposits. (Two required field trips.).

GEOL 469. Applied Hydrogeology Seminar. 1 Hour.
A review of professional practices and opportunities in hydrogeology. Seminar talks by hydrogeological professionals from WVU, industry, and government agencies. Field trips to examine hydrogeological practices and techniques.

GEOL 472. Energy Geology. 3 Hours.
PR: GEOL 101 and GEOL 102 and GEOL 103 and GEOL 104. Energy needs will continue to increase as the human population grows and the quality of life increases for the world. To provide these energy needs, humans draw on a wide portfolio of renewable and nonrenewable energy resources. Examination of the geologic aspects and science of energy and present a balanced view of humanity’s past, present and future energy resource options.

GEOL 479. Log Analysis-Reading the Rocks. 3 Hours.
PR: Consent. The Geosciences require knowledge of the sub-surface properties. Students learn the theory and practice behind a range of subsurface methods. Experience with challenges in geology.

GEOL 484. Minerals and the Environment. 3 Hours.
PR: GEOL 284 or GEOL 200. Study of the importance of minerals in human health and the environment. Includes examples of environmental problems that are caused by minerals and solutions to environmental problems that involve minerals.

GEOL 486. Environmental Isotopes. 3 Hours.
PR: CHEM 111 or CHEM 115. Isotopes are excellent natural tracers and integrators of important environmental, geological and ecological processes. Topics include basic principles of stable isotope geochemistry and their applications in environmental sciences, hydrology, plant/animal ecology, climate reconstruction, and energy.

GEOL 488. Environmental Geochemistry. 3 Hours.
PR: GEOL 351 and CHEM 116. Basic review of physical and aqueous chemistry, discussion of basic geochemical processes; calcium carbonate chemistry, digenetic processes, weathering, the silicate and iron system.

GEOL 489. Junior-Senior Seminar. 1 Hour.
The presentation and discussion of topics regarding graduate school and career preparation for geology majors. Grading will be Pass/Fail.

GEOL 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

GEOL 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

GEOL 492. Directed Study. 1-3 Hours.
Directed study, reading and/or research.

GEOL 493. Special Topics. 6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

GEOL 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

GEOL 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

GEOL 496. Senior Thesis. 1-3 Hours.
PR: Consent.

GEOL 497. Research. 1-6 Hours.
Independent research projects.

GEOL 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

GER 293. Special Topics. 6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

GER 301. Language and Society. 3 Hours.
PR: GER 204 or equivalent. Advanced communication course that focuses on German history from 1800-1950. Students will develop all four language skills and review important grammatical structures.

GER 302. Conversations in Context 2: Germany Today. 3 Hours.
PR: GER 204. Advanced communication course that focuses on current events in Germany. Students will develop all four language skills and review important grammatical structures.

GER 303. Youth Culture in German-Speaking Countries. 3 Hours.
PR: GER 204. Advanced communication course that focuses on the exploration of identity, politics, history, and literature through the stories and experiences of young people in German-speaking cultures.

GER 304. Culture and Science in German-speaking Countries. 3 Hours.
PR: GER 204. Advanced communication course that focuses on inventors and innovations of German-speaking countries, the role of science in the lives of human beings, and the ethical implications of scientific research and advancement on individuals and global societies.

GER 361. German for Professional Purposes. 3 Hours.
PR: GER 204 or Consent. Advanced communication course that explores professional life in Germany. Students will develop practical communication skills while developing a broad understanding of the professional climate in Germany and the role of Germany in commerce and industry.

GER 393. Special Topics. 1-6 Hours.
PR: Consent Investigation of topics not covered in regularly scheduled courses.

GER 401. TurboDeutsch: Intensive German in Review. 3 Hours.
PR: GER 301 or GER 302 or GER 303 or GER 304. TurboDeutsch is an advanced German language course that examines the fundamentals of the German language. Students will review basic structures and learn more complex forms in the language. This structural review will be contextualized through the study of current events in Germany.

GER 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

GER 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

GER 492. Directed Study. 1-3 Hours.
Directed study, reading, and or research.

GER 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

GER 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

GER 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

GER 496. Senior Thesis. 1-3 Hours.
PR: Consent.

GER 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

GERO 212. Introduction to Gerontology. 3 Hours.
Survey of biological, psychological and sociological issues and problems associated with human aging. Selected social policies impacting quality of life for the elderly are presented.

GERO 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

GERO 410. Rural Gerontology. 3 Hours.
Overview of health, social, and policy issues that impact the quality of life of older adults living in rural environments, contrasted with those in urban areas. (Equivalent to GERO 681.).

GERO 412. Public Policy of Aging. 3 Hours.
Policy analysis of major public programs for senior citizens - Older American Act, Medicare-Medicaid and Social Security. Discussion of future of these programs and societal response. Emphasis on senior programs in West Virginia. (Equivalent to GERO 512.).

GERO 418. Aging, Women and Culture. 3 Hours.
This course will use a multidisciplinary approach to examine the impact of gender, race/ethnicity, and culture on aging, the aging population and individual experiences of aging.

GERO 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experimental learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

GERO 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

GERO 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

GSCM 350. Sourcing and Supply Management. 3 Hours.
PR or CONC: BCOR 360 with a minimum of C-. In this course, we will examine the main supply management and strategic sourcing activities, to include the purchasing process and organization of the supply management function, supplier selection and evaluation, negotiation and conflict resolution, ethical and legal issues, cost and price determination, value analysis, global and technological issues pertaining to supply management, among others.

GSCM 355. Logistics and Distribution Management. 3 Hours.
PR or CONC: BCOR 360 with a minimum of C-. The course will focus on both business-to-business and business-to-consumer logistics operations. Activities from the receipt of a customer order to the satisfaction of that order will be covered. These activities include demand management, order receipt, order management, basic warehouse design, layout and operation, inventory management, transportation, returns and reverse logistics, and customer service.

GSCM 360. Supply Chain Analytics. 3 Hours.
PR: GSCM 350 with a grade of C- or better and GSCM 355 with a grade of C- or better. A survey of the broad spectrum of mathematical modeling methodologies available to supply chain analysts for solving supply chain problems.

GSCM 370. Transportation Management. 3 Hours.
PR: GSCM 350 with a grade of C- or better and GSCM 355 with a grade of C- or better. An introductory study of the wide range of issues facing supply chain professionals in transportation. This includes the impact of transportation systems in the economy, regulations, and management of distinct transportation modes with focus on the U.S. domestic transportation systems.

GSCM 425. Supply Chain Network Design. 3 Hours.
PR: GSCM 360 and GSCM 370 with minimum of C- in each. An in-depth study of how to parse supply chain problems into a network design formulation and how to collect appropriate data to use on these models. Students will also learn how to validate, debug, and test the sensitivity of models to various input and model assumptions.

GSCM 430. Supply Chain Technology. 3 Hours.
PR: GSCM 360 with a minimum of C-. Focus on the strategic and operational use of supply chain technologies such as transportation, warehouse, manufacturing, and inventory management systems, along with hardware and other applications. The objective of the class is to provide a strong knowledge and understanding of the technology used in logistics and supply chain management.

GSCM 450. Supply Chain Quality Management. 3 Hours.
PR: (ETEC 350 or GSCM 360) and (ECON 225 or IENG 213 or STAT 211 or STAT 215) with a minimum grade of C- in all. This course presents an overview of Total Quality Management principles and practices. We will discuss quality tools, concepts and processes utilizing real life and current industry examples. Continuous improvement ("lean") concepts will be introduced as they relate to addressing quality issues at the process and product levels. The content will help you prepare for the ASQ Yellow Belt certification exam.

GSCM 455. Project Management. 3 Hours.
PR: BCOR 330 with a minimum grade of C- and PR or CONC: BCOR 360. The focus of the course will be on the process and tools involved in project management. We will also examine the effects of management style on the success of a project, and the use of project management software in planning, directing, and controlling projects.

GSCM 470. Global Supply Chain Systems. 3 Hours.
PR: GSCM 425 and GSCM 450 with a minimum grade of C- in each. As a capstone course, you will be assigned to teams to work with companies in projects to solve their real SCM problems. All the knowledge you've learned about SCM will be utilized in this experiential learning process.

GSCM 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated for a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

GSCM 493. Special Topics. 1-6 Hours.
PR:Consent. Investigation of topics not covered in regularly scheduled courses.

GSCM 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.

HIIM 110. Introduction to U.S. Healthcare Delivery System. 3 Hours.
Overview of Federal, State, and local agencies and their role in the healthcare system. Emphasis on cost, access, quality and types of organizations and services provided.

HIIM 112. Fundamentals of Health Information Management. 3 Hours.
Introduction to the health information management profession and the health record. An overview of the health record, data format, structure, and documentation requirements including accreditation, licensure, regulatory standards and ethical standards of practice.

HIIM 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

HIIM 231. Health Information Management Applications. 2 Hours.
PR: CS 101. A study of Electronic Health Records (EHR) and clinical, financial, and administrative applications. Includes a survey of implementation techniques for collecting, storing, retrieving and managing healthcare data.

HIIM 233. Health Informatics and Information Management Disease Fundamentals and Management. 3 Hours.
PR or CONC: PATH 200 or PALM 200. A study of the nature and cause of disease and management, including qualifications and pharmaceutical interventions relevant to HIIM tasks.

HIIM 235. Coding and Classification of Diseases. 3 Hours.
PR: WVU sections require PR or CONC: ((NBAN 205 or PALM 205) and (NBAN 206 or PALM 206)) with a minimum grade of C- in both, PSC sections require PR or CONC: BIOL 230 with a minimum grade of C-. Basic coding using the latest edition of the International Classification of Diseases. Applications of classifications, taxonomies, nomenclatures, terminologies, and vocabularies to include evaluation and auditing for disease coding.

HIIM 237. Introduction to Professional Practice. 1 Hour.
Exploration of Health Informatics and Health Information Management careers, certifications and requirements, resources, curriculum options, student responsibilities, and opportunities for volunteer service. Observation of practitioners in a variety of facility settings.

HIIM 240. Classification of Healthcare Procedures. 3 Hours.
PR: HIIM 235. Basic coding of healthcare procedures using government approved classification systems and nomenclatures. Applications of classifications, taxonomies, nomenclatures, terminologies, and vocabularies to include evaluation and auditing for procedure coding.

HIIM 242. Healthcare Reimbursement and Revenue Cycle Management. 2 Hours.
A study of systems used for professional and institutional reimbursement in various healthcare settings. Application of revenue cycle principles.

HIIM 244. Principles of Health Informatics and Information Management Quality Management. 2 Hours.
A survey of quality measures, techniques, and theories including utilization review, risk management, patient outcomes, and medical staff credentialing.

HIIM 246. Fundamentals of Clinical Documentation Improvement. 3 Hours.
A study of clinical documentation improvement practices and the management of the clinical documentation process.

HIIM 247. Registries in Healthcare. 2 Hours.
A study of healthcare registry management and the operational components of registries. Registry types and registry policy are included.

HIIM 248. Health Informatics and Information Management Professional Practice 1. 1 Hour.
PR: HIIM 237. Clinical practice experience with a focus on coding and classifications systems, revenue and quality management, clinical documentation improvement and the application and use of technologies associated with these domains.

HIIM 351. Data Privacy, Confidentiality, and Security. 3 Hours.
Fundamentals of consumer privacy, confidentiality, and security. Provides an in-depth study of patient verification and identity management, E-discovery, data security, mobile device security, disaster recovery, and principles related to the release of personal health information.

HIIM 353. Healthcare Information System Analysis and Design. 3 Hours.
Study and evaluation of health information systems and networks. Concepts, techniques, and tools associated with the systems development life cycle, workflow analysis, network design, systems evaluation and maintenance.

HIIM 355. Health Informatics and Information Management Legal Issues. 3 Hours.
Study of the U.S. legal structure and legal theories that apply to health information practice and the electronic record environment. Study and application of the essentials of compliance and fraud surveillance.

HIIM 357. Focus on CPT/HCPCS Taxonomies. 3 Hours.
PR: HIIM 235 and HIIM 240. Advanced in-depth review of the practical application of healthcare taxonomies (CPT) including reimbursement and guidelines. Prepares the student for national coding certificate exam.

HIIM 360. Application of Healthcare Classification Systems. 3 Hours.
PR: HIIM 235 and PR or CONC: HIIM 240. Advanced practical application of healthcare classification systems and taxonomies to include mapping of terminologies across systems such as ICD-10-CM/PCS and CPT.

HIIM 362. Data Governance in Healthcare Systems. 3 Hours.
PR: HIIM 231. Introduction to health information systems with an emphasis on healthcare vocabulary, standards and models, and computer-based patient record. Focus on data governance and data formats to support integration and interoperability.

HIIM 364. Healthcare Data Design. 3 Hours.
PR: HIIM 353. Study of design, development, adoption and application of healthcare databases. Study of database architecture, data dictionary composition, data modeling, data warehouse and visualization.

HIIM 366. Healthcare Analytics 1. 2 Hours.
PR: STAT 111. Introduction to managing healthcare information through data analysis. Concepts of vital statistics; healthcare data collection and presentation; study designs as related to health care organizations and their function.

HIIM 368. Health Informatics & Information Management Professional Practice 2. 1 Hour.
PR: HIIM 248. Clinical practice experience with continuing focus on coding and classifications systems, data privacy and security, clinical documentation improvement and the application and use of technologies associated with these domains.

HIIM 471. Health Informatics & Information Management Research. 3 Hours.
PR: STAT 111 and HIIM 353. An introduction to the application of the scientific method and research design to health informatics and health information management.

HIIM 473. Healthcare Analytics 2. 2 Hours.
PR: HIIM 366. A study of healthcare statistical analytics and decision support applications to facilitate decision making and reporting across the healthcare ecosystem with emphasis on health informatics/information management.

HIIM 475. Project Management in Health Informatics & Information Management. 3 Hours.
In-depth study of successful health information system management including information systems planning, management controls, development, project management, operations and quality improvement, and human resource management.

HIIM 477. Leadership in Health Informatics & Information Management. 3 Hours.
A survey of leadership models and theories. Application of change management principles, strategic and operational management concepts in health systems.

HIIM 479. Coding Professional Practice Experience. 3 Hours.
PR: HIIM 235 and HIIM 240 and HIIM 357 and PR or CONC: HIIM 360. Clinical coding practice experience. Focus on ICD-10-CM/PCS and CPT coding. with a focus on coding and classifications systems, revenue and quality management, clinical documentation improvement and the application and use of technologies associated with these domains.

HIIM 480. Health Informatics & Information Management Administration. 3 Hours.
Financial management and human resource principles applied to the administration of health information systems. Includes a survey of training and development models, workflow and process design.

HIIM 482. Health Informatics and Information Governance. 3 Hours.
PR: HIIM 362. A study of health and consumer informatics with a focus on the electronic exchange of information, information integrity, data quality and application of information governance principles.

HIIM 484. Capstone in Health Informatics & Information Management. 3 Hours.
PR or CONC: HIIM 486. A comprehensive review of health information practices and principles. Includes a capstone essay and presentation. The student will rigorously prepare for the national Registered Health Information Administrator exam.

HIIM 486. Advanced Professional Practice in Health Informatics & Information Management. 3 Hours.
PR: HIIM 368. Professional experience scheduled onsite at a healthcare organization. Provides supervised, structured work experiences. 240 clock hours of clinical/practicum rotation is required.

HIST 101. European History: Antiquity to 1600. 3 Hours.
(HIST 101 does not have to precede HIST 102.) A survey of the major developments in European history beginning with the ancient Mediterranean world and concluding with Reformation Europe.

HIST 102. European History since 1600. 3 Hours.
(HIST 102 may precede HIST 101). A survey of major developments in European history since 1600 with attention to Europe's emerging industrial society and changing role in world affairs.

HIST 104. Latin America: Past and Present. 3 Hours.
Introduction to Latin American history, stressing the relationship between the past and present. Special emphasis is given to economic problems, political development, and social change in modern Latin America.

HIST 105. The Middle East. 3 Hours.
History of the Middle East from the rise of Islam (610 C.E.) to Twentieth Century. Special attention given to religion, gender issues, political developments, economic problems, relations with the West, cultural patterns and changes in the modern era.

HIST 106. East Asia: An Introduction. 3 Hours.
Focuses on modern China, Japan, and Korea. Consideration of important problems facing each nation today together with the cultural and historical developments which help explain contemporary affairs in East Asia.

HIST 109. Introduction to African History. 3 Hours.
Broad and general introductory survey of the history of Africa from the ancient to the modern period. Examines the continent’s history by drawing on case studies from East, Central, North, South, and West Africa. Highlights indigenous initiatives and developments as well as African responses to European contacts through the trans-Atlantic slave trade and colonialism.

HIST 152. Growth of the American Nation to 1865. 3 Hours.
(HIST 152 does not have to precede HIST 153.) Examines the basic political, economic, and social forces in formation and development of the United States before 1865. Emphasis on national development from independence through the Civil War.

HIST 153. Making of Modern America: 1865 to the Present. 3 Hours.
(HIST 153 may precede HIST 152.) Continues the examination of basic political, economic, and social forces in the development of the United States since the Civil War.

HIST 179. World History to 1500. 3 Hours.
Comparative history of Africa, Asia, and Europe from earliest times until 1500. Political, economic, social, and religious developments with emphasis on patterns of authority, the individual, nature, and society.

HIST 180. World History Since 1500. 3 Hours.
Comparative history of Africa, Asia, and Europe 1500 to the present. Political, economic, and social developments with emphasis on patterns of authority, the individual, nature, society, and the impact of the West.

HIST 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

HIST 198. History Fundamentals. 1 Hour.
This course introduces students to the fundamental skills necessary to successfully pursue the study of History. The course focuses on reading historical literature, expressing historical ideas in written and oral forms, note taking, time management, test taking, and study skills.

HIST 199. Orientation to History. 1,2 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities and opportunities.

HIST 201. History of Ancient Times: Stone Age to the Fall of Rome. 3 Hours.
Ancient civilizations of the Near East and the Mediterranean.

HIST 202. History of Modern Legal Thought. 3 Hours.
Surveys the history of modern European and American legal thought focusing on the central problem of jurisprudence, “what is law?” and examines how thinkers have answered the question in the modern period, with a particular emphasis on the nineteenth and twentieth centuries.

HIST 203. Introduction to Medieval Europe. 3 Hours.
Treats the emergence of the distinctive culture of Western Europe from the Fall of Rome to the Renaissance, considering the transformation and interaction of politics, economics, society, religion, and ideas.

HIST 204. Renaissance and Reformation. 3 Hours.
Medieval antecedents; humanism and the new learning; renaissance art; Machiavellian politics; demographic and social trends; Luther and Calvin, Radical reformers, Council of Trent; popular culture; wars of religion.

HIST 205. Absolutism & Enlightenment. 3 Hours.
Europe from 1600-1800. End of religious wars; emergence of absolutism; nobility and court life; mercantilism; expansion; theological and philosophical crisis; empiricism and scientific revolution; philosophes and Enlightenment; French Revolution.

HIST 207. Revolutionary Europe. 3 Hours.
Traces the development of European history from the reign of Louis XV to the end of the Franco-Prussian War. Political and social history emphasized.

HIST 209. Twentieth Century Europe. 3 Hours.
Traces the major political, economic, and social developments of Europe from World War I to the present.

HIST 210. Modern Military History. 3 Hours.
Military history from the American Revolution to the present, stressing the evolution of warfare with particular attention to strategy, tactics, weaponry and the consequences of war.

HIST 211. The Mediterranean 1200-1800. 3 Hours.
Interactions between societies surrounding the Mediterranean (Christians, Muslims, and Jews from Europe, the Ottoman Empire, Egypt, the Maghrib) from the late Abbasids to Napoleon. Trade, warfare, family life, and religion.

HIST 215. History Through Public History Sites. 3 Hours.
Examination of history through the lens of historic places, making use of the methods and tools of public historians.

HIST 217. History of Russia to 1917. 3 Hours.
Medieval Russia and the development of autocracy; imperial expansion and serfdom; response to the West from Peter I to Alexander II; Great reforms, economic transformations, revolutionary movement; complex of crises after 1900.

HIST 218. History of Russia: 1900-Present. 3 Hours.
Revolution and reform to 1914; World War, 1917 revolutions; NEP and Stalinism to 1939; World War II and postwar Stalinism; reform under Khrushchev and Brezhnev; Gorbachev and dissolution of USSR; post-Soviet trauma.

HIST 220. The Holocaust. 3 Hours.
The origins and development of Nazi genocide against European Jews, focusing on the experience of the victims, the motives of the killers, and the inaction of bystanders.

HIST 221. History of Modern Germany. 3 Hours.
Overview of German history emphasizing eighteenth through the twentieth centuries. Special attention focuses on the development of nationalism, state-building, political culture and continuity in German history.

HIST 224. Climate Change: A Global History. 3 Hours.
Interdisciplinary history examination of the causes and consequences of climate change. Students learn about how the Industrial Revolution transformed the relationship of human societies with the environment, and then they draw on this history to consider the ethical and political challenges involved in solving the climate crisis today and in the future.

HIST 225. Gandhi and Beyond: Modern History of South Asia. 3 Hours.
History of India, Pakistan, and Bangladesh from the early modern period to the present; traditional background, Muslim conquests, British Raj, nationalist and independence movements, partitions, independent states, and current issues.

HIST 241. Latin America: Culture, Conquest, Colonization. 3 Hours.
History of the formative period of Latin America, emphasizing the social and economic interaction between Indians, Europeans, and blacks from the conquest to the wars for independence in the early nineteenth century.

HIST 242. Latin America: Reform and Revolution. 3 Hours.
History of modern Latin America, concentrating on the durability of nineteenth-century social, economic, and political institutions, and the twentieth-century reformist and revolutionary attempts to change those institutions.

HIST 250. West Virginia. 3 Hours.
Historical foundations and development of West Virginia, with particular emphasis upon the growth of the government, the economy, and the traditions of the state.

HIST 256. History of the American Revolution: 1763-1790. 3 Hours.
The immediate origins and long-range consequences of the movement for independence from Great Britain; includes the 1775-1790 controversy over the charter of new state and federal governments.

HIST 257. Rise and Fall of the US Republic. 3 Hours.
American history from the Revolution to the Civil War is examined in detail, with particular attention to the key personalities of the era, the development of political parties, the movement westward, the beginnings of industrialization, and the sectional struggles that culminated in war.

HIST 259. The United States: 1865-1918. 3 Hours.
Development of the United States during the most intensive phase of American industrialization; special emphasis on ideas of selected Americans on how to cope with the increase in poverty and social malaise which accompanied economic development; attention is also given to the roots of American imperialism.

HIST 261. Recent America: The United States since 1918. 3 Hours.
(Primarily for non-History majors.) The 1920's, the New Deal, World War II, and a survey of developments since World War II.

HIST 264. American Indian History. 3 Hours.
Surveys the history of Native peoples of what is now the United States, from pre-contact to the present. Ethnohistorical approach emphasizes cultural development as well as interactions with European and American peoples and policies.

HIST 276. Twentieth Century American Foreign Relations. 3 Hours.
A survey of U.S. foreign relations. Topics include security, economic, political and cultural aspects of U.S. foreign relations.

HIST 277. Revolutions in Science and Technology. 3 Hours.
Examines particular periods of intensified change in science and technology, to develop general understanding of scientific and technical change. Episodes may include the Scientific, Industrial, Darwinian, or other revolutions.

HIST 281. Peasants to Agribusiness: History and Problems of Modern Agriculture. 3 Hours.
Surveys the modernization of world agriculture from 17th century Europe to the Green Revolution, and its economic, social, and political consequences. (Alternate years.).

HIST 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HIST 300. Greece and Rome. 3 Hours.
Covers the Minoan and Mycenaean civilizations, Archaic and Classical Greece, Alexander the great and the Hellenistic Age, the Roman Republic, the Etruscan and Carthaginian states, and the rise of the Roman Empire.

HIST 301. The Great Depression. 3 Hours.
Analyzes the causes of the Great Depression in the United States and ways in which it transformed American life, culture, and institutions.

HIST 302. Practicing History. 3 Hours.
Acquisition of the skills necessary to be an effective historian, including critically reading and analyzing primary and secondary sources, learning the basics of historiography, and creating an independent research topic.

HIST 304. History of Sacred Places. 3 Hours.
Begins by analyzing the meaning of sacred and then proceeds to a comparative historical, religious, and political discussion of selected sacred places.

HIST 313. France from 1450 to 1750. 3 Hours.
French history from Charles VII to Louis XV, Italian wars, religious conflict, absolutism, economic and commercial developments, philosophes. Focus on the evolution of national political and cultural unity between the Renaissance and Enlightenment.

HIST 314. France Since 1815. 3 Hours.
French history from the French Revolution to the present. Emphasizes the development of a modern industrial society, nineteenth-century revolutions, the impact of the World Wars, and France's role in new Europe.

HIST 317. German Central Europe, 1648-1900. 3 Hours.
Explores empires, states and nations in Central Europe; it includes the Habsburg Monarchy and Holy Roman Empire following the devastation of 30 years of War, Enlightenment, State- building, Industrialization and Nation-building to the Great War.

HIST 318. Twentieth Century German Central Europe. 3 Hours.
Explores the two World Wars, Holocaust, the Cold War, National Socialist, Communist, and Democratic regimes and Austria as well as the reunification of Germany following Revolutions of 1989.

HIST 319. Myth and Culture in Pre-colonial Africa. 3 Hours.
Pre-colonial history of Africa from its earliest beginning to the mid-nineteenth century. Examines aspects of the diverse social, cultural, economic, and political institutions of pre-colonial Africa, including: the peopling of Africa, interactions between people and their environment, social organization and cultural practices, and traditional and non-traditional belief systems.

HIST 320. Pre-Colonial Africa. 3 Hours.
History of Africa, earliest times to mid-nineteenth century. Focus on population and interaction, state formation, trade in sub-Saharan Africa, and on impact of external influences such as Christianity and Islam.

HIST 321. Colonial Africa and Independence. 3 Hours.
History of Africa from the middle of the nineteenth century to the 1960s. Political and economic trends will form major focus.

HIST 325. Modern China. 3 Hours.
Introduction to modern China (since 1839) with attention to China's Confucian heritage; the Chinese effort to modernize in the face of Western diplomatic and economic pressure; specific attention to China's nationalist and communist revolutionary traditions.

HIST 326. Modern Japan. 3 Hours.
Japan since 1868, development of earlier institutions and ideas, especially Tokugawa Era (1600-1868); nineteenth- and twentieth-century economic change and its social, political and diplomatic implications.

HIST 330. History of Italy, 1200-1800. 3 Hours.
Medieval communes and principalities, humanism and the Renaissance, Habsburg-Valois wars on the peninsula, Baroque and scientific court culture, seventeenth-century crisis, state-building and absolutism, Enlightenment and Napoleonic invasion.

HIST 331. History of Italy since 1800. 3 Hours.
Napoleonic occupation, regional states, Risorgimento, liberal democracy, emigration, industrialization, World War I, Mussolini and Fascism, postwar reconstruction, cinema,, partyocracy, images of Italy, 1900s reforms.

HIST 346. Women, Gender, and Kinship in Premodern Europe. 3 Hours.
Traces key shifts in the theory and practice of European family structure, gender roles, marriage, demography, inheritance, household labor, property holding, and child-rearing from 500BC to 1700.

HIST 348. The International Middle East. 3 Hours.
Overview of both recent Middle Eastern history, and the Middle East's relationship with the rest of the world, and how those interactions changed over time.

HIST 350. The Aztec, Maya, and Inca. 3 Hours.
Survey of political, religious, and social structures of the Aztec, Maya and Inca civilizations; exploring their origins, daily lives, cultural productions, understanding of the universe, and perspectives on Europeans.

HIST 353. 1920s America. 3 Hours.
Analyzes the social, economic, political, and technical changes that transformed life and culture in the United States during the 1920s.

HIST 358. United States Cultural History: 1819-1893. 3 Hours.
Examines the cultural "panics" about identity and sensibility produced by capitalism, slavery, war and urbanization in the nineteenth-century United States.

HIST 360. America in the 1960's. 3 Hours.
Examines the social, cultural, political and economic events and outcomes of the 1960s, including the civil rights movement, political economy, new left, counterculture, Great Society, rights movements, and the conservative ascendancy.

HIST 365. The Vietnam War. 3 Hours.
United States participation in the 1946-1975 fighting in Indochina. United States involvement in the political and military conflict, and the impact of the war on the United States.

HIST 370. Latin America and the World. 3 Hours.
Introduces students to different ways of thinking about Latin America’s relationship with the world and how it has changed over time. Given the United States’ historic impact on Latin America’s relationship with the world, the course focuses on the legacy of intra-hemispheric relations on Latin America alongside Latin America’s impact on the wider world.

HIST 375. Hollywood and History. 3 Hours.
Examines twentieth century American culture, politics, and society through film. It explores the relationship between film and history using films as primary sources for understanding the past.

HIST 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HIST 402. Greece: From Troy to Alexander. 3 Hours.
Formation of Greek civilization, including social and economic factors, culture, interactions with "barbarians," the Persian invasions, the Greek conquest of an Asian empire, citizenship, sex, gender, and warfare.

HIST 403. Rome: From Romulus to Zenobia. 3 Hours.
Formation of Roman civilization, including cultural transformations, conquest of Italy and the Mediterranean, the fall of the Republic, the entertainment and sport industry, the rise of Christianity.

HIST 409. Field Methods in Historic Preservation. 3 Hours.
Outlines professional historic preservation fundamentals associated with inquiry, documentation and analysis. A variety of research approaches expose students to both primary and secondary sources that are typically utilized when conducting reconnaissance or intensive level historic surveys or in preparing HABS/HAER or NRHP documentation.

HIST 412. Introduction to Public History. 3 Hours.
Introduction to a wide range of career possibilities for historians in areas such as archives, historical societies, editing projects, museums, business, libraries, and historic preservation. Lectures, guest speakers, field trips, individual projects.

HIST 414. The Great War, 1914-1918. 3 Hours.
Focuses primarily on the First World War in Europe and the Middle East while mindful of its global contexts and implications. In addition to the diplomatic, political and military history of the war, the course addresses the war on various home fronts and the vast territories that came under Central Power and Allied occupation.

HIST 415. Early Modern Law & Society. 3 Hours.
Examines the ways in which laws and legal practice structured social relations in Europe between the Middle Ages and the French Revolution, focusing on the historical development of legal ideas, the relation of law to political authority and governance, and how various social actors used law to pursue their interests.

HIST 416. The French Wars of Religion. 3 Hours.
Detailed analysis of the tangled roots of this conflict (1562-1629), the salient events of the period, and their long-term impact. Popular culture, military developments, theology, and court politics.

HIST 417. World War II in Europe. 3 Hours.
Impact of World War II on political culture and moral fabric; emphasis on themes of invasion, occupation, collaboration, resistance, survival, and retribution. (Alternate years).

HIST 418. Eastern Europe Since 1945. 3 Hours.
The social, economic, intellectual, cultural, and political history of Eastern Europe since the Second World War. Special emphasis on the causes of the East European revolutions of 1989 and the problems of post-communist transition. (Offered every third semester.).

HIST 419. Revolutionary Russia: 1900-1953. 3 Hours.
Crisis of late Imperial Russia, Silver Age, World War I, 1917 revolutions; Civil War, renewed empire, crisis of 1921; NEP, policy debates, succession; Stalinism to 1939; World War II, post war Stalinism; initial repudiation of Stalin.

HIST 420. USSR and After: 1953 to Present. 3 Hours.
Crisis of late Stalinism; Khrushchev, destalinization, reforms; Brezhnev, stabilization, militarization, corruption, stagnation; Gorbachev, perestroika, glasnost, disintegration; Yeltsin, shock therapy, criminalization, decline.

HIST 421. Hitler and the Third Reich. 3 Hours.
Myths and realities of Hitler's public and personal life; emphasis on rise to power, party, ideology, and propaganda techniques; position and policies as Fuehrer.

HIST 422. Twentieth-Century Germany from Weimar to Bonn. 3 Hours.
The Weimar Republic, the Third Reich, and the two German states created after World War II.

HIST 423. History of Fascism. 3 Hours.
Examines history of fascism in interwar Europe and postwar neo-fascism, using scholarship, art, propaganda, and film. Topics include origins, regime culture, the totalitarian state, and violence.

HIST 424. Britain 1455-1603. 3 Hours.
England from Richard II to Elizabeth I, covering developments in politics, religion and society, ranging from the War of the Roses and the plague to Protestantism and Shakespeare.

HIST 427. East Africa to 1895. 3 Hours.
East Africa from earliest times to the beginning of European control. Population movement and interaction, development of varying types of policy, revolutionary change, and the European scramble for East Africa form the major focus.

HIST 428. East Africa Since 1895. 3 Hours.
History of colonial rule and movement to independence in East Africa. Political, economic, and social changes will be examined with particular emphasis on the rise and triumph of African nationalism.

HIST 430. Living and Dying in Medieval Europe. 3 Hours.
Social and cultural examination of medieval Europe from 500 to 1500. Course themes include diet, relationships, labor, health and the body, material culture, and violence and law.

HIST 432. Eighteenth Century Britain: 1715-1832. 3 Hours.
The "Age of Aristocracy," the political, social, religious, economic, and intellectual impact of the Industrial, Agricultural, American, and French revolutions.

HIST 433. West Africa to 1885. 3 Hours.
West Africa from the earliest times to the imposition of colonial rule. Examines social, economic, political developments and interactions, and European scramble for West Africa. (Alternate years).

HIST 434. West Africa from 1885. 3 Hours.
Abolition of the transatlantic slave trade, imposition of colonial rule, colonial economic, social and administrative systems, the rise and triumph of African nationalism, West Africa since independence.

HIST 435. History of Chinese Thought. 3 Hours.
Explores the inception and development of the major traditions of social and political thought in China. Focuses on how certain political ideas and social practices arose in the Bronze Age and developed and interacted over millennia to inform all areas of life in premodern China.

HIST 437. Africa in World History. 3 Hours.
The course aims to reposition Africa and Africans in world history by recognizing their centrality and contributions to our modern heritage. It explores indigenous developments in Africa and cross-continental interactions between the continent and Asia, the Americas, Europe and Oceania that underscore the role of Africans in shaping their own history and influencing global interdependence.

HIST 439. History of Modern Mexico. 3 Hours.
Focusing on the 19th and 20th centuries, this course explores the peoples and cultures of Mexico from conquest to the present, including Spanish colonial period, Independence wars, early Republic, Mexican-American War, Revolution, Golden Age, and post-NAFTA period.

HIST 440. Mexican Law from Montezuma to El Chapo. 3 Hours.
An examination of the legal history of Mexico since the arrival of Spaniards in the early sixteenth century, exploring development of a Mexican legal culture that blended indigenous conceptions of the law with the Spanish legal framework, derived from both Roman and ecclesiastical traditions.

HIST 441. Seventeenth Century Colonial America. 3 Hours.
The establishment of England's American colonies and their development during a century of political, social, religious, and economic change and the interaction between events in Old and New Worlds. (Alternate years).

HIST 442. Eighteenth Century America. 3 Hours.
The social, political, and economic maturation of England's American colonies, the move toward independence, and the establishment of government at state and federal levels. (Alternate years).

HIST 445. History of American Women. 3 Hours.
Examination of the history of American women from 1607 to the present with emphasis on working conditions, women's rights, development of feminism, women's role in wartime, women in the family.

HIST 450. Slavery and Capitalism in Antebellum America. 3 Hours.
Examines the transatlantic economic system created by American slavery in the decades before the American Civil War, with special emphasis on the experiences of enslaved people and those who profited from enslaved people's labor as well as the cultural debates about the meanings of slavery's relationship to capitalism in this period.

HIST 451. African-American History-1900. 3 Hours.
African background, the slave trade and evolution of slavery in the New World. The attack on slavery and its destruction.

HIST 452. African-American Since 1900. 3 Hours.
Reconstruction, the age of reaction and racism, black migration, black nationalism, blacks in the world wars, and desegregation.

HIST 453. Civil War and Reconstruction. 3 Hours.
Causes as well as constitutional and diplomatic aspects of the Civil War; the role of American black in slavery, in war, and in freedom; and the economic and political aspects of Congressional Reconstruction.

HIST 454. The Coming of the United States Civil War. 3 Hours.
Analyzes social and economic transformations in the early American republic through an examination of the ideological heritage of the Revolution, capitalism, slavery, reform movements, immigration, popular culture, and political conflict before the Civil War.

HIST 456. The Gilded Age in US History. 3 Hours.
Examines responses of the American people and institutions to opportunities and problems of the late nineteenth century. Emphasis on rise of big business; labor organization; immigration; regular, reform, and radical politics; disappearance of the frontier; farm crisis; and origins of imperialism.

HIST 457. The United States from McKinley to the New Deal, 1896 to 1933. 3 Hours.
American national history from William McKinley to Franklin D. Roosevelt. Particular attention is given to great changes in American life after 1896; national political, economic, social, and cultural development; the Progressive Era in American politics; and alterations in American foreign relations resulting from the Spanish-American War and World War I.

HIST 459. United States History: New Deal to Great Society. 3 Hours.
Covers New Deal; World War II; Cold War, with emphasis on American social, political, technological, and cultural developments; United States domestic problems and foreign relations from 1945 to 1968.

HIST 460. World War II in America. 3 Hours.
Examines the American experience in World War II with an emphasis on the economic, social, and political impact of war on American society.

HIST 463. American Foreign Relations to 1941. 3 Hours.
American's foreign policy and involvement in international relations from the eighteenth century to the beginning of World War II.

HIST 464. American Foreign Relations 1941 to Present. 3 Hours.
America's foreign policy and growing involvement in international relations including the U.S. role in World War II, the Korean War and Vietnam.

HIST 468. The Old South. 3 Hours.
(For advanced undergraduate and graduate students.) History of the South exploring peculiar differences that led to an attempt to establish a separate nation. The geographical limitation permits a detailed study of economic and social forces within the context of the larger national history.

HIST 469. The New South. 3 Hours.
Integration of the South into the nation after the Civil War. Emphasis on southern attitudes toward industrialization, commercial agriculture, organized labor, and African-Americans. Special attention to the southern literary renaissance and conservative and progressive politics of the southern people.

HIST 470. United States Civil Rights Movement. 3 Hours.
Examines the recent scholarship, music, film and oral history of the 1950s-60s US Civil Rights Movement, examining its New Deal roots, post-Vietnam War legacies and the nature of American identity, citizenship, and political culture.

HIST 473. Appalachian Regional History. 3 Hours.
Historical survey of Central Appalachia's three phases of development: traditional society of the nineteenth century, the transformation of a mountain society by industrialization at the turn of the twentieth century, and contemporary Appalachia.

HIST 474. The City in American History. 3 Hours.
Examines aspects of urban change in nineteenth-century America, including capitalist transformation, crime, rioting, politics, popular culture, and the social conflict that emerged around efforts to regulate and reform the metropolis and its diverse populations.

HIST 477. Working Class America. 3 Hours.
This course is designed to introduce students to issues surrounding the American working class. It will explore changes in the modes of production, the impact of labor migrations, the emergence of working-class organizations, and the political and social ideologies of working people. Particular attention will be given to the impact of racial, ethnic and gender-based conflict on the emergence of working-class movements. Students will be encouraged to interpret historical material in the context of current workplace relations.

HIST 478. American Immigration History. 3 Hours.
Examines the cycles of immigration to the United states. Emphasis will be placed on the diversity of immigrant groups and their cultures, ethnic community formation, assimilation, immigration policies (especially guest worker and refugee policy), as well as anti-immigrant politics and nativism.

HIST 484. Historical Research-Capstone. 3 Hours.
PR: History major or consent. Capstone course which introduces historical research techniques. Completion and presentation of major research paper required.

HIST 489. Introduction to Historic Preservation. 3 Hours.
Introduction to historic preservation issues, including law, economics, not-for-profit organizations, site interpretation, architectural history, industrial archeology federal programs, downtown revitalization, and landmarks commissions.

HIST 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

HIST 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

HIST 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

HIST 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HIST 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

HIST 495. Independent Study. 1-6 Hours.
HIST 495. Independent Study. 1-6 hr. Faculty supervised study of topics not available through regular course offerings.

HIST 496. Senior Thesis. 1-3 Hours.
PR: Consent.

HIST 497. Research. 1-6 Hours.
Independent research projects.

HIST 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

HIST 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

HLSC 172. First Aid and Emergency Care. 2 Hours.
Introductory course in emergency services aimed at reducing the potential of permanent disability or threats to life, as well as pain, damage, or suffering of less serious nature.

HLSC 270. Introduction To Health Careers. 1 Hour.
A study of careers in the health professions. Readings, lectures, and discussions by professionals in many health fields will include the educational requirements for and functions of their respective health professions. (Pass/fail grading only.).

HN&F 126. Society and Food. 3 Hours.
Exploration on a global basis of interactions of man and environment as reflected in food production systems. Relation of food supply and use in development or maintenance of social and political institutions.

HN&F 171. Introduction to Human Nutrition. 3 Hours.
Nutrient structure, metabolism, integrated function and their importance to human well-being during all stages of the life cycle. Current concerns and those of special interest to college students in meeting nutrient needs.

HN&F 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

HN&F 200. Nutrition/Activity/Health. 3 Hours.
PR: HN&F 171. An overview of how proper nutrition and physical activity relates to individual health and disease prevention.

HN&F 201. Professional Development in Dietetics. 3 Hours.
Introduction to the profession of dietetics with emphasis on competencies, preparation for, and responsibilities associated with the profession.

HN&F 250. Cross-Cultural Cuisine. 3 Hours.
PR: Corequisite of HN&F 250L. This course examines the evolution of human society and culture from a historical perspective as it relates to food and cuisine. Economic and religious influences on dietary patterns and nutritional health are also explored.

HN&F 250L. Cross-Cultural Cuisine Laboratory. 0 Hours.
PR: Corequisite of HN&F 250. Cross-Cultural Cuisine - HN&F 250 Laboratory.

HN&F 271. Fundamentals of Nutrition. 3 Hours.
PR:HN&F 171. The occurrence, uptake and metabolic roles of essential and key non-essential nutrients will be discussed in relation to growth, reproduction, and health in human subjects.

HN&F 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HN&F 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

HN&F 348. Science of Food Preparation. 3 Hours.
PR: (BIOL 101 or BIOL 115) and CHEM 115 and Coreq: HN&F 348L. To explore functional properties of ingredients and applied scientific theories to food preparation.

HN&F 348L. Science of Food Preparation Laboratory. 0 Hours.
PR: (BIOL 101 or BIOL 115) and CHEM 115 and Coreq: HN&F 348. To explore functional properties of ingredients and applied scientific theories to food preparation.

HN&F 353. Food Service Systems Management. 3 Hours.
PR: HN&F 171 and (HN&F 350 or MATH 124 or higher) and Coreq: HN&F 353L. Introduction to food service systems and systems management. Principles of quantity food production management: production schedules, portion control, financial management, layout and equipment planning, evaluation of alternative systems, and computer applications.

HN&F 353L. Food Service Systems Management Laboratory. 0 Hours.
Coreq: HN&F 353. Food Service Systems Management - HN&F 353 Laboratory.

HN&F 355. Nutritional Assessment. 3 Hours.
PR: HN&F 271. This course will provide students with the knowledge needed to interpret nutrition-related lab values and anthropometric data, identify how nutrition is related to disease prevention, understand clinical and biochemical assessments of nutritional status and how nutritional assessment can be applied in dietetics practices.

HN&F 364. Nutrition Education & Counseling. 3 Hours.
PR: HN&F 271. Roles, responsibilities, and limitations of the professional health/nutrition educator in nutrition counseling, guidance and referral, nutrition needs assessment, dynamics of nutrition counseling interaction, and selected counseling techniques.

HN&F 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HN&F 401. Senior Seminar in Nutrition. 2 Hours.
The course provides an integrative approach to various topics related to the practice of dietetics by challenging students to read, critique/evaluate, present, and discuss current research.

HN&F 450. Study Abroad: Food and Culture. 1-6 Hours.
This course examines how food behaviors are shaped by culture, and critically analyzes the multiple relationships between food, culture, and globalization. Students will gain firsthand experience of a culture separate from their own through observations and interactions with the people. Students will be actively involved in the study abroad experience through excursions of various cultural, ecological and archeological importance.

HN&F 460. Advanced Nutrition. 3 Hours.
PR: HN&F 271 and (AGBI 410 or BIOC 339). Role of nutrients in physiological and biochemical processes and metabolism in the body. Biochemical foundations of RDA and clinical nutrition.

HN&F 472. Community Nutrition. 3 Hours.
PR: HN&F 171. Beginning planning for community nutrition to individuals and families at various stages of the life cycle. Roles of concerned agencies and professional groups. Clinical experience in community facilities.

HN&F 473. Medical Nutrition Therapy 1. 3 Hours.
PR: HN&F 171 or consent. Nutrient analysis and introduction to nutrition experimentation; nutritional assessment.

HN&F 474. Medical Nutrition Therapy 2. 3 Hours.
PR: HN&F 473 and (PSIO 241 or PSIO 441 or ANPH 301) or consent. Nutritional care aspects of patients. Modification of diet to meet human nutrition needs in various medical conditions.

HN&F 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

HN&F 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

HN&F 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HN&F 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

HN&F 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

HN&F 496. Senior Thesis. 1-3 Hours.
PR: Consent.

HN&F 497. Research. 1-15 Hours.
PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. Grading may be S/U.

HN&F 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

HONR 101. Honors Hall Council. 1 Hour.
An introduction to the process of planning and implementing community activities. Students produce a proposal, complete with a budget for an activity, which is evaluated by their peers. Students read and discuss articles on Leadership that frame their performance and interactions in an academic context.

HONR 102. Introduction to Honors. 1 Hour.
This course is designed to assist first year Honors students in identifying the knowledge and skills they will need to meet their personal, social, academic, and professional goals as they transition into the Honors College at West Virginia University.

HONR 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

HONR 201. Peer Tutoring. 2 Hours.
PR: Students must be Honors College members in good academic standing. This course is a forum for the exchange of ideas and an environment where tutors learn effective tutoring strategies.

HONR 202. Science and Technology. 3 Hours.
An introduction to the systematic methods of analysis to scientific developments, technological advancements, and our evolving natural world through focused, engaging subjects.

HONR 202A. Science and Technology. 3 Hours.
An introduction to the systematic methods of analysis to scientific developments, technological advancements, and our evolving natural world through focused, engaging subjects.

HONR 202B. Science and Technology. 3 Hours.
An introduction to the systematic methods of analysis to scientific developments, technological advancements, and our evolving natural world through focused, engaging subjects.

HONR 202C. Science and Technology. 3 Hours.
An introduction to the systematic methods of analysis to scientific developments, technological advancements, and our evolving natural world through focused, engaging subjects.

HONR 202D. Science and Technology. 3 Hours.
An introduction to the systematic methods of analysis to scientific developments, technological advancements, and our evolving natural world through focused, engaging subjects.

HONR 203. Honors Mathematics and Quantitative Skills. 3 Hours.
An introduction to mathematics and quantitative techniques and practical application of numerical, symbolic, or spatial concepts through focused, engaging subjects.

HONR 203A. Honors Mathematics and Quantitative Skills. 3 Hours.
An introduction to mathematics and quantitative techniques and practical application of numerical, symbolic, or spatial concepts through focused, engaging subjects.

HONR 204. Society and Connections. 3 Hours.
An introduction to analysis of human behavior, societal and political organization, or communication through focused, engaging subjects.

HONR 204A. Society and Connections. 3 Hours.
An introduction to analysis of human behavior, societal and political organization, or communication through focused, engaging subjects.

HONR 204B. Society and Connections. 3 Hours.
An introduction to analysis of human behavior, societal and political organization, or communication through focused, engaging subjects.

HONR 205. Human Inquiry and the Past. 3 Hours.
An introduction to the humanistic study of historical, philosophical, and spiritual inquiry through focused, engaging subjects.

HONR 205A. Human Inquiry and the Past. 3 Hours.
An introduction to the humanistic study of historical, philosophical, and spiritual inquiry through focused, engaging subjects.

HONR 205B. Human Inquiry and the Past. 3 Hours.
An introduction to the humanistic study of historical, philosophical, and spiritual inquiry through focused, engaging subjects.

HONR 205C. Human Inquiry and the Past. 3 Hours.
An introduction to the humanistic study of historical, philosophical, and spiritual inquiry through focused, engaging subjects.

HONR 205D. Human Inquiry and the Past. 3 Hours.
An introduction to the humanistic study of historical, philosophical, and spiritual inquiry through focused, engaging subjects.

HONR 206. Arts and Creativity. 3 Hours.
An introduction to the study of artistic expression through focused, engaging subjects.

HONR 206A. Arts and Creativity. 3 Hours.
An introduction to the study of artistic expression through focused, engaging subjects.

HONR 206B. Arts and Creativity. 3 Hours.
An introduction to the study of artistic expression through focused, engaging subjects.

HONR 206C. Arts and Creativity. 3 Hours.
An introduction to the study of artistic expression through focused, engaging subjects.

HONR 207. Global Studies and Diversity. 3 Hours.
An introduction to methods and principles of critical inquiry to explore global issues and cultural, linguistic, or experiential diversity through focused, engaging subjects.

HONR 207A. Global Studies and Diversity. 3 Hours.
An introduction to methods and principles of critical inquiry to explore global issues and cultural, linguistic, or experiential diversity through focused, engaging subjects.

HONR 207B. Global Studies and Diversity. 3 Hours.
An introduction to methods and principles of critical inquiry to explore global issues and cultural, linguistic, or experiential diversity through focused, engaging subjects.

HONR 207C. Global Studies and Diversity. 3 Hours.
An introduction to methods and principles of critical inquiry to explore global issues and cultural, linguistic, or experiential diversity through focused, engaging subjects.

HONR 210. City-As-Text-Morgantown. 3 Hours.
National Collegiate Honors Council's framework City-As-Text uses Morgantown as the basis for an interactive course which uses primary document and physical structures to investigate the historical, political, cultural and social aspects of place. The central question that the course seeks to answer is How does a Space become a Place?.

HONR 212. The Salem Witch Trials. 3 Hours.
The Salem Witch Trials are one of the iconic events of American history. In this course students study the trials within their historical, religious, and social contexts, and consider their subsequent interpretation in scholarly works, art, drama, film, poetry, and other media.

HONR 213. Growing Up in America. 3 Hours.
Students in this course explore the how the issues of gender, race/ethnicity, social class, time period, and location shaped cultural understandings of the child and a child's experience as a child throughout American history.

HONR 215. Confronting Pseudoscience. 3 Hours.
Using the tools of evidential reasoning and critical thinking this course examines the difference between a true scientific endeavor and pseudoscientific belief systems.

HONR 219. Future Campus Reads. 1 Hour.
Students in this course will read the five books chosen for the Campus Read Short List. Then, through analysis and discussion, students will make written recommendations to the Provost regarding the benefits and challenges of selecting each book for the Campus Read.

HONR 221. After Foundations. 1 Hour.
PR: Second-Year Honors Students. The course is designed to help second-year Honors students who are about to complete the Honors Foundations program take the skills and knowledge they have gained in the program and create a plan for what comes next.

HONR 245. Service in Tutoring. 2 Hours.
An introduction to the basic principles, practices, and current theory of peer tutoring. This course will provide Honors students the opportunity to tutor in local high schools while learning about topics of interest in education. Students will engage in reflection and critical inquiry that link service learning to academic learning.

HONR 285. Summer Guided Reading. 3 Hours.
Students will explore various reading topics. They will be required to complete assigned readings and submit review papers on the readings.

HONR 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HONR 297. Research. 1-6 Hours.
Independent research projects.

HONR 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

HONR 301. Advanced Peer Tutoring. 1,2 Hour.
PR: Students must be members of the Honors College in good academic standing and have completed HONR 201. (May be repeated for a maximum of 9 credit hours.) This course is designed as a forum for the exchange of ideas and an environment where advanced peer tutors can learn and discuss effective strategies for helping their University peers study various subjects.

HONR 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HONR 397. Introduction to Research 2. 2 Hours.
PR: HONR 297 with a minimum grade of C-. The Introduction to Research 2 is a course required for students enrolled in the second semester of the Research Apprenticeship Program RAP.

HONR 401. Peer Leadership Practicum. 1,2 Hour.
PR: Students must be members of the Honors College in good academic standing and have completed HONR 201 and HONR 301. (May be repeated for a maximum of 9 credit hours. This course is designed as a forum for the exchange of ideas and an environment where advanced peer tutors can learn and discuss effective strategies for helping their University peers study various subjects.

HONR 402. Foundations of Peer Mentoring. 3 Hours.
PR: Students must be in good academic standing with the Honors College to enroll in this course. This course is designed to develop mentors who will lead HONR 199. This course will focus on strategies and tactics used by successful university instructors, practice of these techniques, and the production of materials.

HONR 450. Honors EXCEL Project Development. 1 Hour.
This course will enable and enhance experiential learning for students in the Honors EXCEL program. Students will develop skills in leadership, project management, communication and collaborative scholarship.

HONR 451. Honors EXCEL: Summative Experience. 1 Hour.
This course is designed to enable and enhance experiential learning for students in the Honors EXCEL program. Students will develop written and oral communication skills. Students will present their work to stakeholders on- and/or off-campus.

HONR 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

HONR 491. Professional Field Experience. 1-9 Hours.
PR: Consent. (May be repeated up to a maximum of 9 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

HONR 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HONR 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

HONR 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

HONR 496. Senior Thesis. 1-3 Hours.
PR: Consent.

HONR 497. Research. 1-6 Hours.
Independent research projects.

HONR 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

HONR 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

HORT 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

HORT 220. General Horticulture. 3 Hours.
PR: BIOL 101 and (BIOL 101L or BIOL 103) or consent and Coreq: HORT 220L. Principles underlying present-day horticulture practice with special emphasis on how basic discoveries in plant science have been applied in horticulture.

HORT 220L. General Horticulture Laboratory. 0 Hours.
Coreq: HORT 220. General Horticulture - HORT 220 Laboratory.

HORT 251. Floral Design. 3 Hours.
Basic course in flower arrangement to cover occasions for the home and retail flower shop.

HORT 260L. Woody Plant Materials Laboratory. 3 Hours.
Common ornamental woody plants, their identification, cultural needs, and evaluation of use; some outdoor study and a one-day nursery trip.

HORT 262. Herbaceous Plant Materials. 3 Hours.
PR: Corequisite of HORT 262L. Identification, description, adaptability, and evaluation of selected herbaceous annuals and perennials with emphasis on their use as design elements.

HORT 262L. Herbaceous Plant Materials Laboratory. 0 Hours.
Coreq: HORT 262. Herbaceous Plant Materials - HORT 262 Laboratory.

HORT 293. Special Topics. 6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HORT 298. Honors. 1-3 Hours.
Independent reading, study, or research.

HORT 310. Vines to Wines. 3 Hours.
PR: Corequisite of HORT 310L. Introduction and overview of the principles underlying present-day grape and wine production with special emphasis on origins, botany, appreciation, historical and cultural significance.

HORT 310L. Vines to Wines Laboratory. 0 Hours.
PR: Corequisite of HORT 310. Laboratory for HORT 310.

HORT 315. Seed to Weed: Unpotting the Plant. 3 Hours.
This course encourages discussion and discourse on the cultivation and uses of cannabis by exposing students to the history, laws and regulation, health effects, environmental issues, growing and marketing of cannabis and cannabis products.

HORT 330. Plant Propagation. 3 Hours.
PR: (PLSC 206 or consent) and Coreq: HORT 330L. Study of practices of plant propagation and factors involved in reproduction in plants.

HORT 330L. Plant Propagation Laboratory. 0 Hours.
Coreq: HORT 330. Plant Propagation - HORT 330 Laboratory.

HORT 360. Landscape Management. 3 Hours.
PR: (HORT 220 and HORT 260 and HORT 262 and Coreq: HORT 360L) or consent. Introduction to basic landscape management principles and practices including landscape design, installation and maintenance.

HORT 360L. Landscape Management Laboratory. 0 Hours.
PR: HORT 220 and HORT 260 and HORT 262 and Coreq: HORT 360. Laboratory for HORT 360.

HORT 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HORT 441. Garden Center Management. 3 Hours.
PR: PLSC 206 and HORT 220 or consent. Principles of the operation and management of nursery, garden center, and landscape installation businesses with an emphasis on current issues.

HORT 443. Fruit & Vegetable Crops. 3 Hours.
PR: Corequisite of HORT 443L. Botanical and ecological characteristics influencing the production of fruit and vegetable crops. Course emphasis is on traditional and contemporary commercial production methods.

HORT 443L. Vegetable Crops Laboratory. 0 Hours.
PR: Corequisite of HORT 443. Fruit & Vegetable Crops - HORT 443 Laboratory.

HORT 444. Handling and Storage of Horticultural Crops. 3 Hours.
PR: PLSC 206 and Coreq: HORT 444L. Characteristics of perishable crops. Methods and materials used to maintain quality.

HORT 444L. Handling and Storage of Horticultural Crops Laboratory. 0 Hours.
Coreq: HORT 444. Handling and Storage of Horticultural Crops - HORT 444 Laboratory.

HORT 445. Greenhouse Management. 3 Hours.
PR: HORT 220 with a minimum grade of C- and Coreq: HORT 445L. Greenhouse as a controlled plant environment. How to regulate factors influencing plant growth and development within specialized environments of greenhouses.

HORT 445L. Greenhouse Management Laboratory. 0 Hours.
Coreq: HORT 445. Greenhouse Management - HORT 445 Laboratory.

HORT 480. Case Studies in Horticulture. 3 Hours.
PR: Consent. Capstone course for the horticulture major. The main goal of the course is to develop independent thinkers and professionals in the field of horticulture. The course emphasizes data and information gathering, vetting of sources and resources used in problem solving, and the formation of concise and logical arguments to help analyze and solve from simple to complex problems.

HORT 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

HORT 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

HORT 493. Special Topics. 6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HORT 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

HORT 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

HORT 496. Senior Thesis. 1-3 Hours.
PR: Consent.

HORT 497. Research. 1-6 Hours.
Independent research projects.

HORT 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

HRMG 200. Diversity and Inclusion Management. 3 Hours.
The purpose of this course is to introduce students to modern theories and paradigms related to diversity in the workplace. Students will explore the benefits and barriers to creating a diverse organization. Finally, students will learn how to implement strategies to be more interpersonally inclusive as well as develop their inclusive leadership skills.

HRMG 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HRMG 440. Training and Development. 3 Hours.
PR: MANG 330 with a minimum grade of C-. This course provides a theoretical and practical understanding of the field of training and development and offers some practical approaches to conducting training programs.

HRMG 450. Talent Acquisition & Performance Management. 3 Hours.
This course explores the core principles and practices of talent acquisition and performance management. It focuses on how organizations attract, recruit, and select the best talent, and how they manage and optimize employee performance to align with organizational goals.

HRMG 455. AI Applications in HRM. 3 Hours.
This course provides an overview of key concepts and techniques in machine learning that form the basis of contemporary artificial intelligence (AI) tools. The focus of this course is on applications of AI in various functions of human resource management (HRM). It also discusses emerging issues related to ethical, legal, and organizational challenges in applying AI to HRM activities.

HRMG 460. Compensation and Benefits. 3 Hours.
PR: MANG 330 with a minimum grade of C-. Designing and implementing total compensation systems in both private and public sectors. The emerging elements of total compensation systems are included, providing insights into problems and opportunities for personnel.

HRMG 470. Conflict Management. 3 Hours.
This course focuses on the management of conflict in an organizational setting. The topics covered include foundations of individual behavior, styles for managing conflict, negotiations, mediation, and arbitration.

HRMG 480. Employee and Labor Relations. 3 Hours.
This course provides a comprehensive overview of employment law and labor relations, exploring the legal rights and responsibilities that govern employer-employee relationships and examining the processes and challenges involved in collective bargaining, labor unions, and workplace conflict resolution.

HRMG 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated for a maximum of 18 hours.) Prearranged Experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise fro professional competence development.

HRMG 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course Offerings.

HTOR 276. The Hospitality of Outdoor Recreation and Adventure-Based Tourism. 3 Hours.
This course provides a comprehensive overview of tourism and outdoor recreation management with a national and global focus. Students will explore key trends and challenges in the industry, such as remote work tourism, the influence of digital marketing, luxury and niche travel markets, and the economic impacts of seasonal recreation.

HTOR 376. Hospitality & Tourism Leadership. 3 Hours.
The primary objective of this course is to provide a basic understanding of the lodging, food service, and tourism industries by tracing the growth and development of each industry. The focus is on management and leadership in these industries.

HTOR 380. Hospitality Business, Innovation, and Technology. 3 Hours.
PR: HTOR 376 is recommended but not required. This course focuses on the framework of hospitality businesses and how they enhance the tourism brand of the destination. Students will explore current innovations and new strategies of innovation, entrepreneurship opportunities, and technology needs to solve current and future problems of the hospitality and tourism industry.

HTOR 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HTOR 470. Tourism Management. 3 Hours.
PR or CONC: HTOR 376. This course provides a basic understanding of the organizational characteristics of tourism: structures, operations, and social/cultural aspects. International, national, regional and state/local tourism organizations are examined.

HTOR 471. Restaurant Management. 3 Hours.
PR or CONC: HTOR 376 with a minimum grade of C-. The primary objective of this course is to provide knowledge to lead a restaurant or food and beverage management operation.

HTOR 472. Hotel Operations Management. 3 Hours.
PR or CONC: HTOR 376 with a minimum grade of C-. The primary objective of this course focuses on operational, financial and maintenance procedures for Hotel Management. In-class activities, industry professionals, and experiential assignments introduce students to the day-to-day operations of each department in a hotel and allow students to understand what seasoned managers do.

HTOR 473. Hospitality Social Customer Relationship Management. 3 Hours.
PR: HTOR 376 with a minimum grade of C-. This course focuses on identifying hospitality industry best practices in building and managing a customer base through social media channels. Students will develop innovative engagement strategies to achieve the goals of social customer relationship management.

HTOR 474. Hospitality Revenue Management. 3 Hours.
PR: HTOR 376 with a minimum grade of C-. This course explores the important role of revenue management in the hospitality industry. It also instructs future hospitality managers how to effectively manage their inventories and prices through revenue management principles and theories.

HTOR 480. Event Planning Practicum. 3 Hours.
PR: HTOR 376 and PR or CONC: (HTOR 471 or HTOR 472) with a minimum grade of C- in each. This course will utilize experiential learning to prepare students to plan and execute special events in the hospitality industry.

HTOR 491. Professional Field Experience. 1-18 Hours.
PR: Consent (may be repeated up to a maximum of 18 hours). Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

HTOR 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

HUM 101. Introduction to Western Civilization 1. 3 Hours.
Presents the high points of Greco-Roman and Medieval European civilizations: their art, architecture, philosophy, religion, literature and music.

HUM 102. Introduction to Western Civilization 2. 3 Hours.
Presents the art, architecture, philosophy, religion, literature and music of the following periods in Western civilization: the Renaissance, the Age of Classicism and the revolutionary nineteenth and twentieth centuries.

HUM 106. Promethean Myth, Modern Arts. 3 Hours.
Introduces theme of Promethean individuality at the limits of humanistic pursuit, surveys archetypal characters as they have developed to the present, considering how skepticism had inspired art in diverse forms.

HUM 107. The Humanities of Egypt. 3 Hours.
This course will focus on the cultural history of Egypt from ancient until modern times.

HUM 109. The Italian Renaissance. 3 Hours.
Introduction to artistic and cultural developments during the Renaissance. In addition, the class will appreciate cross-cultural influences and examine the impact that the Renaissance had on Nineteenth-Century writers.

HUM 112. Humanities of Greece. 3 Hours.
Presents the art, architecture, philosophy, religion, literature, and history of Greece.

HUM 113. Faculty Led Travel: Greece. 1 Hour.
Learn about the art, architecture, philosophy, religion, literature, and history of Greece, through faculty led travel.

HUM 231. Greek and Roman Civilization and Culture. 3 Hours.
Examination of the numerous ways in which Greek and Roman cultures intersected, coincided, and at times collided. The relationship has no parallel in world history in that their contact created a unique fusion of cultural expression identified as “Greco-Roman.”.

HUM 232. Greek and Roman Myths. 3 Hours.
Introduction to the primary characters and most important stories of classical Greek and Roman mythology, with examination of key aspects of history and culture, including art, literature, philosophy, and religion.

HUM 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HUM 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

HUM 492. Directed Study. 1-3 Hours.
Directed study, reading and/or research.

HUM 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HUM 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

HUM 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

HUM 499. Global Service Learning. 1-3 Hours.
PR: Consent Theory and practice of global service learning. The main objective will be to pair the experimental aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

HWB 110. Pathways in Health and Well-Being. 3 Hours.
This course provides a foundational understanding of the health and well-being industry, exploring its key sectors, challenges, and evolving trends. Students will develop essential skills such as communication, teamwork, problem-solving, adaptability, and ethical decision-making, which are crucial for navigating this dynamic field. Through discussions, reflections, and insights from industry professionals, students will examine various roles & responsibilities within the profession.

HWB 224. Enhancing Health and Well-being. 3 Hours.
Gain knowledge and explore links among the eight dimensions of wellness: physical, mental, social, spiritual, intellectual, environmental, occupational, and financial.

HWB 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

HWB 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study,.

HWB 321. Therapeutic Modalities. 3 Hours.
PR: Consent. Designed to investigate tissue repair, physiology of hot and cold treatment, therapeutic modalities and pharmacology relevant to athletic injury management.

HWB 322. Orthopedic Assessment 1. 3 Hours.
PR: Consent. Designed to provide in-depth analysis of athletic injury mechanisms to the lower extremity; injury recognition, injury evaluation techniques, and muscle isolation techniques.

HWB 339. Professional Immersion in Health and Well-being. 3 Hours.
This course will provide prospective healthcare professionals with an immersive experience within the health and well-being field based on their specific academic and professional goals. To supplement the experiential learning outside of the classroom, students will spend classroom time exploring critical topics related to professional development and career exploration related to the health and well-being profession.

HWB 359. Mindfulness for Health and Well-being. 3 Hours.
This upper-level 3-credit class is designed to give students a primary understanding of stress, anxiety, anger, mindfulness, and other related positive psychology issues. Other components of the class will include exploration of the history of the field of mental health and current trends in mental health professions.

HWB 373. Fitness Management. 3 Hours.
Provide content knowledge and practical experiences in health and fitness facility management and operation. ACE certification exam prep.

HWB 374. Fitness Field Testing. 3 Hours.
Provide content knowledge and practical experience concerned with health screening, fitness testing, assessment and evaluation. Content needed for ACE national certification exam.

HWB 375. Methods of Health Coaching. 3 Hours.
Gain knowledge and skills to assess a client's lifestyle behaviors and support them through behavior change. Health Coaches actively collaborate with clients, assisting them in unlocking their full potential to live healthy lifestyles. ACE Health Coach Certification exam.

HWB 404. Enhancing Community Well-being. 3 Hours.
Using concepts, theories and methods of community organizing, health advocacy and communication to promote community well-being.

HWB 470. Methods of Group Fitness. 3 Hours.
Provide practical experiences in teaching group fitness exercises, including hi/lo, step, interval, and resistance training. ACE certification exam prep.

HWB 472. Methods of Personal Training. 3 Hours.
Content knowledge, practical experiences of training techniques and exercise programming for the healthy adult and special populations. ACE certification exam prep.

HWB 476. Fitness Internship. 3-6 Hours.
Supervised experience in a health/fitness environment under the direction of a professional at the site. Preparation for the ACE national certification exam.

HWB 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ID 105. Introduction to Interior Architecture. 3 Hours.
PR: Consent. Introduction to the practices and theories of interior architecture and design within and across cultures.

ID 115S. Introduction to Architectural Design and Graphics Studio. 4 Hours.
PR: Consent. Introduction to the principles and elements of design and their applications in analyzing, interpreting, developing, and communicating architectural spaces.

ID 165S. Architecture and Design Foundations Studio. 4 Hours.
PR: ID 105 and (ID 115 or ID 115S) with a minimum grade of C- in each. Introduction to architectural design and communication processes utilizing concept development and the principles and elements of design.

ID 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

ID 205. Introduction to Architectural Building Technologies. 3 Hours.
PR: ID 105 and ID 115 and ID 165 with a minimum grade of C- in each. Introductory overview of building technologies associated with structure, enclosure, and the interior environment (including partition, lighting, acoustics, thermal comfort, and indoor air quality).

ID 215S. Architectural Interior Design and Graphics 1 Studio. 6 Hours.
PR: ID 105 and (ID 115 or ID 115S) and (ID 165 or ID 165S) with a minimum grade of C- in each. Introduction to architectural design abstraction and conceptualization; Emphasis is placed on developing understandings and applications of ordering principles, pattern utilization, figure-ground relationships, and color in the development of architectural environments. Development of drawing (hand and digital) as a means to design is stressed.

ID 250. History of the Architectural Interior 1. 3 Hours.
PR: Consent. Examination of the architectural interiors of classical antiquity and the medieval periods within their geographical, political, aesthetic, social, technological, and economic contexts. Content is focused on developments within Europe and the Mediterranean basin.

ID 260. History of Interiors and Furniture 2. 3 Hours.
PR: ID 230. Interiors, furniture, and decorative arts of Europe and America in the nineteenth and twentieth centuries.

ID 265S. Architectural Interior Design and Graphics 2 Studio. 6 Hours.
PR: (ID 215 or ID 215S) with a minimum grade of C-. Introduction to the design of architectural, typological elements and compositions with an emphasis on spatial development and human accommodation. Students examine precedents by significant architects and designers and use their findings to inform design decisions. Design diagramming, modeling (digital and physical), and graphic communication are stressed.

ID 280. History of the Architectural Interior 2. 3 Hours.
PR: Major or Permission. Examination of the architectural interiors of the modern period within their geographical, political, aesthetic, social, technological, and economic contexts. Content is focused on European and American developments within an increasingly globalized world.

ID 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ID 305. Architectural Interior Building Systems and Construction. 3 Hours.
PR: ID 205 with a minimum grade of C- or consent. In depth survey of the properties of interior construction materials and systems with an emphasis on understanding their financial, environmental, regulatory, and craft characteristics and implications for design decision-making.

ID 310. Interior Finishes, Furnishings, and Fixtures. 3 Hours.
PR: ID 205 with a minimum grade of C-. In-depth survey of the properties of interior finishes, furnishings, and fixtures with an emphasis on understanding their financial, environmental, acoustical, ergonomic, maintenance and/or regulatory characteristics and implications for design decision-making.

ID 315S. Advanced Architectural Interior Design 1 Studio. 4 Hours.
PR: (ID 265 or ID 265S) with a minimum grade of C- and PR or CONC: (ID 316 or ID 316S) and consent. Application of orderly design processes to residential building programs. Investigation of the relationship between human factors and the interior environment. Analysis and integration of existing site considerations, space planning and universal design principles, and building regulations in the development of cohesive residential interior environments. Introduction to design integration of residential interior finishes, furnishings, and fixtures.

ID 316S. Advanced Architectural Graphics 1 Studio. 2 Hours.
PR: Consent. Development of advanced speaking and graphic layout skills for design presentations.

ID 335. Light & Color in Architectural Interiors. 3 Hours.
PR: Consent. Introduction to the theories and practices of lighting design with an emphasis on the relationships between light, color, and well-being within architectural interiors. Overview of the principles of light quality, quantity, distribution, and color rendering for residential and contract spaces. Application of lighting calculations, modeling, and graphic illustrations to the development of interior lighting schemes.

ID 365S. Advanced Architectural Interior Design 2 Studio. 4 Hours.
PR: (ID 315 or ID 315S) with a minimum grade of C- and PR or CONC: (ID 366 or ID 366S). Application of orderly design processes to small scale commercial building programs. Continuing analysis and integration of existing site considerations, space planning and universal design principles, and building regulations in the development of cohesive commercial interior environments. Introduction to selection and specification of commercial interior finishes, furnishings, and fixtures applied to commercial design projects.

ID 366S. Advanced Architectural Graphics 2 Studio. 2 Hours.
PR: Consent. Development of advanced graphic and specification skills in architectural interior construction documentation.

ID 400. Interior Design Internship. 3-6 Hours.
PR: ID 375 and consent. Supervised, direct experience with a practicing designer or other closely allied professional in a career environment.

ID 415S. Advanced Architectural Interior Design 3 Studio. 6 Hours.
PR: (ID 316 or ID 316S) and (ID 365 or ID 365S) and (ID 366 or ID 366S) with a minimum grade of C- in each or consent. Application of orderly design processes, including community-engaged and/or integrated design collaborations, to commercial interior design projects; Investigation of relationship between human factors and commercial interior environments; Continued analysis and integration of existing site considerations, space planning, universal design principles, and building regulations in the development of cohesively designed commercial interiors; Selection and specification of commercial interior finishes, furnishings, and fixtures.

ID 425. Professional Practices in Architectural Interior Design. 3 Hours.
PR: Consent. Survey of financial, regulatory, and ethical parameters and issues associated with interior design practice and project management within globalized societies.

ID 450. Interior Design Seminar. 1 Hour.
PR: ID 420. Professionals in interior design discuss professional organizations, ethics, entry-level positions, and business practices.

ID 465S. Advanced Architectural Interior Design 4 Studio. 6 Hours.
PR: (ID 415 or ID 415S) with a minimum grade of C- or consent. Demonstration, in the design of an architectural interior, abilities to independently conduct design research; identify, analyze, and integrate theoretical and practical knowledge; and reflect on the ethical issues implicit in the project; The project is comprised of visual, oral, and written components and is selected and developed by the student with consultation and approval of the course instructor.

ID 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ID 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours). Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ID 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ID 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ID 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ID 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ID 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

IDT 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

IDT 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

IDT 430. Women in International Development. 3 Hours.
To examine the cultural diversities in the definition of women's roles and status, to investigate women's access to education, health, income, credit and technology, and to study women's health, income, credit and technology, and to study women's contributions in third-world development.

IDT 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

IDT 497. Research. 1-6 Hours.
Independent research projects.

IENG 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

IENG 200. Fundamentals of Industrial Engineering. 1 Hour.
PR: Sophomore standing. An introduction to the basic principles of industrial engineering.

IENG 213. Engineering Statistics. 3 Hours.
PR or CONC: MATH 156. The use of basic statistical analysis in engineering decision making, including common statistical distributions encountered in engineering, test of hypotheses, confidence intervals, and introduction to simple linear regression.

IENG 220. Re-Engineering Management Systems. 2 Hours.
PR or CONC: IENG 220L and Sophomore standing. Principles and techniques associated with system, job and task re-engineering. Work measurement systems, work flow analysis and time study techniques. Introduction to factors influencing people machine.

IENG 220L. Re-Engineering Management Systems Laboratory. 1 Hour.
PR or CONC: IENG 220 and Sophomore standing. Laboratory for IENG 220.

IENG 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

IENG 301. Materials and Costing. 3 Hours.
PR: IENG 377 and MAE 241 and MATH 156 with a minimum grade of C-. Utilize a problem-based approach to materials selection considering material properties, mechanical properties, design requirements, and economic considerations in the selection of materials and manufacturing processes.

IENG 302. Manufacturing Processes. 2 Hours.
PR or CONC: IENG 301 or MAE 343 or MAE 353. Lectures, videos and examples relating to materials, mechanical properties, processing parameters, design, equipment, economics, failure analysis, and processing systems emphasizing casting, powder processing, machining, joining and forming operations.

IENG 302L. Manufacturing Processes Laboratory. 1 Hour.
PR or CONC: IENG 302. Laboratory experiments and demonstrations of the basic manufacturing operations of casting, machining and joining. Process parameter measurement, inspection techniques and CNC programming are performed and laboratory report writing is emphasized.

IENG 305. Introduction to Systems Engineering. 3 Hours.
PR: IENG 213 and IENG 377. This course focuses on systems engineering and analysis. It covers the development and implementation of systems, and their continuous improvement.

IENG 314. Advanced Analysis of Engineering Data. 3 Hours.
PR:IENG 213. Introduction to linear statistical models. Design and analysis of simple experimental configurations occurring frequently in engineering studies. Similarities and differences between regression and experiment design models emphasized in a vector-matrix setting.

IENG 316. Industrial Quality Control. 3 Hours.
PR: IENG 213. Principles and methods for controlling the quality of manufactured products, with emphasis on both economic and statistical aspects of product acceptance and process control.

IENG 331. Computer Applications in Industrial Engineering. 3 Hours.
PR: ENGR 102. Introduction to computer applications in manufacturing. Emphasis on system design and analysis and the role of computers in productivity improvement.

IENG 343. Production Planning and Control. 3 Hours.
PR: IENG 213 and IENG 220 and IENG 220L. Principles and problems in forecasting, aggregate planning, material management, scheduling, routing, and line balancing.

IENG 350. Introduction to Operations Research. 3 Hours.
PR:IENG 213. An introduction to the basic principles and techniques of operations research. Topics include linear programming, integer programming, transportation and assignment problems, project scheduling, queuing theory, and computer applications.

IENG 360. Human Factors Engineering. 3 Hours.
PR: IENG 213. Includes the study of ambient environment, human capabilities and equipment design. Systems design for the human-machine environment interfaces will be studied with emphasis on health, safety, and productivity.

IENG 377. Engineering Economy. 3 Hours.
Basic concepts of financial analysis, investment planning and cost controls as they apply to management technology investment in manufacturing; financial planning and budgeting as applied to an engineering function.

IENG 385. Sales Engineering 1. 3 Hours.
This course introduces students to the foundational concepts and skills required for success in a sales engineering role.

IENG 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

IENG 403. Additive Manufacturing Technology & Materials. 3 Hours.
PR: IENG 302 and IENG 302L with a minimum grade of C- in each. This course provides detailed principles, engineering design, theories, materials and applications to advanced additive manufacturing (AM) processes-extrusion, material jetting, photopolymerization, powder bed fusion, binder jetting, sheet lamination, direct energy deposition and the latest state of the art. The impacts of AM on economy, environment and society will be also explored. Project-based assignment will be given to provide students hands-on experience.

IENG 404. Engineering Leadership. 3 Hours.
PR: IENG 220. This course is designed to prepare students as future leaders of engineering project teams.

IENG 405. Design for Manufacturability. 3 Hours.
PR: IENG 302 and IENG 302L with a minimum grade of C- in each. Aspects of design, manufacturing and materials; emphasis on design for manufacturability and assembly, including material selection and manufacturing processes on product cost.

IENG 406. Lean Six Sigma. 3 Hours.
PR: IENG 316 with a minimum grade of C-. This course introduces students to the concepts, tools, and techniques used in applying Lean Six Sigma (LSS) for process improvement, including lean culture, DMAIC steps, and team formation dynamics. Students will gain knowledge in the application of lean six sigma from a managerial perspective, enabling them to lead and execute continuous improvement activities in manufacturing and service settings.

IENG 411. Analytics for Decision Making. 3 Hours.
PR: IENG 314 with a minimum grade of C-. This course introduces how data is used to optimize the operational and financial performance of an organization, including selecting the best data for analysis, utilizing the most applicable tools and methods, and presenting the results in an effective format.

IENG 413. Smart Manufacturing. 3 Hours.
PR: ENGR 102. Smart Manufacturing covers the technology being utilized in the recently introduced 4th industrial revolution, more commonly referred to as Industry 4.0. Topics include basic Smart Manufacturing principles, concepts, and enabling technologies, Industry 4.0 communications, sensors and their accompanying data, applications of industrial data, and manufacturing energy analytics.

IENG 417. Total Quality Management. 3 Hours.
PR: IENG 213. Fundamentals and philosophy of total quality management in industry and government. Includes implementation of quality function deployment and the tools of off-line quality assurance procedures.

IENG 422. New Product and Services Development. 3 Hours.
PR: Senior standing. This course introduces the new product and services development process including tools, methods, and techniques that are used by companies and innovators. Topics include the differences between B2B and B2C product development, impact of new technologies, as well as the multi-disciplinary nature of NPSD. The course is hands-on, and students apply their knowledge by developing a new product/service in teams.

IENG 423. Designing Decision Support System. 3 Hours.
PR: IENG 331. Basic concepts of software design of decision support systems that can be used by non-technical personnel in management positions.

IENG 431. Expert Systems in Industrial & Management Systems Engineering. 3 Hours.
PR: IENG 331. Expert systems design and development for manufacturing service applications; knowledge acquisition, representation, search techniques, inference engines, data base interfaces, algorithmic interfaces.

IENG 433. Energy Efficiency and Sustainability. 3 Hours.
Principles of energy efficiency for large industrial and large commercial building systems. Determination of energy usage, use of energy analysis and diagnostic equipment, and the development of energy efficiency measures including the economics related to implementation. Review of energy generation, renewable energy, smart grid, energy management, ASHRAE standards, and LEED. Sustainability aspects of energy efficiency.

IENG 445. Project Management for Engineers. 3 Hours.
PR: ENGR 102. This course provides an introduction to processes, tools, and techniques used to manage engineering projects within the context of an organization. It provides an overview of the engineering project management processes, groups, and knowledge areas defined by the Project Management Institute and introduces Microsoft Project as a project planning tool.

IENG 446. Plant Layout/Material Handling. 3 Hours.
PR: IENG 220 and IENG 220L and and IENG 350. Facility design and economic selection of material handling equipment in a production/service facility. Emphasizes optimization of materials and information flow.

IENG 455. Simulation by Digital Methods. 3 Hours.
PR: IENG 213 and IENG 331 or consent. Introduction to Monte Carlo simulation methods and their application to decision problems. Student identifies constraints on problems, collects data for modeling and develops computer programs to simulate and analyze practical situations. Interpretation of results emphasized.

IENG 460. Ergonomics. 3 Hours.
Study of physical and cognitive ergonomics of industrial and manufacturing processes. Focus will be on providing a technical foundation required to analyze, design, and develop human-technological system with a primary emphasis on the humans.

IENG 461. System Safety Engineering. 3 Hours.
PR: Consent. The concepts of hazard recognition, evaluation analysis and the application of engineering design principles to the control of industrial hazards.

IENG 471. Design of Productive Systems 1. 3 Hours.
PR: Senior standing and 21 hours of required IENG courses in industrial engineering. The integration of industrial engineering principles in the design of productive systems. Emphasis will be on analysis of different systems for productivity management.

IENG 472. Design of Productive Systems 2. 3 Hours.
PR: IENG 471 and senior standing in industrial engineering. Continuation of IENG 471.

IENG 473. Team Facilitation. 3 Hours.
This course prepares students to facilitate continuous improvement teams. Students learn basics of team operations, facilitation tools and facilitation practices.

IENG 474. Technology Entrepreneurship. 3 Hours.
Basic concepts and practices necessary to convert a technology idea into an entrepreneurial business.

IENG 481. Machine Learning for Industrial Engineers. 3 Hours.
PR: IENG 314 and IENG 331 with with a minimum grade of C- in each. Introduction to statistical machine learning, supervised and unsupervised learning approaches, model evaluation and assessment, regression, classification and clustering approaches, resampling methods.

IENG 485. Sales Engineering 2. 3 Hours.
PR: IENG 385 with a minimum grade of C-. This course builds upon foundational sales engineering concepts, emphasizing advanced strategies and techniques for managing complex sales processes.

IENG 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

IENG 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

IENG 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

IENG 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

IENG 496. Senior Thesis. 1-3 Hours.
PR: Consent.

IENG 498. Honors. 1-3 Hours.
PR: Student in Honors Program and consent by the honors director. Independent reading, study or research.

IEP 000. Intensive English Program. 15 Hours.
Study in the Intensive English Program, with a focus on improving English language skills. Course does not count toward any degree program.

IEP 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

IH&S 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Supervised practice in college teaching of occupational hygiene and safety. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

IH&S 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves placement with public or private enterprise for professional competence development.

IH&S 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

IH&S 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

IH&S 494. Seminar. 1-3 Hours.
PR: Consent Presentation and discussion of topics of mutual concern to students and faculty.

IH&S 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

IH&S 496. Senior Thesis. 1-3 Hours.
PR:Consent.

IH&S 497. Research. 1-6 Hours.
Independent research projects.

IH&S 498. Honors. 1-3 Hours.
PR: Student in Honors Program and consent by the honors director. Independent reading, study or research.

IMC 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

IMC 215. Principles of Integrated Marketing Communications (IMC). 3 Hours.
PR: Undergraduate IMC majors only. An introduction to the foundations of integrated marketing communications (IMC) with an emphasis on the promotional components (advertising and public relations) as well as the marketing functions of the IMC planning process.

IMC 315. Strategic Advertising and Public Relations Writing. 3 Hours.
PR: (ADPR 215 or ADV 215 or IMC 215 or PR 215 or STCM 215) and (JRL 215 or MDIA 215 or MDIA 215S) with a minimum grade of C- in each. This class provides exposure to and practice in developing the kinds of writing required in advertising and public relations careers. (Course is equivalent to ADV 315, PR 324 and STCM 315).

IMC 410. Introduction to Integrated Marketing Communications. 3 Hours.
PR: Admission to the program or permission. This course is the introductory course experience for the integrated marketing communications master's degree program. Students learn and apply the IMC planning process and examine the role of integration to ensure consistency of creative strategy and complementary use of paid, earned, and owned media. This course must be completed in a student's first academic term.

IMC 421. Advertising & PR Audience Insights & Analysis. 3 Hours.
PR: (ADPR 215 or ADV 215 or IMC 215 or PR 215 or STCM 215) and IMC 315 with a minimum grade of C- in each. This course focuses on in-depth examination of the multi-faceted world of advertising and public relations research, and the array of complex tools used to produce meaningful results. (Also listed as ADPR 421, ADV 421, PR 422, and STCM 521).

IMC 440. Introduction to Digital Marketing Communication. 3 Hours.
PR: Admission to the program or permission. This course is the introductory course experience for the digital marketing communications master's degree program. Students explore the fundamentals of digital media and the latest methods for collecting, creating and disseminating persuasive messages through digital media channels. This course must be completed in a student's first academic term.

IMC 459. IMC Capstone. 3 Hours.
PR: (ADPR 421 or STCM 421 or MKTG 325) with a minimum grade of C-. Students apply knowledge and skills from previous IMC courses to create an Integrated Marketing Communications campaign for a real-world client.

IMC 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

IMC 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

IMMB 150. Microbiology Colloquium 1. 2 Hours.
Peer and faculty-led learning experiences to introduce students to the disciplines of immunology and medical microbiology.

IMMB 175. Immunology and Medical Microbiology Colloquium. 2 Hours.
PR: IMMB 150 with a minimum grade of C-. The objective of this course is to introduce students to the basic concepts of immunology and microbial pathogenesis.

IMMB 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

IMMB 200. Immunology Colloquium 1. 2 Hours.
PR: IMMB 150 with a minimum grade of C-. Peer and faculty-led learning experiences to introduce students to the discipline of immunology.

IMMB 201. Basic Medical Microbiology. 3 Hours.
PR: BIOL 115 and BIOL 115L and BIOL 117 and BIOL 117L and IMMB 150 and PR or CONC: IMMB 201L with a minimum grade of C- in all. This course will explore broad aspects of introductory microbiology including microbial cell structure, growth, and metabolism, with an emphasis on microorganisms that cause disease.

IMMB 201L. Basic Medical Microbiology Laboratory. 1 Hour.
PR: BIOL 115 and BIOL 115L and BIOL 117 and BIOL 117L and IMMB 150 and PR or CONC: IMMB 201 with a minimum grade of C- in all. Laboratory exercises on the study of pathogenic microorganisms and clinical laboratory techniques.

IMMB 233. Basic Science Applications. 2 Hours.
Students will consider how the content learned in STEM courses (i.e., chemistry, biology, calculus) can be applied to various biomedical and healthcare careers.

IMMB 250. Microbiology Colloquium 2. 2 Hours.
PR: IMMB 150 with a minimum grade of C-. Peer and faculty-led learning experiences to continue to introduce students to the discipline of medical microbiology.

IMMB 275. Immunology Colloquium 1. 2 Hours.
PR: IMMB 175 with a minimum grade of C- and PR or CONC: IMMB 276. Peer and faculty-led learning experiences to introduce students to the discipline of immunology.

IMMB 276. Principles of Immunobiology. 3 Hours.
PR: BIOL 117 and BIOL 117L and IMMB 175 and PR or CONC: IMMB 275 with a minimum grade of C- in all. Study of the basic concepts underlying the mechanisms of innate and adaptive immunity.

IMMB 287. Introduction to IMMB Research Methods. 1 Hour.
This will be a 1-credit 8-week course that introduces students into research in the biomedical sciences and emphasizes how to select a research lab and ethical lab conduct.

IMMB 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

IMMB 300. Immunology Colloquium 2. 2 Hours.
PR: IMMB 200 with a minimum grade of C-. Peer and faculty-led learning experiences to continue to introduce students to the discipline of immunology.

IMMB 301. Basic Medical Microbiology. 3 Hours.
PR: IMMB 150 and BIOL 219 and PR or CONC: IMMB 301L with a minimum grade of C- in all. Lectures exercises on the study of pathogenic microorganisms and clinical laboratory techniques.

IMMB 301L. Basic Medical Microbiology Laboratory. 1 Hour.
PR: IMMB 150 and BIOL 219 and PR or CONC: IMMB 301 with a minimum grade of C- in all and students must be enrolled in IMMB undergraduate program. Laboratory exercises on the study of pathogenic microorganisms and clinical laboratory techniques.

IMMB 302. Principles of Immunobiology. 3 Hours.
PR or CONC: IMMB 200 with a minimum grade of C-. Study of the basic concepts underlying the mechanisms of innate and adaptive immunity.

IMMB 305. Microbial Genetics. 3 Hours.
PR: BIOL 219 and BIOL 219L and IMMB 201 and IMMB 201L with a minimum grade of C- in all. Molecular aspects of mutation, gene transfer mechanisms, genetic mapping, and genetic control using bacteria and bacteriophage systems as models.

IMMB 310. Bacterial Pathogenesis. 3 Hours.
PR: IMMB 305 with a minimum grade of C- and PR or CONC: IMMB 310L or consent. Pathogenic bacteriology with an emphasis on the mechanisms of pathogenesis. Topics include microbial adherence, motility, toxin production and mechanisms, and normal flora and disease.

IMMB 310L. Bacterial Pathogenesis Laboratory. 1 Hour.
PR: IMMB 410 with a minimum grade of C- and PR or CONC: IMMB 310 and students must be enrolled in the IMMB Program. Laboratory exercises for understanding mechanisms of microbial pathogenesis as it relates to human infectious disease.

IMMB 320. Cellular Immunobiology. 3 Hours.
PR: IMMB 302 with a minimum grade of C-. Emphasis on understanding the cellular elements that impact immune responses. This course builds on fundamental principles discussed in IMMB 302 to address areas of current research in immunobiology.

IMMB 327. Parasitology. 2 Hours.
PR: For medical technology students, other students with consent. Study of animal parasites and disease vectors with emphasis on disease manifestations, parasite biology, and laboratory diagnosis.

IMMB 330. Etiologies of Rural Appalachian Diseases. 3 Hours.
This course will encourage students to think holistically about the etiologies of immunological disorders and infectious diseases in order to improve diagnosis, treatment and prevention in rural Appalachia.

IMMB 340. Medical Mycology. 2 Hours.
PR: IMMB 150 with a minimum grade of C- or instructor consent. Study of fungal diseases and mycology with a focus on mycoses of body systems, disease manifestations and fungal biology.

IMMB 350. IMMB Careers and Professional Development. 1 Hour.
The goal of this course is to help students explore different viable career paths in the immunology and microbiology fields. Students will investigate academic and non-academic careers related to immunology and infectious disease and craft personal statements and CVs that will help facilitate applications for graduate or professional schools or employment.

IMMB 360. Zoonotic and Vector Borne Diseases. 2 Hours.
PR: IMMB 150 and (AEM 341 or BIOL 115) with a minimum grade of C- in each or instructor consent. Many significant infectious diseases in humans have their foundation as zoonotic diseases. New and emerging diseases often have their origins as zoonotic diseases. The understanding of these pathogens and mechanisms to control exposure and infection are crucial to prevent future epidemics and public health initiatives.

IMMB 375. Immunology Colloquium 2. 2 Hours.
PR: IMMB 275 and IMMB 276 and IMMB 320 with a minimum grade of C- in all. Peer and faculty-led learning experiences to continue to introduce students to the discipline of immunology.

IMMB 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

IMMB 400. Immunology/Microbiology Journal Club. 1 Hour.
PR or CONC: IMMB 302 with a minimum grade of C-. Review and discussion on current immunology and medical microbiology literature. Seniors are required to lead one discussion session before graduation.

IMMB 405. Scientific Integrity. 2 Hours.
PR: IMMB 350 with a minimum grade of C-. Discussion and review of topics addressing fundamental issues in maintenance of scientific integrity in biomedical research.

IMMB 410. Microbial Genetics. 3 Hours.
PR: IMMB 301 with a minimum grade of C-. Molecular aspects of mutation, gene transfer mechanisms, genetic mapping, and genetic control using bacteria and bacteriophage systems as models.

IMMB 420. Molecular Immunobiology. 3 Hours.
PR: BIOC 339 and IMMB 320 and IMMB 375 with a minimum grade of C- in each and PR or CONC: IMMB 420L. Study of the structure and function of the families of molecules employed by the immune system to recognize and initiate the immune response and the signaling pathways within the cell involved in the immune system.

IMMB 420L. Molecular Immunobiology Laboratory. 2 Hours.
PR: BIOC 339 and IMMB 320 and IMMB 375 with a minimum grade of C- in each and PR or CONC: IMMB 420. Laboratory exercises designed to complement IMMB 420 and understand molecular mechanisms and signaling pathways employed by the immune system to initiate and sustain immune responses against pathogens.

IMMB 422. Bioinformatics Resource for Epigenomic Data Analysis. 2 Hours.
The course introduces basic concepts in epigenomic data analysis for several commonly used genome-wide profiling techniques, such as RNA-Seq, ChIP-seq, and DNase-seq/ATAC-seq, and offers hand-on experience for a set of frequently used standalone GUI tools, online databases, and web servers.

IMMB 450. Immunology/Microbiology Journal Club 2. 1 Hour.
Review and discussions on current immunology and medical microbiology literature. Seniors are required to lead one discussion session before graduation.

IMMB 460. Contemporary Issues for Majors. 3 Hours.
PR: IMMB 320 with a minimum grade of C-. Detailed coverage for major issues of contemporary research in immunobiology.

IMMB 470. Medical Virology. 3 Hours.
PR: IMMB 201 and IMMB 201L with a minimum grade of C- in each. Molecular biology of viruses that are important both biologically and medically. Includes a basic introduction to replication and genetics as well as current topics in molecular virology.

IMMB 480. Vaccinology. 3 Hours.
Emphasis on understanding vaccinology in the contexts of historical significance, vaccine models, pre-clinical to clinical development, human efficacy, and relationships with the public.

IMMB 484. Senior Thesis. 3 Hours.
PR: IMMB 310 and IMMB 320 with a minimum grade of C- in each. Essays and oral presentations by senior students covering contemporary topics in immunology and medical microbiology. Senior students are required to present one seminar before graduation.

IMMB 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

IMMB 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

IMMB 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

IMMB 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

IMMB 496. Senior Thesis. 1-3 Hours.
PR: Consent.

IMMB 497. Research. 1-6 Hours.
Independent research projects.

INBS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

INBS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated for a maximum of 18 hours.) Prearranged experiential learning program, to be planned supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

INBS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

INDS 498. Honors. 1-3 Hours.
PR: Students in the honors program and consent by the Honors Director. Independent reading, study or research.

INTS 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

INTS 199. Orientation to International Studies. 1,2 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities and opportunities.

INTS 288. Professional Development: Success After International Studies. 1 Hour.
PR: INTS 191. Students develop professional skills, both oral and written, including resume and cover letter writing, interviewing skills, conducting a successful job search, and the graduate school application process. Designed for international studies majors.

INTS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

INTS 300. Social Inquiry in International Studies. 3 Hours.
PR: POLS 260. This course is an introduction to the fundamental concepts and research methods that form the foundation of international studies. Primary focus is on research design, such as the steps and data collection techniques necessary to build and execute a plan to test an idea or hypothesis in international studies.

INTS 360. The European Union and Contemporary European Affairs. 3 Hours.
PR: Enrollment in the WVU Strasbourg Semester. An introduction to the European Union with a focus on its involvement in contemporary European affairs, including foreign policy, economic, and human rights concerns and issues. Taught as part of the WVU Strasbourg Semester, with site visits to EU institutions in Brussels, Strasbourg, and Luxembourg.

INTS 361. European Identity and French-German Cooperation along the Rhine. 3 Hours.
Examination of European identity as the basis of cooperation between Germany and France since 1945. Class will examine the forms of cooperation through lectures and site visits in Germany and France. Emphasis is on the historical and cultural sources of cooperation after WWI and WWII as well as the rise of the European Union.

INTS 362. . 3 Hours.
Examines socially responsible business practices and leadership in Europe, focusing on democratic institutions, sustainability, and intercultural communication. Taught as part of the WVU Strasbourg Semester, students will develop leadership competencies through case studies, simulations, and experiential visits.

INTS 388. Professional Development: The Job Search. 1 Hour.
PR: INTS 288. Designed for international studies majors, this course will develop skills, both oral and written, including professional document preparation, conducting a successful job search, applying for a nationally competitive scholarship, and the graduate school application process.

INTS 488. Capstone International Studies. 1-3 Hours.
Capstone experience required for all majors. Options include study abroad, internships, simulations, and senior research projects.

INTS 488A. Capstone International Studies. 1-3 Hours.
Capstone experience required for all majors. Options include study abroad, internships, simulations, and senior research projects.

INTS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated for a Maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

INTS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

INTS 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.

INTS 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

ITAL 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ITAL 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ITAL 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ITAL 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ITAL 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ITAL 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics on available through regular course offerings.

ITAL 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ITAL 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

JAPN 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

JAPN 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

JAPN 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to maximum of 18 hours). Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

JAPN 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

JAPN 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

JAPN 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

JAPN 496. Senior Thesis. 1-3 Hours.
PR: Consent.

JAPN 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

JRL 116. Academic Success Seminar. 1 Hour.
This course is designed to help College of Media students who have experienced academic difficulties to understand their academic status and to help them identify strategies, techniques and resources that can assist them in overcoming their particular performance challenges. Applicable College and WVU services, policies and procedures also are discussed.

JRL 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

JRL 210S. Visual Journalism and New Media. 3 Hours.
PR: College of Media major or minor. Theory and principles of visual communication and image culture.

JRL 220S. Introduction to Photojournalism. 3 Hours.
Basic techniques of journalistic photography, digital imaging and editing. Students must have access to a film or digital camera.

JRL 230S. Interviewing for Journalism. 1 Hour.
PR: MDIA 215S and MDIA 225S with minimum grades of C-. Students will grow in their ability to research, plan and execute interviews across platforms.

JRL 235S. Video Editing. 1 Hour.
PR: (JRL 215 or MDIA 215 or MDIA 215S) with a minimum grade of C-. This course is designed to teach broadcast journalism students advanced digital video and audio techniques for news productions, including field reports, newscasts, and studio-based programs.

JRL 236S. Podcast Producing. 1 Hour.
Open to all College of Media majors, this one-credit-hour skills-based course involves significant reporting and production roles to teach students how to produce professional podcasts through a class podcast series as well as through reading, listening and critique assignments.

JRL 237S. Advanced Video Editing. 1 Hour.
PR: (JRL 215 or MDIA 215 or MDIA 215S) with a minimum grade of C-. This class builds upon the basic skills of Adobe After Effects video editing. Students will use this software to create and align full-page graphics, to animate images and texts, and to render proper code, as well as other related skills.

JRL 238S. Voice Performance for Broadcasting. 1 Hour.
Open to all College of Media majors, this one-credit-hour skills-based course focuses on students' development of vocal mechanics and interpretative performance for announcers, newscasters, interviewers and narrators of various broadcasting and announcing situations. Students work on delivery, cadence, diction and on-air presence in both recorded and live situations.

JRL 240S. Immersive Storytelling: AR/VR. 1 Hour.
Open to all College of Media majors, this one-credit-hour production-oriented course allows students to explore new forms of storytelling through immersive, interactive technologies such as virtual and augmented reality. Students use design thinking and emerging tools and platforms to create 360-degree video, 3d models, volumetric video and interactive augmented reality.

JRL 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

JRL 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

JRL 318S. Beat Reporting. 3 Hours.
PR: (JRL 215 or MDIA 215 or MDIA 215S) with a minimum grade of C-. Essentials of developing and covering a news beat. Students generate stories, cultivate sources, and discover their community.

JRL 319S. Editing and Curation. 3 Hours.
PR: (JRL 215 or MDIA 215 or MDIA 215S) with a minimum grade of C-. Students develop the skills necessary to edit and design content for online and print media outlets.

JRL 320S. Advanced Photojournalism. 3 Hours.
PR: (JRL 220 or JRL 220S) with a minimum grade of C-. Introduction to advanced techniques and concepts in visual journalism for print and electronic media. Color, lighting, studio and digital camera techniques.

JRL 321S. Media Design. 3 Hours.
PR: JRL 215 or MDIA 215S with a minimum grade of C-. An introduction to the design of newspapers, magazines and internet publications.

JRL 325S. Podcast Reporting & Producing. 3 Hours.
PR: (JRL 215 or MDIA 215 or MDIA 215S) and (JRL 225 or MDIA 225 or MDIA 225S) with a minimum grade of C- in all. Podcasting is a growing aspect of the media industry. In this course, students will learn how to report and produce a professional-level podcast through a class podcast series as well as through listening to and critiquing class assignments and professional podcasts.

JRL 328. Media Law and Ethics. 3 Hours.
PR: JRL 215 of MDIA 215 with a minimum grade of C-. This course is an in-depth exploration of the complex ethical and legal media landscape, with an emphasis on key historical precedents, new cases and challenges related to emerging technology, digital disinformation, artificial intelligence, new problems in social media and other current issues in journalism, public relations and advertising.

JRL 330S. Sports and Adventure Media Writing. 3 Hours.
PR: (JRL 215 or MDIA 215 or MDIA 215S) and (JRL 225 or MDIA 225 or MDIA 225S) with a minimum grade of C- in all. Focuses on writing media content about sports and adventure activities for journalism and strategic communications purposes. Attention is given to writing styles used for different mediums as well as strategies to incorporate audience insight and engagement.

JRL 335S. Video and Audio News Writing. 3 Hours.
PR: (JRL 215 or MDIA 215 or MDIA 215S) with a minimum grade of C-. Gathering, researching, and evaluating facts; reporting and writing news for radio and television; editorial decision making and responsibility; broadcast news ethics.

JRL 341S. Data and Design. 3 Hours.
PR: MDIA 215 or MDIA 215S or MDIA 225 or MDIA 225S with a minimum grade of C-. This course introduces students to the journalistic collection, analysis, and presentation of data.

JRL 380S. Sports and Adventure Media Video Storytelling. 3 Hours.
PR: (JRL 330 or JRL 330S or JRL 335 or JRL 335S) and PR or CONC: (JRL 235S or JRL 488) with a minimum grade of C- in each. Focuses on creating sports and adventure media video stories for journalism and strategic communications purposes. Attention is given to video storytelling techniques. Involves direct practice covering sporting events, producing video content and applying audience insight and engagement techniques.

JRL 385S. Audio Reporting. 3 Hours.
PR: JRL 335 or JRL 335S or TVJ 319 with a minimum grade of C-. Writing and reporting news for radio and other digital audio sources.

JRL 386S. Beginning Video Reporting. 3 Hours.
PR: (JRL 330 or JRL 330S or JRL 335 or JRL 335S) and (JRL 235S or JRL 488) with a minimum grade of C- in each. Reporting, writing and producing sports stories for television using digital video technology; emphasis on sports writing, visual storytelling, editorial decision making, and ethical and legal considerations.

JRL 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

JRL 408. The Community Newspaper. 2 Hours.
(Open to all University students.) Fundamental problems and techniques in operation of community newspapers.

JRL 411. Experimental Journalism. 3 Hours.
PR: JRL 215 or MDIA 215 with a minimum grade of C- and senior status or departmental permission. A project-based, immersion course in experimental journalism using new technology such as virtual reality, augmented reality, sensors, drones and other experimental storytelling methods.

JRL 412. Sport Journalism. 3 Hours.
PR: ADV 201 or ADPR 215 or ADV 215 or JRL 215 or MDIA 215 or MDIA 215S or PR 215 or STCM 215 with a minimum grade of C-. Develops critical thinking skills in reporting and writing stories. Students examine the value of sport journalism; the way sport functions in society, and gain an understanding of ethics in sport journalism.

JRL 419. Entertainment Reporting. 3 Hours.
PR: (JRL 101 or MDIA 101) and (ADPR 215 or PR 215 or STCM 215) with a minimum grade of C-. This course is an examination of the issues facing the field of entertainment reporting. Students will cover beats, produce reporting and examine the entertainment industry.

JRL 420S. Feature Writing. 3 Hours.
PR: (JRL 215 or MDIA 215 or MDIA 215S) with a minimum grade of C-. Developing writing, and editing news features, personality profiles, color pieces, issue oriented articles and human impact stories for news, public relations, and film.

JRL 424S. Adventure Travel Writing & Photography. 3 Hours.
PR: (JRL 215 or MDIA 215 or MDIA 215S) and (JRL 225 or MDIA 225 or MDIA 225S) with a minimum grade of C-. Best practices and ethical considerations of travel and adventure journalism, including photography and point-of-view videography, and appropriate use of digital platforms, blogging and social media for journalistic purposes. Includes a travel component.

JRL 426S. Investigative Reporting. 3 Hours.
PR: (JRL 318 or JRL 318S or JRL 386 or JRL 386S or TVJ 386) with a minimum grade of C-. Reporting on the agencies, structures, and programs that make society work, including circuit court and police.

JRL 429. Opinion Writing. 3 Hours.
PR: JRL 215 or MDIA 215 with a minimum grade of C-. Students will analyze news issues and write opinion-based pieces.

JRL 430S. Social Media and Journalism. 3 Hours.
PR: (JRL 215 or MDIA 215 or MDIA 215S) with a minimum grade of C-. This lab course identifies and applies the principles behind social media applications such as blogs and networking sites.

JRL 431S. Multimedia Storytelling. 3 Hours.
PR: (JRL 225 or MDIA 225S) and (JRL 318S or JRL 320S) with a minimum grade of C- in each. This capstone course explores digital narrative storytelling, employing the wide variety of media and interactive applications that online publishing makes possible. However, emphasis is on visual media. Students will learn to facilitate audience comprehension and engagement while educating and informing about contemporary societal issues.

JRL 432. Social Media Strategy. 3 Hours.
This course examines how social media channels can be utilized to meet the goals of corporate, non-profit, political and issue based outreach messaging.

JRL 433. Social Media Applications. 3 Hours.
This course examines how messages can be crafted for maximum success and reach in the social media landscape. Students will explore different methods for monitoring and measurement, explore current trends in social media and examine case studies of successful social media integration across multiple platforms.

JRL 434. Social Media Campaigns. 3 Hours.
This course examines case studies where social media was used successfully in instances of promotion, outreach and crisis communication.

JRL 435S. Live Sports Video Production. 3 Hours.
Production and coverage of live sporting events, including television terminology, camera operation, live directing, live technical directing, digital signage execution, instant replay, work ethic, and promptness. Involves direct practice with over ten of WVU's Division 1 sports.

JRL 440S. Documentary Storytelling. 3 Hours.
PR: JRL 220S with a minimum grade of C- or consent. Development of practical and analytical skills in documentary production, including research, story development, scripting and editing.

JRL 441. Internship. 1-3 Hours.
PR: (JRL 215 or MDIA 215 or MDIA 215S) with a minimum grade of C-. Full-time employment for a minimum of 10 weeks under a signed contract detailing the terms of the experience. (Graded pass/fail.).

JRL 442. Practicum. 1-2 Hours.
PR: (JRL 215 or MDIA 215S) with a minimum grade of C- and consent. Students must have a signed contract detailing terms of the learning experience. 8 to 20 hours per week for a minimum of 10 weeks while taking other courses. (Graded on a pass/fail basis.).

JRL 445S. International Media 1. 3 Hours.
PR: (JRL 215 or MDIA 215 or MDIA 215S) with a minimum grade of C-. A combination of classroom theory and practical application of the function of media in an international setting.

JRL 446. International Media 2. 1-6 Hours.
PR: Consent. Centers around a trip that involves the study of media in the country students are visiting. Usually a continuation of International Media 1.

JRL 448S. Digital Publication: Social Video. 3 Hours.
PR: (JRL 215 or MDIA 215 or MDIA 215S) and (JRL 225 or MDIA 225 or MDIA 225S) with a minimum grade of C- in each. This course teaches students how to engage an audience by curating content and video and producing and packaging this information in explainer and short social videos for a professional digital publication called 100 Days. In addition, students obtain first-hand experience producing mobile-first content.

JRL 450. Writing for Health Promotion. 3 Hours.
PR: (JRL 101 or MDIA 101) and (PR 215 or ADV 215) with a minimum grade of C-. A writing-intensive course that examines the evolving field of health communication. Students write health messages for distinct audiences. Some topics include: provider-patient communication and persuasive messages for social networks, social influence, and social support.

JRL 452. Applied Health Promotion. 3 Hours.
PR: (JRL 101 or MDIA 101) and (ADV 215 or PR 215) with a minimum grade of C-. Primarily examines in-depth case studies of health communication messages with an emphasis on understanding how audiences are targeted and influenced by these messages.

JRL 454. Health Promotion Campaigns. 3 Hours.
PR: (JRL 101 or MDIA 101) and (ADV 215 or PR 215) with a minimum grade of C-. Applies IMC principles, theories, and techniques to multifaceted health promotion and disease prevention campaigns. Examines non-profit and public organizations that utilize IMC strategies to promote issues such as HIV/AIDS awareness, cancer screening, and child vaccinations.

JRL 457S. Advanced Adventure Media Production. 3 Hours.
PR: JRL 380S with a minimum grade of C-. Focuses on advanced video production for journalism or strategic communications purposes. Attention is given to in-depth story development and audience insight and engagement techniques associated with the story production. Involves direct practice of adventure sports or travel location-based video storytelling and audience building.

JRL 458. Interactive Media and Audience Building. 3 Hours.
This course introduces students to the latest and evolving attributes of media entrepreneurship, new economic models for media, and audience building across emergent platforms.

JRL 459S. Multimedia News Publication. 3 Hours.
PR: (JRL 225 or MDIA 225 or MDIA 225S) and (JRL 318 or JRL 318S or JRL 320 or JRL 320S) with a minimum grade of C- in all. In this lab/workshop-style capstone class for journalism majors, students will produce stories and multimedia packages for publication and broadcast.

JRL 467S. Public Affairs Show-Morgantown Today. 3 Hours.
PR: (JRL 380 or JRL 380S) or (JRL 386 or JRL 386S) with a minimum grade of C-. This course is run as an actual public affairs television show. This course will address matters of public policy and interest including topics on education, culture and politics. Students will learn how to produce, gather and report on public affairs issues. Students serve as the reporters, hosts and/or technical crew during show tapings at the Waterfront TV Studio.

JRL 484S. Advanced Sports and Adventure Video Production. 3 Hours.
PR: (JRL 380 or JRL 380S) with a minimum grade of C-. Focuses on sports and adventure sports video reporting and production for a magazine show. Production of the show includes in-the-field reporting, studio operations and producing. Attention is given to sports and adventure media industry standards.

JRL 487S. Advanced Video Reporting and Producing. 3 Hours.
PR: JRL 380 or JRL 380S or JRL 386 or JRL 386S with a minimum grade of C-. This course is run as an actual newsroom to teach students how to produce, gather and report news. Students are assigned “beats,” and work individually and in teams to produce news for local broadcast. Students serve as the talent and/or technical crew during newscast tapings and learn how to promote their work and engage audiences via professional social media use.

JRL 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant. (Graded on a pass/fail basis.).

JRL 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours). Prearranged experiential learning program, to be planned; supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development. (Graded on a pass/fail basis.).

JRL 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

JRL 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

JRL 495. Independent Study. 1-3 Hours.
Faculty supervised study of topics not available through regular course offerings.

JRL 496. Senior Thesis. 1-3 Hours.
PR: Consent.

JRL 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

JRL 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

LANG 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

LANG 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

LANG 321. Language Matters. 3 Hours.
Focuses on issues regarding language, culture, and “myths,” including facts about language learning, cultural dynamics in relation to the use of language, and current cross-cultural issues in the aspect of language as a medium.

LANG 322. Second Language Acquisition. 3 Hours.
Study of linguistic concepts, development patterns, and contributing factors relevant to second language acquisition.

LANG 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

LANG 421. The Teaching of Foreign Languages. 3 Hours.
PR: Consent. Required of all students who are prospective foreign language teachers on the secondary level.

LANG 422. Second Language Reading. 3 Hours.
PR: LING 101 or LING 311 or equivalent. Study of the second language reading process, relevant research findings, curricular issues, and classroom instructional practices.

LANG 423. Teaching English Overseas. 3 Hours.
Teaching English Overseas is an introductory course focusing on principles and practices of teaching English as an international language, with emphasis on how these experiences are shaped by cultural, economic, educational, institutional, and social contexts.

LANG 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

LANG 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

LANG 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

LANG 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

LANG 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

LANG 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

LANG 496. Senior Thesis. 1-3 Hours.
PR: Consent.

LANG 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

LARC 105. Introduction to Landscape Architecture, Environmental Design and Planning. 3 Hours.
A general overview of the field of landscape architecture, environmental design and planning. The course reviews the practices of design and planning professionals and their connections to society. An emphasis is placed on past development traditions and current sustainable development methods, strategies, and impacts of planning and design through the review of past and current projects.

LARC 120S. Landscape Architectural Drawing Studio. 3 Hours.
PR: Landscape Architecture majors only. Introduction to elements of visual techniques in drafting, basic design, and environmental systems.

LARC 121S. Landscape Architectural Graphics Studio. 3 Hours.
Introduction to design and graphic methodology with applications to current standards. Development of principles of communication in two- and three-dimensional visual thinking applicable to environmental design professions. (Two 3-hr. studios.).

LARC 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

LARC 212. History of Landscape Architecture. 3 Hours.
A broad survey of the history of the designed human environment with emphasis on the development of landscape architecture. (Does not fulfill Cluster A for landscape architecture students.).

LARC 220. Landscape Field Drawing. 3 Hours.
PR: LARC 121 with a minimum grade of C- or consent. Outdoor sketching and drawing as a tool for field observation and to communicate landscape design ideas. Students sample a range of media and techniques, then focus and develop their individual drawing style. Offered in Fall. (1.5-hr lecture, 3-hr studio).

LARC 223. Computer Graphics in Landscape Architecture. 3 Hours.
PR: LARC 121. Application of basic computer graphics to include drafting, rendering, and visualization software used in developing landscape architectural plans and environment analysis. (Two 3-hr. studios.).

LARC 224. Digital Design Graphics for Landscape Architecture. 2 Hours.
This course is designed to provide students with a working knowledge of how to generate and manipulate graphic images digitally. Over the course of the semester, we will cover the basics of the three most common Adobe Creative Cloud programs used by landscape architects: Photoshop, Illustrator, InDesign and Acrobat.

LARC 229. Landscape Architecture. 3 Hours.
PR: For non- landscape architecture majors only. An appreciation of the basic principles of planting design and information pertaining to the use of ornamental plants around the home. (2 hr. lec., one 2-hr. studio.).

LARC 231. Landscape Construction Materials and Methods. 3 Hours.
PR: LARC 250. A study of materials used in landscape architectural construction with emphasis on methods of construction and the preparation of construction drawings for design implementation. (2 hr. lec., one 2-hr. studio.).

LARC 250S. Theory of Landscape Architectural Design Studio. 3 Hours.
PR: LARC 121 or LARC 121S. Application of elements and principles of art and design to landscape architecture.

LARC 251. Landscape Architectural Design. 1 Hour.
PR: LARC 250 or equivalent and PR or CONC: LARC 251S. Investigation and application of various factors which play a role in the design of natural and man-made environment.

LARC 251S. Landscape Architectural Design Studio. 2 Hours.
PR or CONC: LARC 251. Landscape Architectural Design Studio.

LARC 260. Ornamental Woody Plants and Groundcovers. 3 Hours.
PR: BIOL 101 and BIOL 103 or equiv. Design uses, ornamental qualities, cultural requirements and identification of woody plants and groundcovers in West Virginia. Field course. (One day field trip required at student's expense). (Two 3-hr. studios.).

LARC 261. Planting Design. 1 Hour.
PR: LARC 250 and LARC 260 and PR or CONC: LARC 261S. Study of planting design theory and practice, including uses of plants in site and environmental design, planting design techniques and preparation of planting plans, construction details, and technical specifications.

LARC 261S. Planting Design Studio. 2 Hours.
PR or CONC: LARC 261. Planting Design Studio.

LARC 271. Portfolio Design. 1 Hour.
PR: LARC 121 and LARC 250 and LARC 260. Introduction to graphic design and presentation formals and their application for the preparation of the second year portfolio. (One 2-hr. studio.).

LARC 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

LARC 330S. Landscape Architectural Construction 1 Studio. 4 Hours.
PR: LARC 231 and LARC 251S and MATH 124 or higher. The study of the technical principles of grading design, their application to site planning, and preparation of land form grading plans.

LARC 331. Advanced Grading & Stormwater. 1 Hour.
PR: LARC 330 with a minimum grade of C- and PR or CONC: LARC 331S. Study and preparation of parkway plans (road alignment), surface and sub-surface drainage plans, advanced grading plans, and cost estimates.

LARC 331S. Advanced Grading & Stormwater Studio. 3 Hours.
PR or CONC: LARC 331. Advanced Grading & Stormwater Studio.

LARC 332. Recreation, Trails, and Community Development. 3 Hours.
Using outdoor recreation as a facilitator of community development, this course will provide a preview of comprehensive trail planning strategies guiding sustainable trail development, including the benefits of trails (economic, health, and social), strategies for stakeholder engagement, funding, activation and programming, and evaluation. Online, 3-credit undergraduate course, cross listed with LARC 532 (for graduate students).

LARC 334. Sustainable Trails: Design Concepts. 3 Hours.
Plan trail networks according to current best practices, responding to site topography and aesthetics while incorporating skills progression and accessibility for trail users of all skill levels. Online, 3-credit undergraduate course, cross listed with LARC 534 (for graduate students).

LARC 350. Landscape Architectural Design 2. 1 Hour.
PR or CONC: LARC 350S. Study of medium scale site design with emphasis on site analysis, design methodology and presentation.

LARC 350S. Landscape Architectural Design 2 Studio. 3 Hours.
PR or CONC: LARC 350. Landscape Architectural Design 2 Studio.

LARC 351. Landscape Architectural Design 3. 1 Hour.
PR or CONC: LARC 351S. Site-design problems dealing with complex environmental systems emphasizing rural and urban design. Projects are integrated with landscape architectural construction.

LARC 351S. Landscape Architectural Design 3 Studio. 3 Hours.
PR or CONC: LARC 351. Landscape Architectural Design 3 Studio.

LARC 360. Natural Systems Design. 1 Hour.
PR or CONC: LARC 360S. Study of native and naturalized plants of this region and their ecological tolerances, importance to site analysis, and use in planting design. (2-day field trip required at student's expense.).

LARC 360S. Natural Systems Design Studio. 3 Hours.
PR or CONC: LARC 360. Natural Systems Design Studio.

LARC 361. Interior Plantscaping. 2 Hours.
PR: BIOL 101 and BIOL 103 or PLSC 206. The study of plants appropriate to interior plantscaping and their special needs and uses in design situations. (One day field trip required at student's expense.) (1 hr. lec., one 3 hr. studio.).

LARC 423. Advanced CAD. 2 Hours.
PR: LARC 223 or equivalent. Study and application of advanced computer techniques including Land Development Desktop and AutoCAD. (Two 2 hr. studios.).

LARC 435. Sustainable Trails: Design Detailing & Drainage. 3 Hours.
PR: LARC 334 or (LARC 231 and LARC 331 and LARC 360) with a minimum grade of C- in all. Refine trail masterplans for costing, bidding and construction documentation with site-specific detailing and specifications, while incorporating stormwater management best practices and ecological restoration principles. Online, 3-credit undergraduate course, cross listed with LARC 535 (for graduate students).

LARC 437. Sustainable Trails: Practicum Experience. 1-3 Hours.
PR: (LARC 435 and RPTR 436) with a minimum grade of C-. Engage directly in a trail project’s design, construction, maintenance and/or monitoring, through a service-learning capstone project in sustainable trails development. Work with stakeholders and community representatives directly to support recreation economy development. Can be repeated for credit: students can enroll for 1, 2, or 3 credits at once. Online, undergraduate course, cross listed with LARC 537 (for graduate students).

LARC 444. Western European Gardens, Landscapes and Architecture: Field Study. 6 Hours.
This is a travel course that includes visits to Belgium, France, Netherlands and Germany and focuses on a variety of environments- urban, agricultural/rural, and natural. Major cities in the travel experience may include Brussels, Paris, and Amsterdam. The core work of the course consists of a journal/sketchbook. (Also listed as PLSC 444.).

LARC 448. Design Analysis. 2 Hours.
PR: Consent. Analysis of planning and design projects to offer solutions to a given problem.

LARC 450. Advanced Landscape Architectural Design 1. 1 Hour.
PR: LARC 331 and LARC 351 and LARC 360 and PR or CONC: LARC 450S. Comprehensive design problems integrating all aspects of site design, planting design and construction. Includes advanced projects for urban and rural sites.

LARC 450S. Advanced Landscape Architectural Design 1 Studio. 4 Hours.
PR or CONC: LARC 450. Advanced Landscape Architectural Design 1 Studio.

LARC 451. Advanced Landscape Architectural Design 2. 1 Hour.
PR: LARC 450 and PR or CONC: LARC 451S. A comprehensive problem in landscape architecture in which the student demonstrates proficiency acquired from their program of study.

LARC 451S. Advanced Landscape Architectural Design 2 Studio. 4 Hours.
PR or CONC: LARC 451. Advanced Landscape Architectural Design 2 Studio.

LARC 452. Contemporary Issues in Landscape Architecture. 3 Hours.
PR: LARC 250 and PR or CONC: LARC 251. A series of seminar discussions exploring current and future trends in the practice of landscape architectural design, planning, and management.

LARC 464. Designing Healthy Places. 3 Hours.
Examination and analysis of environmental design solutions that have positive impacts for individual and community health outcomes.

LARC 465. Regional Design. 3 Hours.
PR: Consent. Consideration of regional landscapes in order to effectively relate design to the ecology and development of a region.

LARC 466. Introduction to Urban Design Issues. 3 Hours.
PR: Consent. Community analysis methods, city and small town planning and management of community growth. The course focus is on understanding community and urban design issues and growth management. (Offered in fall of odd years.).

LARC 484. Professional Practice. 3 Hours.
PR: Consent. Procedures in preparation of contract documents, fees, estimates, operation of an office, and relationship to clients and contractors. (3 hr. lec.).

LARC 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

LARC 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

LARC 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

LARC 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of mutual concern to students and faculty.

LARC 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

LARC 496. Senior Thesis. 1-3 Hours.
PR: Consent.

LARC 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

LAW 493. Special Topics. 1-9 Hours.

LDR 201. Principles of Leadership. 3 Hours.
This course serves as an introduction to leadership theory and practice. The course will examine various aspects of the literature on leadership; provide practice for developing leadership skills; and offer personal experiences for self-reflection.

LDR 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

LDR 301. Problems in Leadership. 3 Hours.
PR: LDR 201. Students will survey a series of case studies, both historical and imagined, in which leadership either succeeds or fails.

LDR 330. Leadership and Athletics. 3 Hours.
PR: LDR 201. Examines leadership in the context of sport with historical and contemporary examples. Different levels of sport will be discussed. Issues related to followership and organizational culture, relevance of motivational theory, and team relationships are explored.

LDR 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

LDR 401. Leadership in Action. 3 Hours.
PR: LDR 201 and LDR 301. This course serves to demonstrate that students have learned how strong, innovative leadership leads to organizational change. Students will tailor this capstone- level/service-learning course to suit their own major and interests.

LDR 435. Women and Leadership. 3 Hours.
Uses academic literature related to leadership, women, and some feminist theory to analyze differences in female and male leadership characteristics, behaviors, and effectiveness.

LDR 445. Intersections in Leadership. 3 Hours.
The objective of this course is to examine and evaluate leadership in and among people and their environment. Topics include intersectionality, multi-cultural leadership theories, and environmental sustainability. This course serves as an elective for both the Minor in Leadership Studies and Graduate Certificate in Leadership.

LDR 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice such as a tutor or assistant.

LDR 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

LDR 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

LDR 498. Honors. 1-3 Hours.
PR: Students in the Honors program and consent by the honors director. Independent reading, study or research.

LDR 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

LING 202. Global Englishes. 3 Hours.
Examination of historical, linguistic, and sociopolitical developments leading to the internalization of English and the subsequent emergence of new global Englishes. Exploration of debates around the role and status of English and how its spread has affected local languages. Perspectives from linguistics, sociolinguistics, postcolonial studies, and English language teaching will be adopted in the analysis of global Englishes.

LING 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

LING 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

LING 311. Introduction to Structural Linguistics. 3 Hours.
PR: ARBC 203 or CHIN 203 or CLAS 203 or FRCH 203 or GER 203 or ITAL 203 or JAPN 203 or PORT 203 or RUSS 203 or SPAN 203 or equivalent. Required of foreign language majors. A detailed examination of language structure (phonology, morphology, and syntax) and its relation to language use (sociolinguistics).

LING 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

LING 402. Structure of Modern French. 3 Hours.
PR: LING 311 and 18 hours of French or consent. Study of phonology, morphology, and syntax of modern French together with a contrastive analysis of French and English.

LING 411. Phonology. 3 Hours.
PR: LING 101 or LING 311. Description of sounds and sound systems in language. Articulatory phonetics. Structuralist and generative approaches to phonemics.

LING 412. Syntax. 3 Hours.
Emphasis on generative syntax in English, German, Romance and Slavic languages.

LING 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

LING 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

LING 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

LING 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

LING 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

LING 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

LING 496. Senior Thesis. 1-3 Hours.
PR: Consent.

LING 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

MAE 102. Introduction to Mechanical and Aerospace Engineering Design. 3 Hours.
PR: ENGR 101 with a minimum grade of C- and (MATH 154 or MATH 155 with a minimum grade of C-). Engineering problem solving techniques related to mechanical and aerospace engineering topics through teamwork, written and oral communications, and using the computer, for algorithm development and computer aided design. Discussion of engineering professional and ethical behavior.

MAE 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

MAE 202. Sophomore Seminar. 1 Hour.
Overview of aerospace engineering, mechanical engineering, robotics engineering, and/or materials science and engineering disciplines, capstone design experiences, and career pathways. Emphasis on providing guidance on available opportunities and options in the department's undergraduate programs.

MAE 211. Mechatronics. 2 Hours.
PR: CHE 102 or ENGR 102 or MAE 102 or (CS 110 and CS 110L) and (MATH 154 or MATH 155 with a minimum grade of C-) and PR or CONC: MAE 211L. Selection of mechanical and electronic components and integration of these components into complex systems. Hands-on laboratory and design experiments with components and measurement equipment used in the design of mechatronic products.

MAE 211L. Mechatronics Laboratory. 1 Hour.
PR: (CHE 102 or ENGR 102 or MAE 102 or (CS 110 and CS 110L)) and (MATH 154 or MATH 155 with a minimum grade of C-) and PR or CONC: MAE 211. Laboratory for MAE 211.

MAE 212L. Introduction to Computer Aided Design. 1 Hour.
PR: ENGR 101 with a minimum grade of C-. Introduction to the process of drawing and creating mechanical objects using a computer. Basics of engineering graphics and creation of computer-based models of components and assemblies.

MAE 215. Introduction to Aerospace Engineering. 3 Hours.
PR: (CHE 102 or ENGR 102 or MAE 102) and (MATH 154 or MATH 155 with a minimum grade of C-). Fundamental physical quantities of a flowing gas, standard atmosphere, basic aerodynamic equations, airfoil nomenclature, lift, drag and aircraft performance. Digital computer usage applied to aerodynamic and performance problems and aircraft design.

MAE 216L. Intermediate Engineering Computation. 1 Hour.
PR: (CHE 102 or ENGR 102 or MAE 102) with a minimum grade of C-. This course will use basic coding skills learned in ENGR 102 / MAE 102 / CHE 102 and apply them to intermediate complex coding problems. Students will learn to use of the software debugger to solve coding issues that arise in more complex routines. Students will work individually to solve intermediate difficult engineering-oriented problems.

MAE 241. Statics. 3 Hours.
PR: WVU sections require PHYS 111 and (MATH 154 or MATH 155) all with a minimum grade of C-, WVUIT sections require MATH 155 or (ENGR 156 and PR or CONC: MATH 155). Engineering applications of force equilibrium. Vector operations, couples and moments, resultants, centers of gravity and pressure, static friction, free-body diagrams, trusses and frames.

MAE 242. Dynamics. 3 Hours.
PR: WVU sections require MAE 241 and MATH 156 with a minimum grade of C- in each, WVUIT sections require MAE 241 and (MATH 156 or (ENGR 156 and PR or CONC: MATH 156)) and PR or CONC: PHYS 111. Newtonian dynamics of particles and rigid bodies. Engineering applications of equations of motion, work and energy, conservative forces, acceleration in several coordinate systems, relative motion, instantaneous centers, and plane motion.

MAE 243. Mechanics of Materials. 3 Hours.
PR: WVU sections require MAE 241 and MATH 156 with a minimum grade of C- in each, WVUIT sections require MAE 241 and (MATH 156 or (ENGR 156 and PR or CONC: MATH 156). Stress deformation, and failure of solid bodies under the action of forces. Internal force resultants, stress, strain, Mohr's circle, and mechanical properties of materials, generalized Hooke's law. Axial bending and buckling loads, and combinations.

MAE 244L. Dynamics and Strength Laboratory. 1 Hour.
PR or CONC: MAE 242 and MAE 243. Experiments in dynamic and strength of materials. Mechanical properties and stress- strain curves of materials for tension, compression, shear, and torsion. Hardness, fatigue, and fracture of metals. Vibration.

MAE 271S. Mechanical and Aerospace Engineering Design 1. 1 Hour.
PR: Consent. Hands-on applications of concepts learned in other courses to meet specified performance or competition criteria of capstone design courses. Introductory concepts of an integrated sophomore-junior-senior design team.

MAE 275S. Aerospace Design 1. 1 Hour.
PR: Consent. Hands-on applications of concepts learned in other courses to meet specified performance or competition criteria of aerospace capstone design courses. Introductory concepts of an integrated sophomore-junior-senior design team.

MAE 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MAE 298. Honors. 1-6 Hours.
PR: Students in the Honors Program and consent by the honors director. Independent reading, study, or research.

MAE 312. Introduction to Mechanical Design. 3 Hours.
Introduction to the process of designing mechanical objects and machines composed of multiple objects. Basics of engineering graphics, and creation of computer-based models of machine components and assemblies.

MAE 316. Analysis of Engineering Systems. 3 Hours.
PR: MATH 261 with a minimum grade of C- and (ENGR 102 or CHE 102 or MAE 102 or (CS 110 and CS 110L)) and MAE 242. Analytical, numerical, and computational techniques to analyze and solve engineering problems. Mathematical modeling, solution strategies, and analysis of results. Statistical techniques including probability distribution functions, regression analysis, and curve fitting.

MAE 320. Thermodynamics. 3 Hours.
PR: WVU sections require MATH 156 and PHYS 111 with a minimum grade of C- in each, WVUIT sections require MATH 156. Principles of thermodynamics; properties of ideal gases and vapors; first and second laws of thermodynamics; basic gas and vapor cycles; basic refrigeration.

MAE 321. Applied Thermodynamics. 3 Hours.
PR: WVU sections require MAE 320, WVUIT sections require MAE 320 and CHEM 115 and CHEM 115L. Applications to mechanical systems of fundamentals from thermodynamics; availability analysis; applied gas and vapor power cycles; applied refrigeration and psychrometry; mixtures of real gases and vapors; combustion; choked flow nozzles. (3 hr. lec.).

MAE 322L. Thermal and Fluids Laboratory. 1 Hour.
PR: MAE 320 and MAE 331. Experiments demonstrating fundamental concepts of thermal-fluid systems; hydrostatics, dynamic pressure forces, dimensional analysis, pipe pressure losses, drag on external bodies, flow measurements devices, engine performance, fan and turbine performance, saturated vapor curve determination.

MAE 331. Fluid Mechanics. 3 Hours.
PR: WVU sections require MAE 241 and MATH 251 with a minimum grade of C- in each, WVUIT sections require (MAE 242 or (CHE 212 and PHYS 111)) and MATH 156. Properties of fluids, fluid statics, inviscid fluid dynamics, fluid kinematics, thermodynamic principles, mass momentum and energy principles, similitude and dimensional analysis, laminar and turbulent flow, viscous effects, flow in pressure conduits and external flows.

MAE 335. Incompressible Aerodynamics. 3 Hours.
PR: MATH 251 with a minimum grade of C- and (MAE 215 or MAE 331). Dynamics of vector fluid flow fields. Ideal fluid flow. Introduction to viscous boundary layers. Airfoil Theory. Finite-wing theory.

MAE 336. Compressible Aerodynamics. 3 Hours.
PR: MAE 320 and (MAE 215 or MAE 331). Analysis and design of compressible, inviscid flows; isentropic flow, shock waves, Prandtl-Meyer expansions, supersonic nozzles and diffusers. Airfoils in compressible flow and small perturbation theory, introduction to hypersonic-flow theory.

MAE 342. Dynamics of Machines. 3 Hours.
PR: WVU sections require MAE 242 and PR or CONC: MATH 261, WVUIT sections require PR or CONC: MAE 242. Analysis of motion and forces in linkages and mechanisms. Synthesis of plane mechanisms, analysis of cams, gears and gear trains. Fundamentals of vibrations in machines. Analysis techniques include graphical, analytical and computational methods.

MAE 343. Intermediate Mechanics of Materials. 3 Hours.
PR: MATH 251 with a grade of C or better and MAE 243. Introduction to elasticity. Strength under combined stresses. Energy methods. Column theory. Unsymmetric bending. Fundamentals of fatigue and fracture.

MAE 345. Aerospace Structures. 3 Hours.
PR: MAE 343 or MAE 353. Torsion of thin-walled beams. Flexural shear flow. Thermal analysis of aerospace structures. Introduction to composite materials. Buckling of plates.

MAE 353. Intermediate Mechanics of Materials. 3 Hours.
PR: MAE 243 and (MATH 251 with a minimum grade of C-). Strength under combined stresses, failure methods, energy methods, column theory, unsymmetrical bending, composite materials, fundamentals of fatigue and fracture, and vibrations.

MAE 361. Introduction to Unmanned Aerial Systems. 3 Hours.
PR: MAE 215. Introduction to history, current domestic regulations, and policies on unmanned aerial systems. Vehicle aerodynamics, propulsion, structures, launch and recovery, mission planning, weapons and sensor payloads, and ground and airborne system data links. Use of numerical tools, computer-aided design tools, and common engineering planning tools.

MAE 365. Flight Dynamics. 3 Hours.
PR: MAE 242 and PR or CONC: MAE 335. Aircraft equations of motion. Modeling of aerodynamic forces and moments. Aircraft static and dynamic stability. Solution of equations of motion via Laplace transformation. Transfer functions. Simulation of open-loop aircraft dynamics. Aircraft handling qualities.

MAE 370. Aviation Ground School. 3 Hours.
Nomenclature of aircraft, aerodynamics, civil air regulations, navigation, meteorology, aircraft, and aircraft engines. May serve as preparation for private pilot written examinations. (Not approved as a technical elective.).

MAE 371S. Mechanical and Aerospace Engineering Design 2. 2 Hours.
PR: MAE 271S with a minimum grade of C-. Continued applications of concepts learned in other courses to meet specified performance or competition criteria of capstone design courses. Intermediate concepts of an integrated sophomore-junior-senior design team.

MAE 375S. Aerospace Design 2. 2 Hours.
PR: MAE 275S with a minimum grade of C-. Continued applications of concepts learned in other courses to meet specified performance or competition criteria of aerospace capstone design courses. Intermediate concepts of an integrated sophomore-junior-senior design team.

MAE 411. Advanced Mechatronics. 2 Hours.
PR: EE 221 and EE 221L and MAE 211 and (MATH 261 with a minimum grade of C-) and PR or CONC: MAE 411L. Instrumentation and measurements emphasizing systems that combine electronics and mechanical components with modern controls and microprocessors. First and second order behavior, transducers and intermediate devices, measurement of rapidly changing engineering parameters, microcontrollers and actuators.

MAE 411L. Advanced Mechatronics Laboratory. 1 Hour.
PR: EE 221 and EE 221L and MAE 211 and (MATH 261 with a minimum grade of C-) and PR or CONC: MAE 411. Laboratory for MAE 411.

MAE 412. Mobile Robotics. 3 Hours.
Introduction to fundamental topics in Mobile robotics; methods of locomotion; common mobile robot sensors, state estimation and navigation algorithms; path planning and obstacle avoidance methods; robot decision making and control processes; and mobile robot systems design.

MAE 413. Robotic Manipulators. 3 Hours.
PR: MATH 251 and (ENGR 102 or CHE 102 or MAE 102) and MAE 242 with a minimum grade of C- in all. Fundamentals of robotic manipulators including forward and inverse kinematics, mechanics, modeling, and control. Introduction to robot motion planning and robot programming. Applications of robotic manipulators.

MAE 415S. Balloon Satellite Project 1. 1 Hour.
Student teams propose, design, construct, and test experimental packages, launched as payloads via a weather balloon that is tracked and recovered. Data acquired by the experimental payloads is analyzed.

MAE 417S. Balloon Satellite Project 2. 2 Hours.
PR: MAE 415S. Student teams propose, design, construct, and test complex experimental packages, launched as payloads via a weather balloon that is tracked and recovered. Data acquired by the experimental payloads is analyzed.

MAE 422L. Energy Conversion Laboratory. 1 Hour.
PR: MAE 321 or MAE 426. Experiments demonstrating renewable and fossil-derived sources energy conversion including wind, solar, fuel cells, heat engines and refrigeration devices. Statistical analysis of data.

MAE 423. Heat Transfer. 3 Hours.
PR: WVU sections require MATH 261 with a minimum grade of C- and MAE 320 and (MAE 331 or MAE 335), WVUIT sections require (CHE 320 or PR or CONC: MAE 321) and MAE 331 and PR or CONC: MAE 419L. One-, two-, three-dimensional steady state conduction: transient conduction; free and forced convection; radiation; heat exchangers; heat and mass transfer by analytical, numerical analogical and experimental methods; design of thermal systems.

MAE 425. Internal Combustion Engines. 3 Hours.
PR: WVU sections require MAE 320, WVUIT sections require MAE 321. IC engine operating characteristics; engine cycles; thermochemistry and fuels; air and fuel induction; fluid motion within combustion chamber; combustion; exhaust flow; emissions and air pollution; heat transfer in engines; friction and lubrication; advanced engine concepts.

MAE 426. Flight Vehicle Propulsion. 3 Hours.
PR: MAE 336. Equilibrium combustion thermodynamics. Quasi one-dimensional flow with friction and total temperature change. Thermodynamics of aircraft engines. Aerodynamics of inlets, combustors, nozzles, compressors, and turbines. Performance of rockets. Ideal rocket analysis.

MAE 427. Heating, Ventilating, and Air Conditioning. 3 Hours.
PR: WVU sections require MAE 320 or consent, WVUIT sections require MAE 423.Air and humidity relations; comfort and indoor air quality; building heat transfer; design heating and cooling loads; air distribution; refrigeration; systems and equipment; system energy analysis; control systems.

MAE 430S. Microgravity Research 1. 3 Hours.
Student team conceives and proposes a unique research experiment, to be flown on NASA microgravity research aircraft. Team also begins design, construction, and testing of apparatus.

MAE 431S. Microgravity Research 2. 3 Hours.
PR: MAE 430S. Student team completes design, construction, and testing of research experiment; that is then flown on NASA microgravity research aircraft. Data required from experiment is analyzed and reported.

MAE 432. Engineering Acoustics. 3 Hours.
PR: MATH 261. Theory of sound propagation and transmission. Important industrial noise sources and sound measurement equipment. Selection of appropriate noise criteria and control methods. Noise abatement technology. Laboratory studies and case histories.

MAE 433. Computational Fluid Dynamics. 3 Hours.
PR: MAE 316 and (MAE 331 or MAE 335). Introduction to modern computational fluid dynamics. Development and implementation of finite- difference schemes for numerical flow solution. Grid Generation. Explicit, implicit, and iterative techniques. Emphasis on applications. Validation and verification of solution.

MAE 434. Experimental Aerodynamics. 2 Hours.
PR: MAE 336 and PR or CONC: MAE 434L. Aerodynamic testing and instrumentation. Supersonic and low-speed wind tunnel testing including shock waves, aerodynamic forces, pressure distribution on an airfoil and boundary layers. Application of schlieren optics, thermal anemometry and laser doppler velocimetry.

MAE 434L. Experimental Aerodynamics Laboratory. 1 Hour.
PR: MAE 336 and PR or CONC: MAE 434. Laboratory for MAE 434.

MAE 437. Vertical/Short Takeoff and Landing Aerodynamics. 3 Hours.
PR: MAE 336. Fundamental aerodynamics of V/STOL aircraft. Topics include propeller and rotor theory, helicopter performance, jet flaps, ducted fans, and propeller-wing combinations.

MAE 438. Introduction to Gas Dynamics. 3 Hours.
PR: MAE 331 or consent. Fundamentals of gas dynamics, one-dimensional gas dynamics and wave motion, measurement, effect of viscosity and conductivity, and concepts of gas kinetics. (3 hr. lec.).

MAE 439. Hypersonic Gas Dynamics. 3 Hours.
PR: MAE 336. Hypersonic shock and expansion wave relations; hypersonic inviscid flow fields: approximate and numerical methods, blast wave theory; hypersonic boundary layers and aerodynamic heating.

MAE 441. Gas Turbine Design and Durability. 3 Hours.
PR: MAE 320 and (MAE 335 or MAE 331). Design of gas turbine engines for aircraft propulsion and industrial power generation. Theory of operation and characteristics of gas turbines. Design considerations, component operation, and durability of the individual components.

MAE 442. Mechanical Vibrations. 3 Hours.
PR: WVU sections require MAE 316 and (MAE 343 or MAE 353), WVUIT sections require MAE 242 and MATH 261. Response analysis of one, two, and multi degree of freedom systems; natural frequencies and modes of vibrations; damping; methods to avoid excessive vibrations; whirling of rotating shafts; balancing; vibration isolation; vibration measurements; and instrumentation.

MAE 446. Mechanics of Composite Materials. 3 Hours.
PR: MAE 243 and MATH 251. Fundamental methods for structural analysis of fiber reinforced composites. Particularities of composite applications in design and manufacturing of structural components: performance tailoring, failure criteria, environmental effects, joining and processing.

MAE 447. Aeroelasticity. 3 Hours.
PR: MAE 345. Vibrating systems of single degree and multiple degrees of freedom, flutter theory and modes of vibration, torsional divergence and control reversal.

MAE 451. Professional Practice in Engineering. 1 Hour.
PR: MAE 241 and (MAE 242 or MAE 243) and (MAE 320 or MAE 331). Review of requirements for professional engineering licensure. Review of mechanical engineering topics and problem solving skills for the Fundamentals of Engineering exam required for NCEES Engineering in Training Certificate.

MAE 454. Machine Design and Manufacturing. 3 Hours.
PR: WVU sections require MATH 261 with a minimum grade of C- and MAE 342 and (MAE 343 or MAE 353), WVUIT sections require MAE 243 as a prerequisite and PR or CONC: MAE 342. Working stresses, theories of failure, fatigue, welded joints, design of machine elements such as shafting, screws, springs, belts, clutches, brakes, gears, bearings, and miscellaneous machine elements. Design for manufacturability considerations.

MAE 456. Computer-Aided Design and Finite Element Analysis. 2 Hours.
PR: WVU sections require MATH 261 with a minimum grade of C- and (MAE 343 or MAE 353) and (MAE 342 or PR or CONC: MAE 345) and PR or CONC: MAE 456L, WVUIT sections require MATH 251 and MAE 454 and MAE 455 and PR or CONC: MAE 456L. Computer aided design fundamentals and formulation of the stiffness matrix and load vector 1D and 2D elements based on variational principles. Analytical and finite element solution of vibration and heat transfer problems. Explore applications of CAD/FEM packages in design case studies.

MAE 456L. Computer-Aided Design and Finite Element Analysis Laboratory. 1 Hour.
PR: WVU sections require MATH 261 with a minimum grade of C- and (MAE 343 or MAE 353) and (MAE 342 or PR or CONC: MAE 345) and PR or CONC: MAE 456, WVUIT sections require MATH 251 and MAE 454 and MAE 455 and PR or CONC: MAE 456. Laboratory for MAE 456.

MAE 457. UAV Path Planning and Trajectory Tracking. 3 Hours.
PR: MAE 365 or MAE 466. Introduction to algorithms for unmanned aerial vehicle (UAV) path planning and trajectory tracking: development, implementation, and testing through simulation.

MAE 459. Hybrid Electric Vehicle Propulsion and Control. 3 Hours.
Hybrid electric vehicle propulsion system modeling and simulation. Hybrid electric vehicle powertrain architectures. Mathematical modeling of hybrid vehicle components including vehicle longitudinal dynamics, batteries, electric motors, engines, transmissions, inverters. Development of hybrid supervisory control algorithms for powertrain management and optimization.

MAE 460. Automatic Controls. 3 Hours.
PR: WVU sections require MATH 261 with a grade of C- or better, WVUIT sections require EE 221 and MATH 261. Modeling and simulation of mechanical systems using transfer functions. 1st and 2nd order systems with associated specification. Block algebra and concept of Equivalent Transfer Function. Steady state errors. Routh-Hurwitz criteria for stability. Root locus based design of proportional controllers and compensators. Introduction to state variables modeling.

MAE 465. Flight Mechanics 2. 3 Hours.
PR: MAE 365 or MAE 466. Fundamental concepts of feedback control system analysis and design. Automatic flight controls, and human pilot plus airframe considered as a closed loop system. Stability augmentation.

MAE 466. Spacecraft Dynamics. 3 Hours.
PR: MAE 316. Development of rigid-body equations of motion for aerospace vehicles. Introduction to spacecraft attitude representations, including direction cosine matrices, Euler angles, and quaternions. Brief discussion of airplane flight dynamics. Discussion of attitude dynamics, stabilization, and control in the presence of external torques. Brief discussion of attitude hardware.

MAE 467. Introduction to Flight Simulation. 3 Hours.
PR: MAE 365 or MAE 466. Fundamental concepts of flight simulation are introduced through interaction with tools of different complexity from simplified linear and non-linear models to a six degrees-of-freedom motion based flight simulator.

MAE 469. UAV Guidance, Navigation & Control. 3 Hours.
PR: MAE 365 or MAE 466. Introduction to multi-rotor unmanned aerial vehicle (UAV) dynamics. Basic filters for UAV state estimation. Introduction to UAV attitude stabilization and altitude holding controllers. Simplified UAV path planning algorithms.

MAE 471S. Principles of Engineering Design. 3 Hours.
PR: MAE 320 and MAE 331 and MAE 342 and (MAE 343 or MAE 353). Topics include design problems in mechanical engineering, deal with analytical and experimental methodologies in fluid, thermal, and structural areas, decision-making techniques, optimization, computer aided design and economic consideration.

MAE 472S. Engineering Systems Design. 3 Hours.
PR: MAE 320 and MAE 331 and MAE 342 and (MAE 343 or MAE 353). Identification and solution of challenging engineering problems through rational analysis and creative synthesis. Planning, designing, and reporting on complex systems on individual and group basis.

MAE 473. Bioengineering. 3 Hours.
PR: MAE 243. Introduction to human anatomy and physiology using an engineering systems approach. Gives the engineering student a basic understanding of the human system so that the student may include it as an integral part of the design.

MAE 474S. UAV Design/Build/Fly Comp. 1-3 Hours.
PR: Consent. Hands-on applications of concepts learned in other courses to meet specified flight performance and competition criteria. Advanced aerodynamic and materials concepts are utilized by an integrated sophomore-junior-senior team.

MAE 475S. Aircraft Design 1. 3 Hours.
PR: (ENGL 102 or ENGL 103) and MAE 215 and MAE 320 and (MAE 343 or MAE 353) and MAE 365 and MATH 261 with a minimum grade of C-. Design principles of aircraft or supporting systems. Addresses major components or subsystems of aircraft. Applications meet specified performance or competition criteria.

MAE 476. Space Flight and Systems. 3 Hours.
PR: MAE 316. Introduction to fundamental concepts of space flight and vehicles, emphasizing performance aspects and basic analytical expressions. Common analysis methods and design criteria for launch vehicles, orbital mechanics, atmospheric re-entry, stabilization, thermal, power, and attitude control.

MAE 478. Guided Missile Systems. 3 Hours.
PR: MAE 336. Design philosophy according to mission requirements. Preliminary configuration and design concepts. Aerodynamic effects on missiles during launch and flight. Ballistic missile trajectories. Stability determination by analog simulation. Performance determination by digital and analog simulation. Control, guidance, and propulsion systems. Operational reliability considerations.

MAE 482. Flight Simulation for Aircraft Safety. 3 Hours.
PR: MAE 365 or MAE 466. Introduction to flight modeling and simulation tools for aircraft health management through analysis and accommodation of abnormal flight conditions.

MAE 484. Spacecraft Propulsion. 3 Hours.
PR: MAE 336. Brief introduction to aircraft propulsion including turbojets. Introduction to rocket and spacecraft propulsion. The rocket equation, staging, liquid rocket engines and solid rocket motors, thermochemistry, and combustion.

MAE 485S. Aircraft Design 2. 3 Hours.
PR: ENGL 102 and MAE 215 and MAE 320 and (MAE 343 or MAE 353) and MAE 365 and MATH 261 with a minimum grade of C-. Realization of aircraft or supporting systems. Addresses major components or subsystems of aircraft. Evaluation through experiments or simulation. Applications meet specified performance or competition criteria.

MAE 486S. Spacecraft Design 1. 3 Hours.
PR: ENGL 102 and MAE 316 and MAE 336 and (MAE 343 or MAE 353). Design principles of space vehicles or supporting systems as implemented by government or industry. Addresses major subsystems found in modern space vehicles. Applications meet specified performance or competition criteria.

MAE 487S. Spacecraft Design 2. 3 Hours.
PR: (ENGL 102 or ENGL 103) and MAE 316 and MAE 336 and (MAE 343 or MAE 353). Realization of space vehicles or supporting systems. Addresses major subsystems found in modern space vehicles. Evaluation through experiments or simulation. Applications meet specified performance or competition criteria.

MAE 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

MAE 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

MAE 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MAE 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

MAE 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

MAE 496. Senior Thesis. 1-3 Hours.
PR: Consent.

MAE 497. Research. 1-6 Hours.
Independent research projects.

MAE 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

MANG 315. Cross-Cultural Communication. 3 Hours.
The primary objective of this course is to provide students with concepts and practical guidelines to understand how individuals, teams, and companies can communicate effectively in global and inter-cultural contexts.

MANG 330. Human Resource Management Fundamentals. 3 Hours.
This course provides future managers and future business professionals a contemporary understanding of Human Resource Management. The course begins by providing an overview of the modern workplace and the critical business and social issues affecting HR practitioners. The course introduces the concept of work design and job analysis, which is a foundation of all HR functions.

MANG 360. International Business. 3 Hours.
PR or CONC: BCOR 370. The course explores the cultural, economic, and political environments of business. Other topic include globalization, import and export, foreign direct investment, foreign currency exchange, regional economic cooperation, and the multinational enterprise.

MANG 422. Organizational Behavior. 3 Hours.
This course presents a broad overview of theories, research, and practices as they relate to understanding work-related attitudes and behaviors. Drawing upon ideas from both organizational science and industrial organizational (I/O) psychology, this course provides students with the knowledge necessary to understand their own and others' behaviors in the workplace.

MANG 426. Introduction to Decision Analysis. 3 Hours.
PR: (CS 101 or BCOR 121) and (ECON 225 or STAT 211) all with a minimum grade of C-. Developing and solving decision analysis models utilizing spreadsheets.

MANG 434. People Analytics. 3 Hours.
Students will study the foundations of scientific inquiry, ethical data practices, and the application of qualitative and quantitative research methods to synthesize and analyze workforce data. Through hands-on experience with measurement techniques, research design, analytical methods, data visualization, and AI-assisted reporting practices, students will develop the skills needed to leverage data insights for strategic HR decision-making.

MANG 480. Corporate Social Responsibility. 3 Hours.
PR: BCOR 370. Provides an overview of personal support and involvement in not-for-profit organizations in meeting community needs.

MANG 485. Global Strategic Issues. 3 Hours.
This managerially focused course provides an integrated, multifunctional approach on how managerial decision-making and firm strategy develop in global economic, political and social environments. Students are introduced to international strategic management and organizational issues in the context of current theory, research and practice.

MANG 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

MANG 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 6 hours). Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

MANG 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MANG 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

MANG 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

MANG 496. Senior Thesis. 1-3 Hours.
PR: Consent.

MANG 497. Research. 1-6 Hours.
Independent research projects.

MANG 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

MATH 121. Intro Concepts Of Mathematics. 3 Hours.
(Designed for non-science majors who do not need the techniques of mathematics for other course work in their programs.) Topics in modern mathematics.

MATH 122. Quantitative Skills and Reasoning. 3 Hours.
PR: Satisfactory placement through ACT/SAT or ALEKS. Introductory study of quantitative and reasoning skills needed for success in science, technology, engineering, and mathematics.

MATH 124. Algebra with Applications. 3 Hours.
PR: Minimum ACT/SAT math score, or satisfactory performance on departmental placement examination, or MATH 122 with a minimum grade of C-, (prerequisites may vary on regional campuses). Study of algebra with an emphasis on applications for science, business, technology, and social science. Topics include graphing and solving problems using linear, quadratic, square-root, logarithmic, and exponential functions, solving equations, performing operations on matrices.

MATH 126. College Algebra. 3 Hours.
PR: Satisfy the minimum ACT/SAT math score, or satisfactory performance on departmental placement examination, or MATH 122 with a minimum grade of C-, (prerequisites may vary on regional campuses). Introduces the foundations of analysis designed to precede the calculus sequence with emphasis on functions and graphs. Topics include properties of absolute value, polynomial, rational, exponential, logarithmic functions, and techniques for solving equations and inequalities.

MATH 128. Plane Trigonometry. 3 Hours.
PR: MATH 126 with a minimum grade of C-. Study of trigonometric functions, identities, vectors, complex numbers, and trigonometric equations. (Prerequisites may vary on regional campuses).

MATH 129. Pre-Calculus Mathematics. 4 Hours.
PR: Satisfy the minimum ACT/SAT math score, or satisfactory performance on departmental placement test, (prerequisites may vary on regional campuses). A treatment of algebra, analytic geometry, and trigonometry.

MATH 150. Applied Calculus. 3 Hours.
PR: Satisfy the minimum ACT/SAT math score, or satisfactory performance on departmental placement examination, or C- in MATH 124 or MATH 126 or MATH 129. For students in other disciplines needing calculus for applications.Limits of sequences and functions, continuity derivatives, and integrals of polynomials, rational functions, and exponential and logarithmic functions, partial derivatives, maxima and minima. Pre-requisite(s) and/or co-requisite(s) may differ on regional campuses.

MATH 151. Applied Calculus 2. 3 Hours.
PR: (MATH 150 or MATH 154 or MATH 155) with a minimum grade of C-. This course covers basic techniques of integration, applications of integration, Taylor polynomials, and an introduction to ordinary differential equations. Applications will be geared towards students in Engineering Technology.

MATH 153. Calculus 1a with Precalculus. 3 Hours.
PR: Satisfy the minimum ACT/SAT math score, or satisfactory performance on departmental placement examination, or C- in (MATH 126 and MATH 128) or in MATH 129. Introduction to limits, continuity, derivatives, and applications of derivative.

MATH 154. Calculus 1b with Precalculus. 3 Hours.
PR: MATH 153 with a minimum grade of C-. Introduction to applications of derivatives, antiderivatives, and definite integrals.

MATH 155. Calculus 1. 4 Hours.
PR: Satisfy the minimum ACT/SAT math score, or satisfactory performance on departmental placement examination, or minimum grade of C- in MATH 129 or MATH 153, or minimum grade of C- in both MATH 126 and MATH 128. Introduction to limits, continuity, derivatives, antiderivatives, definite integrals, and applications of the derivative.

MATH 156. Calculus 2. 4 Hours.
PR: A minimum grade of C- in MATH 154 or MATH 155. Techniques of integration, application of the definite integral, polar coordinates, indeterminate forms, and infinite series.

MATH 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

MATH 218. History of Mathematics. 3 Hours.
PR: MATH 155 with a minimum grade of C-. Development of mathematics through calculus, with emphasis on mathematical theories and techniques of each period and their historical evolution. (Not offered on a regular basis.).

MATH 232. Number and Algebra for Teachers. 3 Hours.
PR: A minimum grade of C- in MATH 124 or MATH 126 or MATH 150 or MATH 153 or MATH 155. (Open to pre- service elementary education majors only.) Use of properties of real numbers and algebra to illuminate conceptual understanding and enhance problem solving techniques. The use of technology is infused throughout the course.

MATH 233. Measurement and Geometry for Teachers. 3 Hours.
PR: MATH 232 with a minimum grade of C-. (Open to pre-service elementary education majors only.) Use of properties of real numbers, algebra, measurement and geometry to illuminate conceptual understanding and enhance problem solving techniques. The use of technology and manipulatives is infused throughout the course.

MATH 251. Multivariable Calculus. 4 Hours.
PR: MATH 156 with a minimum grade of C-. Introduction to solid analytic geometry, vector algebra, and calculus of several variables.

MATH 261. Elementary Differential Equations. 4 Hours.
PR: WVU and PSC sections require MATH 251 with a minimum grade of C-, WVUIT sections require MATH 251 with a minimum grade of C- or MATH 315 with a minimum grade of B-. Ordinary differential equations, Laplace transforms, partial differential equations, Fourier series, and applications.

MATH 293. Special Topics. 6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MATH 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

MATH 303. Introduction to the Concepts of Mathematics. 3 Hours.
PR: MATH 156 with a minimum grade of C- or consent. An introduction to mathematical thinking and writing, including the construction of proofs. Specific examples are drawn from elementary number theory, relations, calculus, and enumerative combinatorics.

MATH 318. Perspectives on Mathematics and Science. 3 Hours.
PR: MATH 150 or MATH 153 or MATH 155. This course explores knowledge generation in the sciences and mathematics by referencing the philosophy, history, and methods of those disciplines. It is designed to prepare future teachers with background, rationales, and strategies necessary to enhance student knowledge and interest in these areas, providing deeper understanding of the underlying mathematics in science, and of mathematics in general.

MATH 322. Introduction to Programming and Computational Mathematics. 3 Hours.
PR: MATH 156 with a minimum grade of C- and PR or CONC: MATH 251 with a minimum grade of C-. An introduction to programming and computation in the Matlab environment with applications to the mathematical sciences.

MATH 338. Geometry for Teachers. 3 Hours.
PR: MATH 156 with a minimum grade of C- and PR or CONC: MATH 303 with a minimum grade of C- or consent. Special topics from Euclidean and non-Euclidean geometries needed for teaching high school mathematics.

MATH 341. Introduction to Algebraic Structures. 3 Hours.
PR: MATH 303 with a minimum grade of C-. This course is designed to study fundamental algebraic structures such as groups, rings, and fields. We cover properties of integers, modular arithmetic, groups, permutation groups, subgroups, cyclic groups, cosets, Lagrange’s theorem, normal subgroups, quotient groups, homomorphism and isomorphism of groups, direct product of groups, structure of finite groups, and introduction to rings, integral domains, ideals, and fields.

MATH 343. Introduction to Linear Algebra. 3 Hours.
PR: MATH 156 with a minimum grade of C-. Introduction to vector spaces as an algebraic system. Emphasis on axiomatic development and linear transformation. Examples from geometry and calculus.

MATH 363. Mathematical Foundations of Actuarial Science. 3 Hours.
PR: MATH 156 with a minimum grade of C-. Concepts from calculus and probability as they pertain to actuarial sciences. The calculus portion covers limits, derivatives, integrals, power series and polar coordinates. The probability portion covers basic and conditional probability, Bayes' theorem, discrete and continuous variables and distributions, and bivariate distributions. Focus is on word problems of the type covered by the SOA/CAS Exam P/1.

MATH 364. Mathematics of Compound Interest. 3 Hours.
PR: MATH 156 or MATH 150. A problem-solving course focusing on the measurement of interest, annuities, amortization schedules, and sinking funds, and the valuation of bonds and other securities.

MATH 373. Introduction to Cryptography. 3 Hours.
PR: MATH 155. Introduces students to the art of confidential communication the mathematical background and the practical skills in making and breaking secret codes.

MATH 375. Applied Modern Algebra. 3 Hours.
PR: MATH 156 with a minimum grade of C-. Finite fields, algebraic coding theory, Boolean algebras, monoids, finite state, and Turing machines.

MATH 376. Foundations, Functions and Regression Models. 3 Hours.
PR or CONC: MATH 156. In-depth study of topics taught by teachers of secondary school mathematics. Emphasizes development of the concept of function, exploring function patterns in data sets, and connections between these topics and topics of mathematics associated with the secondary school curriculum. Integrates use of appropriate technology in developing lessons that help students master the concepts of functions, data, and real world applications.

MATH 377. Operations Research. 3 Hours.
PR: MATH 156. Linear programming, multi-objective optimization and goal programming, discrete dynamic programming, network flows, discrete optimization models and methods, nonlinear programming.

MATH 378. Discrete Mathematics. 3 Hours.
PR: WVU Morgantown sections require MATH 303, WVU Tech sections require MATH 156. Permutations, combinations, binominal theorem, inclusion-exclusion formula, recurrence relations, generating functions, elementary graph theory (connectivity, paths, circuits, trees, vertex and edge coloring, graph algorithms) matching theory, and discrete optimization.

MATH 381. Introduction to Analysis and Topology. 3 Hours.
PR: MATH 303 with a minimum grade of C-. Introduction to metric and topological spaces. Topics include: continuity, convergence, separation, compactness, and connectedness.

MATH 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MATH 420. Numerical Analysis 1. 3 Hours.
PR: MATH 251 and (CHE 102 or (CS 110 and CS 110L) or DSCI 221 or DSCI 222 or ENGR 102 or MAE 102 or MATH 322) with a minimum grade of C-. Computer arithmetic, roots of equations, interpolation, Gaussian elimination, numerical integration and differentiation. Numerical solution of initial value problems for ordinary differential equations. Least square approximations.

MATH 421. Numerical Analysis 2. 3 Hours.
PR: MATH 420 and (MATH 343 or MATH 441). Solutions of linear systems by direct and iterative methods. Calculation of eigenvalues, eigenvectors, and inverses of matrices. Applications to ordinary and partial differential equations.

MATH 441. Applied Linear Algebra. 3 Hours.
PR: MATH 156 with a minimum grade of C-. Methods and applications of linear algebra in various disciplines including mathematics, engineering, and science. Basic topics including linear equations, matrix algebra, determinants, vector spaces, subspaces, linear independence, basis and dimension, linear transformations, eigenvalues and eigenvectors, diagonalization, orthogonality of vectors, and projections, Cramer's rule, LU-factorization, Gram-Schmidt process, and the method of least squares.

MATH 442. Advanced Algebraic Structures. 3 Hours.
PR: MATH 341. Continuing study of groups, rings, and fields together with their substructures, quotients, and products. Morphisms with an emphasis on the fundamental homomorphism theorems.

MATH 451. Introduction to Real Analysis 1. 3 Hours.
PR: MATH 303 with a minimum grade of C-. The foundations of Calculus, with all its useful and sometimes even unexpected applications, Real Analysis is the branch of Mathematics which channels Algebra (study of structure) and Geometry (study of shape) together with the abstract notion of infinity. We cover basic topics including axiomatic theory of real numbers, sequences, limits, series of numbers, point set topology, continuity, and uniform continuity.

MATH 452. Introduction to Real Analysis 2. 3 Hours.
PR: MATH 451 with a minimum grade of C-. Rigorous study of the theory of functions of real variables. Covers basic topics including differentiation, Riemann integral, Riemann-Stieltjes integrals, power series, uniform convergence, improper integrals.

MATH 456. Complex Variables. 3 Hours.
PR: MATH 251 with a minimum grade of C-. Comprehensive introduction to complex analysis, emphasizing applications and examples that are useful in science and engineering. Covers basic topics including complex numbers, polar form, complex differentiable functions, Cauchy-Riemann equations, elementary analytic functions, mapping by elementary functions, complex integration, Cauchy’s integral theorem, maximum principle, harmonic functions, series, poles, and residues.

MATH 460. Introduction to Dynamical Systems and Applications. 3 Hours.
PR: MATH 261 with a minimum grade of C-. Introduction to the theory of dynamical systems, whose goal is to study the behavior of systems with known laws of evolution. Exploration of basic topics including fixed points, periodic orbits, linearization, local and global behavior of solutions, bifurcations, and chaos. Applications from biology, chemistry, and physics.

MATH 464. Mathematical Modeling. 3 Hours.
PR: (MATH 261 or consent) and (MAE 316 or STAT 215 or STAT 461 or consent) and (CHE 102 or DSCI 221 or DSCI 222 or ENGR 102 or MAE 102 or MATH 322 or (CS 110 and CS 110L)), all with a minimum grade of C-. Topics include growth and decay models, equilibrium models, optimal control and utility, and model validation. Applications from areas such as chemistry, physics, biology, economics, and the environment will be considered.

MATH 465. Partial Differential Equations. 3 Hours.
PR: MATH 261 with a minimum grade of C-. Introduces students in mathematics, engineering, and the sciences to methods of applied mathematics. First and second order equations, canonical forms, wave, heat, and Laplace's equations, and representation of solutions.

MATH 470. Introduction to Mathematical and Computational Systems Biology. 3 Hours.
PR: MATH 261 with a minimum grade of C- and PR or CONC: (MATH 343 or MATH 441) with a minimum grade of C-. Systems biology provides a framework to predict and control behaviors of large biochemical networks based on the analysis of its modules. Its methods apply to pharmacology, population dynamics, and epidemiology. Starting from concepts and computational implementation of biochemical kinetics, parameter fitting, sensitivity analysis, we develop principles for network control and analysis, with hands-on examples of metabolic, signaling, and genetic networks.

MATH 471. Mathematical Systems Biology 2: Stochastic Methods. 3 Hours.
PR: MATH 470 and STAT 215 with a minimum grade of C- in each or department permission. This second course in the sequence introduces students to stochastic models and simulation methods used in molecular systems biology. The core of the course deals with the application of probabilistic (stochastic) models to a class of biological processes, with emphasis on Monte-Carlo simulations of biochemical reactions inside cells. Students will learn to implement a variety of stochastic algorithms in Matlab.

MATH 473. Actuarial Mathematics 1. 3 Hours.
PR: MATH 156 with a minimum grade of C-. Introduction to modeling and actuarial modeling methods. Study of useful frequency and severity models, discussion the steps involved in the modeling process to solve business problems. Covers parts of CAS Exam 4/SOA Exam STAM (Short-Term Actuarial Mathematics).

MATH 474. Actuarial Mathematics 2. 3 Hours.
PR: MATH 156 with a minimum grade of C-. In this course, students will be introduced to useful credibility theory, insurance and reinsurance coverage, and pricing and reserving for short-term insurance coverages. This course covers parts of the learning objectives of Short-Term Actuarial Mathematics (STAM) Exam by the Society of Actuaries (SOA).

MATH 480. Capstone Design. 1 Hour.
Design of a research project in consultation with advisor(s). Practice of effective written and oral communication; engagement of students in purposeful writing in mathematics.

MATH 481. Capstone Experience. 2 Hours.
PR: MATH 480 with a minimum grade of C-. Implementation of research project in consultation with advisor(s). Practice of effective written and oral communication; engagement of students in purposeful writing in mathematics.

MATH 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

MATH 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

MATH 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MATH 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

MATH 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

MATH 496. Senior Thesis. 1-3 Hours.
PR: Consent.

MATH 497. Research. 1-6 Hours.
PR: Consent. Independent research projects.

MATH 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

MDIA 101. Media and Society. 3 Hours.
Examines the relationship between media, culture and society, with emphasis on the history, structure, and organization of the mass media.

MDIA 119. Reed School Multidisciplinary Orientation. 3 Hours.
PR: Admission into the College of Media MDS program. This course offers an orientation to the Reed College of Media's MDS program, including program requirements, departmental resources, curriculum options, student responsibilities and opportunities. This is a required course for the Reed College of Media B.A. Multidisciplinary Studies (MDS) program.

MDIA 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

MDIA 201. Digital & Social Media Literacy. 3 Hours.
This course teaches students to become perceptive news consumers and disseminators. It emphasizes critical thinking, recognition of bias, relevant history and practical strategies. Students will delve into distinctions of digital and social media messages, analyze forms of sourcing and explore the construction of credibility, bias and truth in the media that we use to build our view of the world.

MDIA 215S. Media Writing. 3 Hours.
PR: College of Media major or minor. Introduction to the fundamental reporting and storytelling skills that are the foundation of all media writing: print, radio, television, public relations, advertising and social media.

MDIA 225S. Media Tools & Applications. 3 Hours.
PR: Must be a College of Media major or Interactive Media Design minor. Intended for College of Media majors and Interactive Media Design minors, this lecture/lab course covers fundamental principles and practices of multimedia content gathering and editing in preparation for upper-level courses with the College of Media.

MDIA 245. Intro to Screenwriting. 3 Hours.
In this course, students will learn how skillful screenwriters create vivid characters, gripping conflict, strong dialogue and propulsive scenes.

MDIA 279. Introduction to Documentary Film. 3 Hours.
This course will introduce students to the history, theory and aesthetics of documentary filmmaking.

MDIA 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MDIA 320S. News and Sports Photography. 3 Hours.
PR: (ART 232S or MDIA 225S) with a minimum grade of C-. This course builds upon foundational photography skills, emphasizing advanced techniques for sports and journalistic storytelling. Students will refine their mastery of camera settings, composition and lighting to capture dynamic action, compelling portraits and meaningful narratives at events on campus and in the community.

MDIA 328. Media Ethics and Law. 3 Hours.
PR: (JRL 215 or MDIA 215 or MDIA 215S) with a minimum grade of C-. An in-depth exploration of the complex ethical and legal media landscape, with an emphasis on key historical precedents, new cases and challenges related to emerging technology, digital disinformation, artificial intelligence, new problems in social media and other current issues in journalism, public relations and advertising.

MDIA 340S. Creative Video Production. 3 Hours.
PR: MDIA 225S with a minimum grade of C-. Students in this course will learn advanced video shooting and editing techniques and gain video storytelling experience while using high-resolution cameras with interchangeable lenses. Students will learn about video planning, composition, lighting and shot sequencing. The course will introduce students to creative uses of technical settings and cinematic visual techniques.

MDIA 360S. Intro to Esports Production. 3 Hours.
This course will focus on team building and the basics of creating broadcast style content around an Esports event both in preproduction, formatting, and cultivating storylines for a gaming event(s).

MDIA 361. Media Relations In Sport. 3 Hours.
PR: ADV 201 or ADPR 215 or ADV 215 or JRL 215 or MDIA 215 or MDIA 215S or PR 215 or STCM 215 with a minimum grade of C-. Provides an in-depth understanding of how effective public relations plays an integral role in any sports organization via a myriad of communication efforts used in the dissemination of information to the media and the public.

MDIA 401. Making Media in the Digital Age. 3 Hours.
PR: MDIA 215S with a minimum grade of C-. Course builds understanding of media literacy based on current research and teaches discerning fact from fiction in media and creating meaningful media messages.

MDIA 427. History of American Journalism, Media & Pop Culture. 3 Hours.
PR: JRL 101 or MDIA 101 with a minimum grade of C-. This course examines the globally situated history and development of American journalism, media, and popular culture from the colonial period to today.

MDIA 438. Branded Content and Narrative. 3 Hours.
PR: (JRL 101 or MDIA 101) and (ADV 201 or ADPR 215 or ADV 215 or PR 215 or STCM 215) with a minimum grade of C- in each. This course provides an introduction into how the role of content is evolving in the modern marketing communications landscape and how to apply different types of content generation to new and traditional channels. Additional topics cover the pros and cons of content marketing vs. traditional marketing communication strategies.

MDIA 441. Internship. 1-3 Hours.
PR: (JRL 101 or MDIA 101) and (JRL 215 or MDIA 215 or MDIA 215S) and (JRL 225 or MDIA 225 or MDIA 225S) with a minimum grade of C- in each. Students complete approved internships that provide exposure to the media industry and to the different professional roles and opportunities within this diverse industry.

MDIA 442. Internship. 1-3 Hours.
PR: MDIA 101 and MDIA 215S and MDIA 225S with minimum grade of C- in each. Students complete approved internships that provide exposure to the media industry and to the different professional roles and opportunities within this diverse industry. Graded as a pass/fail course.

MDIA 445S. Advanced Screenwriting. 3 Hours.
PR: MDIA 245 with a minimum grade of C-. Students will develop and write their own screenplays using the skills and concepts examined in the Introduction to Screenwriting course.

MDIA 455. Media, Identity, and Power. 3 Hours.
This course explores the interrelated issues of media, identity, and power through various theoretical, historical, and ethical approaches.

MDIA 460S. Advanced Esports Production. 3 Hours.
PR: MDIA 360S with a minimum grade of C-. This advanced course focuses on live and pre-produced video content production for Esports events.

MDIA 485S. Reed School Multidisciplinary Capstone. 3 Hours.
PR: JRL 119 or MDIA 119 with a minimum grade of C- and College of Media MDS Major and departmental approval. Instructs students on the methods and advantages of multidisciplinary education. Includes an experimental project with real world relevance.

MDIA 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice such as a tutor or assistant.

MDIA 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

MDIA 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

MDIA 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MDIA 495. Independent Study. 1-3 Hours.
Faculty-supervised study of topics not available through regular course offerings.

MDIA 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

MDS 101. Introduction to Multidisciplinary Studies. 3 Hours.
Introduces students to the field of multidisciplinary studies. Informs students about departmental resources and launches the degree design process.

MDS 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

MDS 199. Orientation to MDS. 1-2 Hours.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities and opportunities.

MDS 279. Multidisciplinary Theories and Methods. 3 Hours.
PR or CONC: MDS 101 with a minimum grade of C-. Exposes students to important concepts, theoretical paradigms, and research methods of multidisciplinary studies. Students practice the skill of integrating different fields of knowledge.

MDS 289. Foundations of Integrated Studies. 3 Hours.
Introduces students to integrated studies as an academic discipline with its own terminology, research methods, and tools applicable to addressing complex 21st century problems.

MDS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MDS 301. Integrative Writing. 3 Hours.
Development of the writing process and portfolio generation, adapted for three contexts: gaining course credit through RBA portfolio review, preparing for graduate school, and preparing for the job market.

MDS 302. Portfolio Development. 3 Hours.
PR: MDS 301 with a minimum grade of C-. Centers on guiding students through the learning and writing processes grounded in the synthesis of their studies and work experience. Highlights the importance of integrative and applied learning and of effective self-reflection and argumentation. After completing the course, students will submit a portfolio to the appropriate unit to earn credit.

MDS 303. Independent Portfolio Development. 1 Hour.
PR: MDS 301 with a minimum grade of C-. Self-guided development of an equivalency-credit portfolio with the instructor's support. Centers on learning and writing grounded in the synthesis of studies and work experience in the one-on-one format. Highlights the importance of integrative and applied learning and effective self-reflection and argumentation. After completing the course, the student will submit the portfolio to the appropriate unit to earn credit.

MDS 304. People vs. the Planet: Interdisciplinary Approaches to Climate Change. 3 Hours.
Investigates the issue of climate change through an interdisciplinary approach defined as the Environmental Humanities. Students will employ critical thinking, research, and presentation skills culminating in a community-based action project with a local non-profit or university-based organization.

MDS 306. Medicine and the Arts. 3 Hours.
PR: ENGL 102 with a minimum grade of C-. In Medicine and the Arts, students will learn to make connections between artistic production and the health sciences, examining the historical, linguistic, cultural and aesthetic contexts in which we engage in and with healthcare. Students will employ critical analysis and practical skills in the course. They will analyze works of art with mindfulness to modern life and healthcare.

MDS 308. Women and Terrorism. 3 Hours.
Comprehensive, interdisciplinary explorations of women’s involvement in terrorism and counterterrorism. Engaging with the material from various disciplines and examining the roles that personal, social, and global factors play in women’s decisions to join terrorist organizations as well as counterterrorist projects, the course enables students to critically engage with the public discourse on this complex problem.

MDS 310. Approaches to Happiness. 3 Hours.
Exploration of happiness through an interdisciplinary lens; encourages constructive approaches to well-being. Engaging with materials from multiple disciplines, examining different theories on and methods of increasing happiness, analyzing happiness myths and models from popular culture, and applying the knowledge gained in class to their personal contexts, students get to know themselves better and start their own happiness portfolios.

MDS 311. RBA Professional Development. 1 Hour.
Development and enhancement of academic and professional skills beneficial to RBA students; customization of the RBA degree according to student needs and goals; creation of a learning e-portfolio.

MDS 312. Sports and Global Culture. 3 Hours.
Explores the influence of sports on global culture, taking into consideration race, religion, nationality, gender, and politics, in amateur, college, and professional sports. Emphasis on how professional athletes use their status to influence others and guide public debate of national and international issues.

MDS 316. Approaches to Identity: Who Am I?. 3 Hours.
Explores the notion of identity, borrowing from various disciplines. Enables students to go beyond visible signifiers to examine how identity is shaped by environment, empowering them to question and scrutinize models of identity prescribed by others.

MDS 320. Ethics, Technology and Artificial Intelligence. 3 Hours.
Examinations of artificial intelligence using the ethical framework from UNESCO's Recommendations on the Ethics of Artificial Intelligence, grounded in the Universal Declaration of Human Rights. Multidisciplinary explorations of topics such as the value-embedded nature of technology, machine learning biases, AI and environment, AI and misinformation, AI and cognitive liberty, legal issues involving AI, and ways to move forward.

MDS 322. Video Games & Human Rights. 3 Hours.
Examines human rights as defined in the Universal Declaration of Human rights and other UN documents and places them in the context of contemporary video games.Exploration of whether video games can educate us about human rights and to what extent video games and those who create them endorse or devalue human rights.

MDS 324. The Problem of Waste: Local Action & Global Impact. 3 Hours.
The course explores global outcomes of our local consumption choices, particularly focusing on where our everyday objects come from and where they go after we dispose of them. The course also examines alternative models of production and consumption of these items and the value-embedded nature of our technologies.

MDS 389. Interdisciplinary Research Methods. 3 Hours.
PR: MDS 199. Instructs students to approach research from an interdisciplinary perspective. Students will develop skill in applying methodologies and principles from more than one academic discipline to frame perspectives and conduct research. The final research project will address a political, economic, social, scientific, or humanitarian issue with relevance to the student's post-graduate career or academic aspirations using interdisciplinary tools and analysis.

MDS 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MDS 401. Capstone. 3 Hours.
PR or CONC: MDS 301. Incorporates academic, intellectual, and professional skills to complete a final project for the Bachelor of Integrated Studies. Focus is on oral communication skills, presentation skills, research skills, analysis, reasoning, resilience, collaboration, self-promotion, professional development, and lifelong learning.

MDS 411. RBA Capstone. 1 Hour.
PR: MDS 311. Preparation for professional life upon graduation; self-assessment of implementation of core personality strengths; career exploration with assistance from Career Services; development of job application and grad school admission documents; mock interview; completion of a learning e-portfolio.

MDS 489. Capstone. 3 Hours.
PR: WVU sections require PR or CONC: MDS 101 with a minimum grade of C-, WVUIT sections require MDS 199 with a minimum grade of C-. The MDS capstone instructs students on the methods and advantages of a multidisciplinary education. The capstone includes a research project, an experiential education project, professional preparation projects, and a complete e-portfolio that demonstrates student growth throughout their progress towards the degree.

MDS 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

MDS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

MDS 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

MDS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MDS 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

MDS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

MDS 496. Senior Thesis. 1-3 Hours.
PR: Consent.

MDS 497. Research. 1-6 Hours.
Independent research projects.

MDS 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

MICB 200. Medical Microbiology. 3 Hours.
PR: (CHEM 111 and CHEM 112) or (CHEM 115 and CHEM 116). Provides basic background in medical microbiology. Emphasis is on basic structure of all microorganism groups including bacteria, fungi, viruses, protozoa and helminths; epidemiology, immunology, and infectious disease.

MICB 201. Medical Microbiology for Clinical Nursing. 2 Hours.
PR: (CHEM 111 and CHEM 111L and CHEM 112 and CHEM 112L) or (CHEM 115 and CHEM 115L and CHEM 116 and CHEM 116L) with a minimum grade of C- in all. Basic microbiology for nursing students emphasizing pathogenic bacteria, viruses, fungi, and protozoans; functions of the innate and adaptive immune response in preventing disease, and survey of microorganisms pathogenic to humans. Lab simulations and assignments cover: basic, genetic, and immunological laboratory methods for identifying various microorganisms and infection control of these organisms.

MICB 201L. Medical Microbiology for Clinical Nursing Laboratory. 1 Hour.
PR: (CHEM 111 and CHEM 111L and CHEM 112 and CHEM 112L) or (CHEM 115 and CHEM 115L and CHEM 116 and CHEM 116L) with a minimum grade of C- in all. Basic microbiology for nursing students emphasizing pathogenic bacteria, viruses, fungi, and protozoans; functions of the innate and adaptive immune response in preventing disease, and survey of microorganisms pathogenic to humans. Lab simulations and assignments cover: basic, genetic, and immunological laboratory methods for identifying various microorganisms and infection control of these organisms.

MICB 323L. Medical Microbiology Laboratory. 1 Hour.
PR or CONC: MICB 200 with a minimum grade of C-. Laboratory exercises on the study of pathogenic microorganisms and clinical laboratory techniques.

MICB 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MICB 492. Directed Study. 1-3 Hours.
Directed study, readings, and/or research.

MICB 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MICB 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

MICB 497. Research. 1-6 Hours.
Independent research projects.

MILS 101. Military Science. 2 Hours.
The organization and development of the U.S. Army and ROTC from its inception to the present. The structure and role of the U.S. defense establishment with emphasis on the broad range of America civil-military relations.

MILS 102. Military Science. 2 Hours.

MILS 191. First-Year Seminar. 3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

MILS 201. Military Science. 2 Hours.
Introduction to basic leadership and management with emphasis on the fundamental concepts and skills required of today's citizen-soldier.

MILS 202. Military Science. 2 Hours.
Continued instruction in basic fundamentals of leadership and management, with emphasis on the military application of these fundamentals. Introduction to small unit tactics and organization.

MILS 301. Military Science. 3 Hours.
PR: Basic course or equivalent. (Equivalent credit may be granted by the WVU Director of Admissions and the professor of military science on the basis of prior military services, or ROTC training other than courses in military science taken at WVU.) Examines the requirements for military training and the psychological and technical aspects of effective instruction.

MILS 302. Military Science. 3 Hours.

MILS 401. Military Science. 3 Hours.
PR: MILS 301 and MILS 302 or consent. Stresses the responsibilities of an officer and affords leadership experience as a cadet leader. Military staff procedures, military law, and military organizations, which prepare the student for future services, are studied.

MILS 402. Military Science. 3 Hours.
PR: MILS 401 or consent. Advanced leadership techniques, unit operations, and personnel management problems are discussed in seminars. The military role in United States foreign policy and world affairs is examined.

MILS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MILS 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

MILS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

MINE 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

MINE 201. Mine Surveying. 2 Hours.
PR: MATH 154 or MATH 155 with a minimum grade of C- and PR or CONC: MINE 201L. Principles of surveying, field experience in underground and surface surveying with map work and calculations.

MINE 201L. Mine Surveying Laboratory. 1 Hour.
PR: (MATH 154 or MATH 155) with a minimum grade of C- and PR or CONC: MINE 201. Laboratory for MINE 201.

MINE 205. Underground Mining Systems. 3 Hours.
PR or CONC: SUST 101. Underground mining methods and equipment for bedded deposits and ore bodies; description and selection of mining methods, equipment requirements and selection, equipment design, and operational analysis.

MINE 206. Surface Mining Systems. 4 Hours.
PR or CONC: SUST 101. Surface mining methods, surface mining equipment, explosives and blasting design fundamentals, and slope stability.

MINE 261. Engineering Computer Aided Design. 2 Hours.
PR: ENGR 102. Engineering CAD concepts and techniques; implementing applications of engineering computer aided design for engineering graphics and plant design; introduction of geometry and calculation of engineering works.

MINE 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MINE 304. Aggregates Production. 3 Hours.
PR: MINE 206. Use of aggregates (stone, sand and gravel) in modern society; mine design for aggregates deposits; extraction and processing principles; transportation and distribution systems; environmental and safety concerns in aggregates production.

MINE 306. Mineral Property Evaluation. 3 Hours.
PR or CONC: STAT 211 or STAT 215 or IENG 213. Mineral exploration and reserve estimation, risk management, and engineering economy concepts applied to mineral deposits, including, depreciation and depletion.

MINE 331. Mine Ventilation. 3 Hours.
PR: MINE 205 with a minimum grade of C- and PR or CONC: MAE 331 or CE 321. Engineering principles, purposes, methods, and equipment applied to the underground environmental control including ventilation, illumination, and dust and noise control.

MINE 382. Mine Power Systems. 3 Hours.
PR:PHYS 112 and MINE 205 and MINE 206 or consent. Comprehensive study of mine electrical power systems from theory to practice, covering the vital aspects that go into planning and designing a mine power system.

MINE 386. Mine Equipment Maintenance. 3 Hours.
PR: MINE 205 and MINE 206 and MAE 242 and PR or CONC: MAE 243 with a minimum grade of C- in each. Provides an introduction to maintenance functions at mining operations, applying reliability theory to both preventative and predictive maintenance. Common failure modes and mitigation strategies are analyzed for components of haulage equipment and shaft-powered machinery including belts, fans, pumps, and conveyors. Applications of non-destructive testing to forecast typical causes of mine equipment failure and degradation, including corrosion.

MINE 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MINE 407. Longwall Mining. 3 Hours.
PR: MINE 205. Elements of longwall mining including panel layout and design considerations, strata mechanics, powered supports, coal cutting by shearer or plow, conveyor transportation, and face move.

MINE 411. Rock Mechanics/Ground Control. 3 Hours.
PR: MAE 243 and MINE 205 and MINE 206 and PR or CONC: GEOL 342 and MINE 411L. Rock properties and behavior, in-situ stress field, mine layout and geological effects; design of entry, pillar, and bolt systems, convergence and stress measurements, surface subsidence, roof control plan, slope stability, and laboratory sessions.

MINE 411L. Rock Mechanics/Ground Control Laboratory. 1 Hour.
PR: MAE 243 and MINE 205 and MINE 206 and PR or CONC: GEOL 342 and MINE 411. Laboratory for MINE 411.

MINE 425. Mineral Processing. 3 Hours.
PR: CHEM 115 and MATH 261 and PR or CONC: MINE 425L. Principles of physical and introductory chemical separation methods for concentration of non-mental and metal from minerals and ores. Unit operations include, communication, classification, gravity, electrostatic and magnetic separation, flotation, filtration, and thickening.

MINE 425L. Mineral Processing Laboratory. 1 Hour.
PR: CHEM 115 and MATH 261 and PR or CONC: MINE 425. Laboratory for MINE 425.

MINE 427. Coal Preparation. 3 Hours.
PR: CHEM 115 and CHEM 115L and MATH 251 and MINE 261 and PR or CONC: MINE 427L. Coal formation and characteristics; principles of coal beneficiation, washability analysis; colloid characteristics and flotation, unit operations for concentration, flotation, dewatering, material handlings, and mass balances.

MINE 427L. Coal Preparation Laboratory. 1 Hour.
PR: CHEM 115 and MATH 251 and MINE 261 and PR or CONC: MINE 427. Laboratory for MINE 427.

MINE 441. Mining Environmental Management. 3 Hours.
PR: CHEM 115 and CHEM 115L and ENGR 102 and MATH 251 with a minimum grade of C- in each. This course covers environmental pollution control as it applies to surface and underground mining systems. General areas of study will include environmental ethical considerations, stakeholder evaluation, mine permitting, and environmental law. Students will also learn the engineering principles of several environmental monitoring and pollution control activities, including material balance calculations, soil management, hydrologic evaluation, fine waste disposal, and remediation.

MINE 451. Mining Industry Business Practices. 3 Hours.
PR: MINE 306 and MATH 261 and STAT 215 with a minimum grade of C- in all. This course provides an engineering perspective on mining finance, business decision making, time value of money, mineral taxation, economic evaluation utilizing depreciation, depletion, and discounted cashflow concepts, social and economic significance of mineral resources, debt financing, equity, and other key business activities in the mining sector.

MINE 461. Applied Mineral Computer Methods. 3 Hours.
PR: MATH 251 with a grade of C or better. Problem solving in mineral processing, mineral resources, mining, and petroleum engineering. Emphasis on applications using various computing technologies.

MINE 471. Mine and Safety Management. 3 Hours.
PR: MINE 205 and MINE 206, and (STAT 211 or STAT 215 or IENG 213). Application of established management theories and statistical quality control to mining operations, Federal and state regulations, employee and contractor relations, loss prevention, industrial hygiene, legal considerations, engineering ethics.

MINE 472S. Mine Rescue and Emergency Response. 3 Hours.
PR: MINE 205. Prepare for the challenges of emergency response decision making and mine rescue skills. Develop leadership characteristics for modern mine management, develop communication capabilities, problem solve, and expand knowledge to effectively handle challenges of mine emergencies while protecting human life and material assets.

MINE 483S. Mine Design-Exploration Mapping. 3 Hours.
PR: MINE 261 with a minimum grade of C- in each and PR or CONC: MINE 306 and (MINE 425 or MINE 427) with a minimum grade of C- in each. This course is the first course of two in the senior capstone sequence. A mineral deposit is selected by the student and instructor. Geologic, demographic, quality, resource, and market data are integrated with geologic modeling software to develop a comprehensive exploration report. This report is used in the second course, MINE 484, to develop a mining pre-feasibility study.

MINE 484. Mine Design-Report Capstone. 4 Hours.
PR: MINE 483 or MINE 483S. Capstone mine design project report and presentation based on the mineral or coal reserve characterized in MINE 483S. Includes an integrated mine plan, schedule, equipment selection, processing plant, mine services, product description and engineering economics.

MINE 488. Mine Control Systems Engineering. 3 Hours.
PR: MINE 382 with a minimum grade of C-. Provides foundation in control systems for extraction and processing industry, introducing classic control theory, mathematical analysis of second-order system response and stability, PID controller design and implementation, and selection and application of field sensors. Course project requires complete design of PLC-based control system adapted from an actual mining operation, including wiring, programming, and documentation.

MINE 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

MINE 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

MINE 492. Directed Study. 1-3 Hours.
Directed study, reading and/or research.

MINE 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MINE 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

MINE 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

MINE 496. Senior Thesis. 1-3 Hours.
PR: Consent.

MINE 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

MIST 320. Managing Information Technology. 3 Hours.
This course provides student with an understanding of how information systems are used in business and how they impact (positively or negatively) the competitive position of organizations.

MIST 351. Database Management Systems. 3 Hours.
Introduction to database theory, design, implementation, management, and models; development of database applications for management systems.

MIST 352. Business Application Programming. 3 Hours.
PR or CONC: MIST 351. Provides an understanding of fundamental programming concepts required to develop end-user business applications in an object-oriented, event-driven environment. These skills will be utilized in the systems design and development course. Credit cannot be earned for this class and CS 110.

MIST 353. Advanced Information Technology. 3 Hours.
PR: (CS 110 or MIST 352) with a minimum grade of C-. Presents students with a fundamental knowledge of hardware and software technologies, including emerging technologies, focusing on the functionality and management of the technology in a business organization.

MIST 355. Data Communications. 3 Hours.
Provides an overview of the TCP/IP model and related technologies of the data communications corporate infrastructure as well as a survey of the essential tools and strategies for the effective management of business networks.

MIST 356. Network Security. 3 Hours.
PR or CONC: MIST 355. This course focuses on the managerial and technical aspects of information security in networks. The course covers security issues in informations systems, information assurance management and policy, network security planning, technologies, implementation, and security strategy.

MIST 400. Advanced Information Security. 3 Hours.
PR: MIST 355 with a minimum grade of C- and PR or CONC: MIST 356 with a minimum grade of C-. This course will provide students with advanced knowledge on offensive security and penetration testing topics from a technical and management perspective. This is a highly technical course that will provide students with hands-on knowledge of a multitude of common penetration testing techniques and tools, as well as broad knowledge about offensive security from a business and information security management perspective.

MIST 450. Systems Analysis. 3 Hours.
PR: MIST 320 and MIST 351 and (CS 110 or MIST 352) with a minimum grade of C- in each. Emphasizes the systems approach, concentrating on the first half of the systems development cycle: feasibility studies, cost/benefit analysis, organizational analysis, assessment of information needs, and project planning. Effective teamwork and communication are stressed.

MIST 452. Systems Design and Development. 3 Hours.
PR: MIST 353 and MIST 450. Follows the systems analysis course with the second half of the system development cycle; user interface design, data design, process design, system specifications, use of software development tools, documentation, testing, conversion, and maintenance.

MIST 460. Requirements Analysis and Design of Machine Learning and AI Based Systems. 3 Hours.
PR: MIST 352 with a minimum grade of C-. This course explores the application of Artificial Intelligence (AI) and Machine Learning (ML) in business contexts. Students will assess requirements, design strategies for integrating AI/ML systems into organizational workflows and information systems, develop system designs that align with business objectives, and critically evaluate the ethical and societal implications of AI/ML adoption in business.

MIST 462. Development and Deployment of Machine Learning and AI Based Systems. 3 Hours.
PR: BUDA 460 and MIST 460 with a minimum grade of C- in both. This course will equip students with the skills to develop, deploy, and manage scalable AI/ML systems in production environments using containerization and MLOps principles. Students will gain practical experience in building end-to-end pipelines, ensuring system scalability, and monitoring ethical and operational performance.

MIST 491. Professional Field Experience. 1-18 Hours.
PR: Consent (May be repeated up to a maximum of 6 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

MIST 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MIST 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

MKTG 315. Buyer Behavior. 3 Hours.
PR: BCOR 350 with a minimum grade of C-. The buyer decision process in a marketing framework. Emphasis on psychological and sociological concepts which influence the decision process.

MKTG 320. Professional Selling 1. 3 Hours.
PR: BCOR 350 with a minimum grade of C-. Deals with interpersonal communication, influencing, and persuasion processes designed to satisfy customer and company needs; stresses the structure of sound sales presentations through lectures, persuasive presentations, and appraisal and correction of common selling errors.

MKTG 321. Professional Selling 2. 3 Hours.
PR: MKTG 320 with a minimum grade of C-. Advanced instruction and skills development in interpersonal communication, prospecting, negotiation, and team selling. Preparation for excellence in the areas of career management and personal productivity.

MKTG 325. Marketing Research. 3 Hours.
PR: BCOR 350 or SM 322 with a minimum grade of C-. Scientific approach to the solution of marketing problems with emphasis on research methods and techniques.

MKTG 330. Distribution Channels. 3 Hours.
PR: BCOR 350 with a grade of C- or higher. Management of channel systems with emphasis on retail distribution, channel choice, strategies, control, and optimization within the context of role, power, conflict, and communications.

MKTG 345. Selling with Digital Media. 3 Hours.
PR: BCOR 350 with a grade of C- or higher. Exploration of how emerging forms of digital media such as social networking, and/or blogs can advance or hinder personal selling and marketing in the 21st century.

MKTG 350. Product and Brand Management. 3 Hours.
PR: BCOR 350 with a minimum grade of C-. Throughout the semester, you will be exposed to the concepts and terminology of product management. After taking the course, whether or not you intend to specialize in this area, you should have a greater appreciation for the role of product management in the field of marketing and within the organization.

MKTG 380. Integrated Promotions. 3 Hours.
PR: BCOR 350 with a grade of C- or higher. Marketing promotions can dramatically influence the relative success of firms and their brands. As such, we seek to understand the processes and approaches that organizations use in developing and sustaining effective promotional strategies.

MKTG 389. Online Analytics. 3 Hours.
PR or CONC: BCOR 350 with a minimum grade of C-. Basic marketing and statistical concepts relating to online marketing tools/platforms such as websites, email marketing, search engine marketing and social media. Students will be able to evaluate and use a diverse range of online platforms.

MKTG 410. Retail Management. 3 Hours.
PR: BCOR 350 and MKTG 315 with a grade of C- or higher in each. The organization and operating environment of retail firms. Special emphasis placed on consumer market segmentation and the marketing variables of merchandise mix, effective pricing, store location, and communication with suppliers and consumers.

MKTG 415. Customer Relationship Marketing. 3 Hours.
PR: BCOR 350 with a minimum grade of C-. An overview of customer relationship marketing (CRM) and CRM software and strategies to improve marketing effectiveness and efficiency covering one-on-one marketing, customer relationships, and managing internal and external quality to maximize customer satisfaction and firm profitability. Significant attention will be given the developing ethical and legal strategies. No technological background presumed.

MKTG 420. Sales Management. 3 Hours.
PR: MKTG 320 with a grade of C- or higher. Concentrates on the managerial responsibilities of sales manager for directing, motivating, and controlling a sales force plus the techniques of selling, including objections and closing.

MKTG 421. Sales Lab. 3 Hours.
This course focuses on interpersonal communication between buyers and sellers, specific mechanics, methods, and intricacies of the selling process, as well as effective sales presentation techniques. Extensive practice and exposure to sales and sales concepts, problems and techniques in a variety of selling situations will be emphasized.

MKTG 425. Environmental and Social Issues in Marketing. 3 Hours.
PR: BCOR 350 with a minimum grade of C-. Explores current environmental strategies focusing on reaching organizational goals and sustainable performance through marketing theory and practice.

MKTG 426. Sustainability Strategy. 3 Hours.
PR: BCOR 350 with a minimum grade of C-. Using simulations and current theory, students will gain hands-on experience that will allow them to better understand the complexity of sustainable strategies and meeting stakeholder needs.

MKTG 435. Artificial Intelligence and Its Application in Marketing. 3 Hours.
PR: BCOR 350 with a minimum grade of C-. This course provides an overview of artificial intelligence (AI) and how marketers utilize AI technologies to improve marketing effectiveness and efficiency. This course covers the role of facial recognition, machine learning and natural language processing in marketing. It is team taught with an outside practitioner; does not presume a technological background. Students will focus on the managerial implications of AI.

MKTG 440. Export Management. 3 Hours.
PR: BCOR 350 with a minimum grade of C-. Student teams work directly with participating companies to develop export business plans for specific products and specific countries.

MKTG 445. Start Up Marketing Promotions. 3 Hours.
PR: BCOR 350 with a minimum grade of C-. This is a 100% project-based experiential learning class that focuses on helping start-up companies with their marketing promotion campaigns. Students will work in small groups and work closely with owners of start-up companies to research, design, and implement promotion campaigns. This class covers new product introduction, customer generation, social media campaigns, and presentation to potential investors.

MKTG 450. Practicum in Marketing. 3 Hours.
PR: MKTG 325. This is an experiential course that requires using sustainability principles and/or social media principles to solve marketing problems for organizations.

MKTG 470. Marketing Management. 3 Hours.
PR: MKTG 325 with a minimum grade of C-. Simulation, through live and written case study, should sharpen skills as the student makes analytical evaluations of marketing problems.

MKTG 474. Integrated Promotions Campaign. 3 Hours.
PR: MKTG 380 with a minimum grade of C-. Students will work in teams to prepare a complete advertising/marketing and IMC recommendation for a real company with a defined marketing/integrated promotions need. The emphasis will be on developing sound strategies and rationales, solid creative and multiple media executions and professional quality work.

MKTG 475. Social Media and Marketing. 3 Hours.
PR: BCOR 350 with a minimum grade of C-. Students will explore and learn how to integrate these social media platforms into product and organization marketing efforts.

MKTG 480. Services Marketing. 3 Hours.
PR: BCOR 350 with a minimum grade of C-. Services marketing gives students an appreciation of the challenges of marketing and managing services and strategies for addressing these challenges. The course features a combination of lectures, in-class exercises and projects (including class presentations).

MKTG 485. Global Marketing. 3 Hours.
PR: BCOR 350 with a minimum grade of C-. Evaluation and analysis of marketing strategies in a global environment, examination of the relationship between international buyer behavior and the elements of the marketing mix.

MKTG 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

MKTG 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 6 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

MKTG 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MKTG 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

MKTG 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

MKTG 496. Senior Thesis. 1-3 Hours.
PR: Consent.

MKTG 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

MSEN 253. Fundamentals of Materials Engineering. 2 Hours.
PR: CHEM 115 and CHEM 115L and PHYS 111 with a minimum grade of C- in each. Atomic and crystallographic structure of materials, thermal and mechanical processing influences on microstructure, and composition and microstructural effects on mechanical and physical properties attributes.

MSEN 350. Materials Science. 3 Hours.
PR: CHEM 115 and CHEM 115L and PHYS 111 all with a minimum grade of C-. Chemical bonding and structures of metals, ceramics, and organic materials; the dependence of properties upon these structures and bonding conditions; thermal and mechanical stresses; corrosion; synthesis and preparation of materials.

MSEN 351L. Materials Engineering Laboratory. 1 Hour.
PR: CHEM 115 and CHEM 115L and PHYS 111 with a minimum grade of C- in each and PR or CONC: MSEN 350. Introduction to microscopy and spectroscopy material microstructure characterization techniques; materials macroscopic physical properties based on processing history, chemistry, crystal structure and microstructure; and methods to identify material needs for engineering application.

MSEN 354. Materials Processing and Manufacturing. 3 Hours.
PR: CHE 366 or MAE 253. Processing and manufacturing methods for metals, ceramics, polymers, composites, and hybrid materials; considerations for nano-, micro-, and macro-scale; relationships between process method, material structure, properties, cost, process energy requirements, and geometric limitations; and process selection based on materials selection and desired properties.

MSEN 355. Mechanical and Physical Properties of Materials. 3 Hours.
PR: CHE 366 or MAE 253. Mechanical, electrical, magnetic, optical properties of materials; relationships between materials synthesis, microstructure and physical properties; and selection of materials for application.

MSEN 449. Microscopy of Materials. 3 Hours.
PR: MSEN 350. Optical and electron microscopic principles and techniques. Sample preparation methods. Microstructures of engineering materials. Laboratory demonstrations and experiments.

MSEN 480. Crystallography and Crystals. 3 Hours.
PR: MSEN 350. Introduction to the principles of structure of materials, and theory and applications of diffraction and imaging techniques for materials characterization using X-ray diffraction and transmission electron microscopy (TEM).

MSEN 483. Thermodynamics and Kinetics of Materials. 3 Hours.
PR: MSEN 350. Fundamental concepts of thermodynamics and kinetics of materials. Classical thermodynamics. Examples of the application of thermodynamic concepts to the analysis of material systems.

MSEN 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MUSC 100. Fundamentals of Music Theory. 1 Hour.
An online course designed to prepare students to enter MUSC 162 (Written Theory 1). The course focuses on basic musical concepts including notation of pitch and rhythm, intervals, scales and modes, and keys and key signatures.

MUSC 101. Band: Concert. 1,2 Hour.
(May be repeated for a maximum of 16 credit hours.).

MUSC 101A. Band: Pep Band. 1,2 Hour.
(May be repeated for a maximum of 16 credit hours.).

MUSC 110. Fundamentals of Music. 3 Hours.
(Not open to music majors.) Introductory course designed to develop music reading skills through a systematic presentation of music notation and elementary compositional projects.

MUSC 111. Introduction to Music. 3 Hours.
Introductory course designed to develop an appreciation and understanding of the significance of music and to help the student develop intelligent listening habits.

MUSC 112. Great Composers in Performance. 3 Hours.
(Not open to music majors). A study of significant composers and their music. Lectures, in-class musical presentations, concert and rehearsal attendance will: (1) explore relationship of music to the development of society, (2) develop appropriate critical analysis and listening skills.

MUSC 113. American Popular Music. 3 Hours.
Introduction of history and development of American popular music.

MUSC 114. Music and the Immigrant Experience. 3 Hours.
A survey of music in North America, reflecting the diversity and multicultural character of music-making, emphasizing style, cultural context, and values attached to music as part of the immigrant experience.

MUSC 115. Introduction to History of Jazz. 3 Hours.
An Introduction to jazz, its characteristics, important performers, and their music, including an historical survey with attention to the changing style of the music.

MUSC 116. Music in World Cultures. 3 Hours.
Examination of music from various cultures (e.g. Native America, South India, Japan, Africa) within their cultural contexts.

MUSC 117. Hip Hop Nation: Musical and Conceptual Foundations of a Cultural Revolution. 3 Hours.
In this course, we will investigate the origins of Hip Hop music and culture. We will explore the 5 Elements of Hip Hop (DJ'ing, emceeing, b-boying/b-girling, writing/graffiti, and knowing). We will investigate Hip Hop through multiple critical lenses as a musical genre, but also as an important and lasting socio-cultural phenomenon.

MUSC 118. Music in Appalachia. 3 Hours.
Survey of traditional instrumental and vocal music of southern Appalachia. History, style characteristics, and performance techniques involving live and recorded examples emphasizing those found in West Virginia.

MUSC 119. Applied Music: Pipe Organ. 1-4 Hours.
(May be repeated for credit.) Audition for placement required. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 121. Applied Music: Euphonium. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 121A. Applied Music: Horn. 1-4 Hours.
Audition for placement required. (May be repeated for a maximum of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 121B. Applied Music: Trombone. 1-4 Hours.
Audition for placement required. (May be repeated for max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 121C. Applied Music: Trumpet. 1-4 Hours.
Audition for placement required. (May be repeated for max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 121D. Applied Music: Tuba. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 122. Applied Music: Jazz. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Weekly lesson and attendance at the jazz seminar addressing issues related to jazz performance, technology, pedagogy, and business aspects of music.

MUSC 123. Applied Music: Harpsichord. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 123A. Applied Music: Organ. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 123B. Applied Music: Piano. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 124. Applied Music: Percussion. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 124A. Applied Music: Drum Set. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 125. Applied Music: Cello. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 125A. Applied Music: Guitar. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 125B. Applied Music: String Bass. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 125C. Applied Music: Viola. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 125D. Applied Music: Violin. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 125E. Applied Music: Harp. 1-4 Hours.
Private instruction of solo, ensemble and orchestral harp repertoire. Students learn the proper techniques of harp playing, develop effective practice skills, critical musical thinking, and musical expression. Harp students perform in at least one school ensemble each semester. Audition required to be admitted to the course.

MUSC 126. Applied Music: Voice. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 127. Applied Music: Bassoon. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 127A. Applied Music: Clarinet. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 127B. Applied Music: Flute. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 127C. Applied Music: Oboe. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 127D. Applied Music: Saxophone. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 129. Music Technology 1: GarageBand. 1 Hour.
This course will provide an overview of Apple's GarageBand software, the fundamental recording techniques, and music production vocabulary, through video lectures and hands-on experience.

MUSC 130S. Piano Class 1. 1 Hour.
Entry-level piano class.

MUSC 131S. Piano Class 2. 1 Hour.
Audition for placement is required.

MUSC 132S. Piano Class 3. 1 Hour.
Audition for placement is required.

MUSC 133S. Piano Class 4. 1 Hour.
Audition for placement is required.

MUSC 134S. Piano Class Level 2-2 1/2. 1 Hour.
Audition for placement is required. (May be repeated for credit.).

MUSC 136S. Guitar Class 1. 1 Hour.
(May be repeated for credit.).

MUSC 137. Class Guitar 1. 1 Hour.
Introduction to guitar in a group setting. Students will learn all parts of the guitar, individual notes, rudimentary guitar chords in at least three (3) keys, and a variety of basic fingerpicking and strumming patterns. Students will learn to accompany their singing using the guitar in several basic styles.

MUSC 138. Voice Class 1. 2 Hours.
PR: Corequisite of MUSC 138S (May be repeated for credit).

MUSC 138S. Voice Class 1. 0 Hours.
PR: Corequisite of MUSC 138. (May be repeated for credit).

MUSC 139S. Voice Class 2. 2 Hours.
PR: Consent. (May be repeated for a maximum of 4 credit hours.).

MUSC 140. Commercial Music Aural Skills 1. 3 Hours.
The aural theory courses in commercial music form a unit of instruction devoted to the development of aural skills for commercial musicians. This course is designed to develop basic ear training skills through performance and dictation.

MUSC 141. Commercial Music Aural Skills 2. 3 Hours.
PR: MUSC 140. The aural theory courses in commercial music form a unit of instruction devoted to the development of aural skills for commercial musicians. This course is designed to develop basic ear training skills through performance and dictation.

MUSC 142. Commercial Music Fundamentals. 3 Hours.
The study of music fundamentals and their use in contemporary popular music for students with no prior literacy in music.

MUSC 143. Commercial Music Harmony and Form. 3 Hours.
PR: MUSC 142. The study of harmony and form and their use in contemporary popular music. This study includes aural analysis of contemporary songs, including form, bass motion, chord function, and the role of the rhythm section. It leads to an understanding of harmony, bass lines, rhythmic language, and form.

MUSC 144. Functional Keyboard for the Commercial Musician 1. 2 Hours.
The first course in a two-semester series designed to develop functional commercial piano skills for the non-keyboard music major.

MUSC 145. Functional Keyboard for the Commercial Musician 2. 2 Hours.
PR: MUSC 144 or instructor consent. The second course in a two-semester series designed to develop functional commercial piano skills for the non-keyboard music major.

MUSC 150. Chamber Music: Freshman Percussion. 1 Hour.
(May be repeated for credit.) PR: Consent.

MUSC 160S. Introduction to Music Composition. 3 Hours.
PR: Composition Major. Development of creativity in musical composition. For music composition majors in their first year of college-level study. May be repeated for credit; max. 6 hr.

MUSC 161. Aural Theory 1. 2 Hours.
Aural Theory 1 starts with an introduction to active listening. We explore the five main aspects of music through listening exercises and build on that knowledge to work on audiation (being able to hear things in your head) and functional listening (understanding what you hear without seeing it written down) through exercises that incorporate sight-singing and dictation.

MUSC 162. Written Theory 1. 3 Hours.
Elementary theory (scales, keys, intervals, triads, and dominant seventh chords) and introduction to diatonic harmony (part-writing and analysis.).

MUSC 163. Aural Theory 2. 2 Hours.
PR: MUSC 161. Aural Theory 2 builds on the material that students explored in Aural Theory 1. The end goal of the aural theory sequence is to build strong functional listening and audiation skills. To continue developing these skills, students use focused listening, dictation (single-voice, two-voice, and harmonic), and sight-singing in moderately complex diatonic settings.

MUSC 164. Written Theory 2. 3 Hours.
PR: MUSC 162. Continuation of MUSC 162. Chromatic harmony including secondary dominants, modulations, mode mixture, and complex chromatic chords.

MUSC 166. Theory for Music Theatre 1. 2 Hours.
Basics of music theory, including intervals, rhythm, notation and musical vocabulary. Emphasis on acquiring these skills through sight singing.

MUSC 167. Theory for Music Theatre 2. 2 Hours.
PR: MUSC 166. Intermediate skills in music theory, including rhythmic syncopation, melodic chromaticism, and an introduction to basic harmony and lead sheets.

MUSC 169. Diction for Singers: French. 2 Hours.
(May be repeated for credit; max 8 hr.) PR: Consent. Phonetics, phonetic symbols, and pronunciation in singing in alternating semesters in various languages. Other aspects of language that will aid in comprehension of song, oratorio, and operatic texts considered.

MUSC 169A. Diction for Singers: English. 2 Hours.
(May be repeated for credit; max 8 hr.) PR: Consent. Phonetics, phonetic symbols, and pronunciation in singing in alternating semesters in various languages. Other aspects of language that will aid in comprehension of song, oratorio, and operatic texts considered.

MUSC 169B. Diction for Singers: Italian. 2 Hours.
(May be repeated for credit; max 8 hr.) PR: Consent. Phonetics, phonetic symbols, and pronunciation in singing in alternating semesters in various languages. Other aspects of language that will aid in comprehension of song, oratorio, and operatic texts considered.

MUSC 169C. Diction for Singers:German. 2 Hours.
(May be repeated for credit; max 8 hr.) PR: Consent. Phonetics, phonetic symbols, and pronunciation in singing in alternating semesters in various languages. Other aspects of language that will aid comprehension of song, oratorio, and operatic texts considered.

MUSC 169D. Diction for Singers. 2 Hours.
(May be repeated for credit; max 8 hr.) PR: Consent. Phonetics, phonetic symbols, and pronunciation in singing in alternating semesters in English; Italian, Latin, Spanish, German, and French. Other aspects of language that will aid comprehension of song, oratorio, and operatic texts considered.

MUSC 180. Introduction to Music Education. 1 Hour.
Introduction to purposes of school music education, students as learners, content and structure of school music programs, and music teacher knowledge and skills.

MUSC 181. Fundamental Music Skills. 2 Hours.
(Not open to music majors.) Development of skills for future classroom teachers. Basic understanding of rhythm, dynamics, tone color, pitch, and form.

MUSC 182. Music in the Elementary School. 2 Hours.
(Not open to music majors.) Development of fundamental music skills and pedagogical strategies for integrating music into the elementary classroom.

MUSC 185. Introduction to Music Therapy. 3 Hours.
This course provides an overview of the music therapy profession including: history, therapeutic approaches, clinical processes, populations served, and current professional issues. Readings, lectures, clinical video observation, and in-class experiences will allow students to examine general principles of music therapy and gain understanding regarding the use of music as a viable therapeutic medium across a variety of populations.

MUSC 189. Music Convocation. 0 Hours.
(Required for all music majors for six semesters. May be repeated.) Faculty, guest artist, and student performances, lectures and forums on major musical issues and topics.

MUSC 191. First-Year Seminar. 3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

MUSC 200S. Fundamentals of Conducting. 2 Hours.
PR: MUSC 163 and MUSC 164. Basic conducting skills, including beat patterns, expressive gestures, cues, and the fermata; terminology; tempo changes; and the mechanics of score reading.

MUSC 201S. Conducting and Score Interpretation. 2 Hours.
PR: (MUSC 200 or MUSC 200S) or consent. Development of techniques of score study; rehearsal preparation. Rehearsals of laboratory ensemble. Study of string, wind, and choral scores.

MUSC 202S. Conducting and Rehearsing. 2 Hours.
PR: (MUSC 201 or MUSC 201S) or consent. Intensive study of wind, choral, and orchestral scores, rehearsed by the laboratory ensemble. Conducting of a major performance ensemble in rehearsal.

MUSC 205. Clinical Foundations of Music Therapy. 3 Hours.
PR: MUSC 185 with a minimum grade of C-. This course discusses and demonstrates basic clinical foundations of the music therapy profession including treatment process, methods of delivery, considerations necessary in a therapeutic relationship, and the professional role of the music therapist.

MUSC 211. Freelance Career Skills for Musicians. 2 Hours.
This course provides an introductory overview of many of the administrative and technical skills that most musicians will be required to employ throughout a career as a performer, teacher, or composer.

MUSC 221. Applied Music: Euphonium. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 121. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 221A. Applied Music: Horn. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 121A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 221B. Applied Music: Trombone. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 121B. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 221C. Applied Music: Trumpet. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 121C. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 221D. Applied Music: Tuba. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 121D. Credit and lesson length varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 222. Applied Music: Jazz. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 122. Credit and length of lesson varies Weekly lesson and attendance at the jazz seminar addressing issues related to jazz performance, technology, pedagogy, and business aspects of music.

MUSC 223. Applied Music: Harpsichord. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 123. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 223A. Applied Music: Organ. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 123A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic, and pedagogical aspects of music.

MUSC 223B. Applied Music: Piano. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 123B. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 224. Applied Music: Percussion. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 124. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic, and pedagogical aspects of music.

MUSC 224A. Applied Music: Drum Set. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 124A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 225. Applied Music: Cello. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 125. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 225A. Applied Music: Cello. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 125A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 225B. Applied Music: String Bass. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 125B. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 225C. Applied Music: Viola. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 125C. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 225D. Applied Music: Violin. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 125D. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic, and pedagogical aspects of music.

MUSC 225E. Applied Study: Harp. 1-4 Hours.
PR: MUSC 125E. Private instruction of solo, ensemble and orchestral harp repertoire. Second year students learn basic techniques of harp playing, develop effective practice skills, critical musical thinking, and musical expression. Harp students perform in at least one school ensemble each semester. Successful completion of MUSC 125E is required to be admitted to the course.

MUSC 226. Applied Music: Voice. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 credit hours.) Continuation of MUSC 126. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 227. Applied Music: Bassoon. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 127. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic, and pedagogical aspects of music.

MUSC 227A. Applied Music: Clarinet. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 127A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 227B. Applied Music: Flute. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 127B. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 227C. Applied Music: Oboe. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 127C. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 227D. Applied Music: Saxophone. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 127D. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 230S. Music Therapy Methods 1. 3 Hours.
PR: MUSC 185 and MUSC 205 with a minimum grade of C- in each and PR or CONC: (MUSC 239 or MUSC 239S). This course provides instruction in appropriate interventions utilizing receptive, recreative, improvisatory, and compositional methods across the lifespan with a greater focus on children and adolescents. Students will design and implement music therapy experiences for both individuals and groups.

MUSC 231. Music Therapy Methods 2. 3 Hours.
PR: MUSC 230 and MUSC 239 with a minimum grade of C- in each. This course provides instruction in appropriate interventions utilizing receptive, recreative, improvisatory, and compositional methods across the lifespan with a greater focus on adults and older adults. Students will design and implement music therapy experiences for both individuals and groups.

MUSC 236. Introduction to Recording Technology. 2 Hours.
Technology of recording and producing audio for broadcast and/or media release. Basics of acoustic sound and technology, recording methods, listening to and analysis of a variety of styles, and hands-on production work.

MUSC 237. Class Guitar 2. 1 Hour.
PR: MUSC 137 with a minimum grade of C-. Intermediate guitar skills in group setting. Students will learn individual notes, guitar chords, barre chords, and fingerpicking and strumming patterns as a continuation of the material taught in MUSC 137. Students will continue to accompany their singing using the guitar in several styles. Students will learn to transpose songs and write songs in basic formats such as the 12-bar blues.

MUSC 239. Music Therapy Practicum 1. 2 Hours.
PR: MUSC 205 with a minimum grade of C- in each and PR or CONC: (MUSC 230 or MUSC 230S). Students complete weekly supervised clinical training opportunities with diverse clients in a variety of clinical settings. Students will complete all four stages of the clinical therapeutic process. Students will learn, apply, and refine professional competencies through experiential learning.

MUSC 239A. Music Therapy Practicum 2. 2 Hours.
PR: (MUSC 230 and MUSC 239) with a minimum grade of C- in each and PR or CONC: MUSC 231. Students complete weekly supervised clinical training opportunities with diverse clients in a variety of clinical settings. Students will complete all four stages of the clinical therapeutic process. Students will learn, apply, and refine professional competencies through experiential learning.

MUSC 261. Aural Theory 3. 2 Hours.
PR: MUSC 163. Aural Theory 3 builds on the material that students explored in Aural Theory 2. The end goal of the aural theory sequence is to build strong functional listening and audiation skills. To continue developing these skills, students use focused listening, dictation (single-voice, two-voice, and harmonic), and sight-singing in complex diatonic and chromatic settings.

MUSC 262. Written Theory 3. 3 Hours.
PR: MUSC 164. Continuation of MUSC 164. Examination of forms and the analysis of more complex structures, including linear analysis. Lead sheet realization.

MUSC 263. Aural Theory 4. 2 Hours.
PR: MUSC 261. Continuation of MUSC 261 with more of a focus on extended harmony and modulation.

MUSC 264. Written Theory 4. 2 Hours.
PR: MUSC 262. Consideration of melody, rhythm, harmony, texture, form, etc., and how they function to produce an organic work of art. Analysis of larger musical forms and emphasis on twentieth century techniques.

MUSC 265. Instrumentation. 2 Hours.
PR: MUSC 164. Study of characteristics of band and orchestral instruments and their use in scoring.

MUSC 266. Orchestration and Band Arranging. 2 Hours.
PR: MUSC 265. Problems in scoring for orchestra and band.

MUSC 269A. Diction for Singers: English and Italian. 3 Hours.
PR: Consent. Phonetics, phonetic symbols, and pronunciation in singing in alternating semesters in various languages. Other aspects of language that will aid in comprehension of song, oratorio, and operatic texts considered. (May be repeated for credit; max 12 hr.).

MUSC 269B. Diction for Singers: German and French. 3 Hours.
PR: Consent. Phonetics, phonetic symbols, and pronunciation in singing in alternating semesters in various languages. Other aspects of language that will aid in comprehension of song, oratorio, and operatic texts considered. (May be repeated for credit; max 12 hr.).

MUSC 270. History of Western Musical Traditions 1. 3 Hours.
PR: MUSC 111 or MUSC 113 or MUSC 114 or MUSC 115 or MUSC 116 or MUSC 118 or MUSC 151 or MUSC 177. Survey of Western musical traditions from the Christian era to c1800 in their stylistic, historic, and social settings.

MUSC 271. History of Western Musical Traditions 2. 3 Hours.
PR: ENGL 102 and (MUSC 111 or MUSC 113 or MUSC 114 or MUSC 115 or MUSC 116 or MUSC 118 or MUSC 151). Survey of Western musical traditions from c1800 to the present in their stylistic, historic, and social settings. Pre-requisite(s) and/or co-requisite(s) may differ on regional campuses.

MUSC 272. Music in Cross Cultural Traditions. 3 Hours.
PR: ENGL 102 and (MUSC 111 or MUSC 113 or MUSC 114 or MUSC 115 or MUSC 116 or MUSC 118 or MUSC 151). Survey of musical practices created by and maintained in the face of cross-cultural engagement.

MUSC 280. Woodwind Instrument Pedagogy. 2 Hours.
PR: Corequisite of MUSC 280S. Techniques of teaching woodwind instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repairs.

MUSC 280S. Woodwind Instrument Pedagogy. 0 Hours.
PR: Corequisite of MUSC 280. Techniques of teaching woodwind instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repairs.

MUSC 281. Brass Instrument Pedagogy. 2 Hours.
PR: Corequisite of MUSC 281S. Techniques of teaching brass instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

MUSC 281S. Brass Instrument Pedagogy. 0 Hours.
PR: Corequisite of MUSC 281. Techniques of teaching brass instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

MUSC 282. String Instrument Pedagogy. 2 Hours.
PR: Corequisite of MUSC 282S. Techniques of teaching string instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

MUSC 282S. String Instrument Pedagogy. 0 Hours.
PR: Corequisite of MUSC 282. Techniques of teaching string instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

MUSC 283. Percussion Instrument Pedagogy. 2 Hours.
PR: Corequisite of MUSC 283S. Techniques of teaching percussion instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

MUSC 283S. Percussion Instrument Pedagogy. 0 Hours.
PR: Corequisite of MUSC 283. Techniques of teaching percussion instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and repair.

MUSC 284. Vocal Pedagogy. 3 Hours.
Techniques for vocal performance and health; applicable to K12 school choral activities and instruction of young singers.

MUSC 284S. Vocal Pedagogy Studio. 0 Hours.
PR: Corequisite of MUSC 284. Studio course for MUSC 284.

MUSC 285. Wind Pedagogy. 2 Hours.
Techniques of teaching woodwind and brass instruments, including playing techniques, pedagogical techniques appropriate for young players, methods, materials, maintenance, and basic repairs.

MUSC 286. Advanced Jazz Improvisation. 2 Hours.
PR: MUSC 285 or consent. Continuation of MUSC 285. Analysis of chord progressions with emphasis on chord substitutions, turnbacks, and scales. Development of jazz repertoire through performance.

MUSC 289. Classroom Instruments. 1 Hour.
Students will gain proficiency on various instruments commonly used in elementary and secondary music classrooms.

MUSC 290. Music Teaching and Learning. 2 Hours.
PR: MUSC 180 with a minimum grade of C-. The purpose of Music Teaching and Learning is for students to develop and refine skills central to teacher development, including planning, developing resources, delivering instruction, assessing, and reflecting.

MUSC 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MUSC 298. Honors. 1-3 Hours.
PR: Student in Honors Program and consent by the honors director. Independent reading, study or research.

MUSC 300. Band: Wind Symphony. 1,2 Hour.
(May be repeated for a maximum of 16 credit hours.).

MUSC 300A. Band: Symphonic. 1,2 Hour.
(May be repeated for a maximum of 16 credit hours.).

MUSC 300B. Band: Marching. 1,2 Hour.
(May be repeated for a maximum of 16 credit hours.).

MUSC 302. University Community Choir. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 303. Symphony Orchestra. 1,2 Hour.
Audition required. (May be repeated for a maximum of 16 credit hours.).

MUSC 304. Introduction To Opera Theatre. 1 Hour.
PR: Consent. (May be repeated for a maximum of 4 credit hours.) Practical work in the development of basic lyric theatre stage technique through movement studies, and in-class, studio performances of operatic scenes.

MUSC 305. Chamber Singers. 1,2 Hour.
PR: Consent. (May be repeated for a maximum of 16 credit hours.).

MUSC 306. University Mountaineer Chorus. 1,2 Hour.
PR: Consent. (May be repeated for a maximum of 16 credit hours.).

MUSC 307. Mountaineer Singers. 1,2 Hour.
PR: Consent. (May be repeated for a maximum of 16 credit hours.).

MUSC 308S. Funk and Soul Ensemble. 1,2 Hour.
The Funk and Soul Ensemble explores the rhythms, grooves, and improvisation of funk and soul music. Students perform and analyze iconic repertoire while developing skills in rhythm, harmony, and group coordination. Emphasis is placed on stylistic authenticity, including call-and-response, syncopation, and dynamic expression. The ensemble fosters collaborative musicianship, deepening students' understanding of cultural and historical significance.

MUSC 309S. Recording Session Band. 1 Hour.
The Recording Session Band Ensemble focuses on developing the skills required for professional studio work. Students perform and record in various genres, mastering recording techniques, communication with artists and producers, and interpreting musical directions. Emphasis is placed on adaptability, precision, and collaboration, preparing students for real-world recording environments and enhancing their industry readiness.

MUSC 311. Introduction to Jazz and Commercial Music Improvisation. 2 Hours.
PR: MUSC 163 and MUSC 164 or consent. Development of improvisatory skills in the jazz and commercial music idiom using melodic, harmonic, and rhythmic motives and patterns, and the application of knowledge of tonal centers, chord progressions, and junctions.

MUSC 313. Advanced Jazz and Commercial Music Improvisation. 2 Hours.
PR: MUSC 311 or consent. Continuation of MUSC 311. Analysis of chord progressions with emphasis on chord substitutions, turnbacks, and scales. Development of jazz and commercial music repertoire through performance.

MUSC 320. Technology in the Music Classroom. 2 Hours.
In this course, students will explore educational uses for recording, amplification, and software technologies.

MUSC 321. Applied Music: Euphonium. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 221. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 321A. Applied Music: Horn. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 221A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 321B. Applied Music: Trombone. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 221B. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 321C. Applied Music: Trumpet. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 221C. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 321D. Applied Music: Tuba. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 221D. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 322. Applied Music: Jazz. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 222. Weekly lesson and attendance at the jazz seminar addressing issues related to jazz performance, technology, and business aspects of music.

MUSC 323. Applied Music: Harpsichord. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hr.) Continuation of MUSC 223. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 323A. Applied Music: Organ. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 223A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 323B. Applied Music: Piano. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 223B. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 324. Applied Music: Percussion. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 224. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 324A. Applied Music: Drum Set. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 224A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 325. Applied Music: Cello. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 225. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic, and pedagogical aspects of music.

MUSC 325A. Applied Music: Guitar. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 225A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic, and pedagogical aspects of music.

MUSC 325B. Applied Music: String Bass. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 225B. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 325C. Applied Music: Viola. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 225C. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 325D. Applied Music: Violin. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 225D. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 325E. Applied Study: Harp. 1-4 Hours.
PR: MUSC 225E. Private instruction of solo, ensemble and orchestral harp repertoire. Third year students learn intermediate techniques of harp playing, develop effective practice skills, critical musical thinking, and musical expression. Harp students perform in at least one school ensemble each semester. Successful completion of MUSC 225E is required to be admitted to the course.

MUSC 326. Applied Music: Voice. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 226. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 327. Applied Music: Bassoon. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 327. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 327A. Applied Music: Clarinet. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 227A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic, and pedagogical aspects of music.

MUSC 327B. Applied Music: Flute. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 227B. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 327C. Applied Music: Oboe. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 227C. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 327D. Applied Music: Saxophone. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 227D. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 328. Applied Lessons for Minors. 1,2 Hour.
PR: Audition or Consent. (May be repeated for a maximum of 16 credit hours.) Applied music lessons.

MUSC 330. Principles and Practices of Music Therapy 1. 3 Hours.
PR: MUSC 339 and Music Therapy majors only. This course covers music therapy principles and practices for serving clients in various populations outlined by the AMTA's Standards of Practice. Course content includes, but is not limited to, characteristics and needs, research and literature, and clinical work when working with these populations, as well as ethical considerations within music therapy, approaches to music therapy, and advanced music therapy techniques.

MUSC 331. Principles and Practices of Music Therapy 2. 3 Hours.
PR: Music Therapy Majors only; MUSC 330 with a minimum grade of C- and PR or CONC: MUSC 339A. This course covers music therapy principles and practices for serving clients in various populations outlined by the AMTA's Standards of Practice. Course content includes, but is not limited to, characteristics and needs, research and literature, and clinical work when working with these populations, as well as ethical considerations within music therapy, approaches to music therapy, and advanced music therapy techniques.

MUSC 336. Introduction to Pro Tools. 3 Hours.
PR: MUSC 236 with a minimum grade of C-. Principles of Pro Tools. Students will be introduced to the key audio and MIDI concepts required to complete a Pro Tools project from set-up to final mix-down.

MUSC 337. Digital Audio Workstations. 3 Hours.
PR: MUSC 336 with a minimum grade of C-. Students will be introduced to DAW alternative(s) from the primary DAW used in MUSC 336. Audio and MIDI concepts required to complete a project from set-up to final mix-down.

MUSC 338. Sound-Games/Visual Media. 2 Hours.
PR: MUSC 336 with a minimum grade of C-. Provides students with some of the core skills and ideas required to implement audio in a video game or visual media.

MUSC 339. Music Therapy Practicum 3. 2 Hours.
PR: MUSC 231 and MUSC 239A with a minimum grade of C- in each and PR or CONC: MUSC 330 or MUSC 330S and Music Therapy majors only. Students complete weekly supervised clinical training opportunities with diverse clients in a variety of clinical settings. Students will complete all four stages of the clinical therapeutic process. Students will learn, apply, and refine professional competencies through experiential learning.

MUSC 339A. Music Therapy Practicum 4. 2 Hours.
PR: MUSC 330 and MUSC 339 with a minimum grade of C- in each and PR or CONC: MUSC 331. Students complete weekly supervised clinical training opportunities with diverse clients in a variety of clinical settings. Students will complete all four stages of the clinical therapeutic process. Students will learn, apply, and refine professional competencies through experiential learning.

MUSC 340. Chamber Music: Brass. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 341. Chamber Music: Guitar. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 342. Chamber Music: Piano-4 Hand. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 343. Chamber Music: Strings. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 344. Chamber Music: Woodwind. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 345. Chamber Music: Vocal. 1 Hour.
PR: Consent (May be repeated for a maximum of 8 credit hours.).

MUSC 346. Chamber Music: Mixed Ensemble. 1 Hour.
PR: Consent (May be repeated for a maximum of 8 credit hours.).

MUSC 347. Chamber Music: Mountaineer Singers. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 348. Chamber Music: New Music. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349A. Chamber Music: Brass Choir. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349B. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hour.).

MUSC 349C. Chamber Music: Other-Vocal Accompaniment. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349D. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349E. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349F. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349G. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349H. Chamber Music: Other. 1 Hour.
PR: Consent. (May be offered for a maximum of 8 credit hours.).

MUSC 349I. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349J. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349K. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349L. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349M. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349N. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349O. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349P. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349Q. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349R. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349S. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349T. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349U. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349V. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349W. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349X. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349Y. Chamber Music: Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 349Z. Collegium Musicum. 1-2 Hours.
PR: Consent. (May be repeated for a maximum of 8 credit hours.) Study of outstanding musical works not in the standard repertory. Performance of vocal and instrumental music, investigation of performance practices, preparation of editions, and direction of rehearsals under supervision.

MUSC 350. Jazz Ensemble 2. 1 Hour.
PR: By audition. (May be repeated for a maximum of 8 credit hours.).

MUSC 351. Chamber Music: Percussion 1. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 352. Chamber Music: Percussion 2. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 353. Large Jazz Ensemble 1. 2 Hours.
PR: Consent. Performing jazz ensemble focusing on large jazz band repertoire. May be repeated a maximum of 8 credit hours

MUSC 353B. Chamber Music: Jazz Small Group. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 353C. Chamber Music: Jazz Small Group 2. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 353E. Chamber Music: Jazz and Ethnic. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 353G. Chamber Music: Jazz Vocal Ensemble. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 353H. Chamber Music: Jazz Other. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 353I. Chamber Music: Jazz Vocal Ensemble. 1 Hour.
PR: Consent. (May be repeated for a maximum of 8 credit hours.).

MUSC 354. Gamelan. 1 Hour.
Ensemble that explores the gamelan traditions of Indonesia. (May be repeated for a maximum of 8 credit hours.).

MUSC 355. Steel Band. 1 Hour.
(May be repeated for a maximum of 8 credit hours.).

MUSC 356. African Music Ensemble. 1 Hour.
Performing ensemble focusing on music of Africa. (May be repeated for a maximum of 8 credit hours.).

MUSC 357. Brazilian Music Ensemble. 1 Hour.
Performing ensemble focusing on music of Brazil. (May be repeated for a maximum of 8 credit hours.).

MUSC 358. Experiential Music Ensemble. 1 Hour.
Small music ensemble that will explore a variety of global music. (May be repeated for a maximum of 8 credit hours.).

MUSC 359. Taiko Ensemble. 1 Hour.
Performing ensemble focusing on Taiko music. (May be repeated for a maximum of 8 credit hours.).

MUSC 360. Composition. 2 Hours.
PR: MUSC 264 or consent. Creative writing of music. An elective for non-composition majors.

MUSC 361. Fife and Drum Ensemble. 2 Hours.
This course will explore the techniques, history, and performance practice of the fife and drum musical genre. Styles of music will include early American military calls, 19th-century fife and drum repertoire, and 20th-century West Virginian and Appalachian folk music. The ensemble uses traditional 6 hole fifes and rope tension snare and bass drums.

MUSC 362. Instrumentation and Orchestration. 3 Hours.
PR: MUSC 262 and MUSC 263. Study of the fundamentals of instrumentation and their application in the transcription, arranging, and orchestration of pre-existing musical compositions.

MUSC 363. Appalachian Music Ensemble. 1 Hour.
PR: Consent. Ensemble-based exploration of Appalachian musical traditions.

MUSC 364. Popular Music Analysis Seminar. 3 Hours.
PR: MUSC 262 with a minimum grade of C-. This course examines the use of music in film and video games. Students analyze film and video game music with techniques learned in previous levels of theory and new techniques specific to this genre. They also utilize composition to get a hands-on understanding of how media composition works.

MUSC 365. Songwriting: Composition and Analysis. 3 Hours.
PR: MUSC 262 with a minimum grade of C-. Students learn the craft of songwriting in this course. Students analyze selected songs from the 1700s to the present to understand the way the process of songwriting developed. They also study the ways in which the natural accents of speech and poetry line up with musical accents, learning how to effectively set text to music.

MUSC 380. Instrumental Methods and Technology Applications. 3 Hours.
PR: MUSC 280 and MUSC 281 and MUSC 284 with a minimum grade of C- (and associated proficiency examinations) and for music education majors, successful completion of all pre-professional requirements. Methods, materials, and administration of K-12 instrumental music programs and application of instructional technology. Bi-weekly laboratory.

MUSC 380S. Instrumental Methods and Technology Applications. 0 Hours.
PR: For music education majors, successful completion of all pre-professional requirements. Methods, materials, and administration of K-12 instrumental music programs and application of instructional technology. Bi-weekly laboratory.

MUSC 381. Choral Music Methods and Technology Applications. 3 Hours.
PR: For music education majors, successful completion of all pre-professional requirements. Methods, materials, and administration of K-12 choral music programs and application of instructional technology. Bi-weekly laboratory.

MUSC 381S. Choral Music Methods and Technology Applications. 0 Hours.
PR: For music education majors, successful completion of all pre-professional requirements. Methods, materials, and administration of K-12 choral music programs and application of instructional technology. Bi-weekly laboratory.

MUSC 382. General Music Methods and Technology Applications. 3 Hours.
PR: MUSC 280 and MUSC 281 and MUSC 284 with a minimum grade of C- in all and Coreq: MUSC 382S, (and associated proficiency examinations) and for music education majors, successful completion of all pre-professional requirements. Methods, materials, curriculum, and technology applications for elementary general music programs. Weekly practicum (arranged).

MUSC 382S. General Music Methods and Technology Applications. 0 Hours.
PR: For music education majors, successful completion of all pre-professional requirements. Methods, materials, curriculum, and technology applications for elementary general music programs. Weekly practicum (arranged).

MUSC 384. Music Arranging for Public School Groups. 2 Hours.
PR: MUSC 262. Practical experience in techniques of making simple, workable arrangements of music for public school choral and instrumental performance groups.

MUSC 385. Survey of Wind Literature. 2 Hours.
PR: MUSC 177. This course traces the development of wind instrument literature from the Renaissance period to present day, with particular emphasis on the twentieth-century American wind band.

MUSC 393A. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MUSC 400. Studio Master Class. 0 Hours.
PR: Consent. A weekly master class in which private students of one performance instructor gather to perform for each other, receive positive and constructive feedback from the instructor and other students, and explore pedagogy along with other aspects of music making.

MUSC 404S. Lyric Theatre. 1 Hour.
Practical work in all aspects of lyric theatre performance. Advanced lyric theatre stage technique developed through preparation and performance of major and minor roles in productions. Classes and rehearsals will include training in movement, acting, improvisation, character and scene analysis, role preparation, stage direction, audition techniques, directing, and more.

MUSC 408L. Piano Technology. 1,2 Hour.
PR: Permission of instructor. Introduces piano tuning and technical skills with an emphasis on the history and development of keyboard instruments, piano construction and design, piano maintenance, tuning theory and practice, action regulation, basic piano repairs, and theoretical aspects of voicing. Develop ear training skills and the physical dexterity to manipulate tuning tools and perform repair and regulation procedures.

MUSC 409. Brass & Woodwind Instrument Maintenance and Repair. 2 Hours.
PR: Permission of instructor. This course will serve as an introduction to the care, management, preventative, and regular maintenance requirements of brass and woodwind instruments. It will teach the diagnosis and execution of simple repairs suitable for students to undertake and the ability to discern when a professional technician is required.

MUSC 410. Introduction to Music Industry. 3 Hours.
Introductory overview of the music industry's history, business, technology, and law. Students will gain essential understanding and skills necessary for professional involvement and progress in the music industry.

MUSC 411. Intellectual Property in Music Industry. 3 Hours.
Regulatory frameworks and copyright law application and implementation as related to music industry systems. Tools and strategies used to identify, protect and manage intellectual property in the music industry. Topics include: domestic and international perspective of music ownership issues, music industry contracts, licensing, and the commercializing of intellectual property in music industry.

MUSC 412. Music Product Development and Placement. 3 Hours.
PR: MUSC 411. Key music product development and placement principles structures, and practices using today's music commerce mechanisms, techniques and technologies for publicity, product advancement, consumer research, and distribution. Design, implementation, control, and evaluation of effective music product market advancement and positioning.

MUSC 413. Live Music Industry. 3 Hours.
PR: MUSC 411. Regulations, standards, strategies, and methods of live music event planning, advancement, and implementation. Topics include: talent and venue buying and deal structuring, budgeting, sponsorships, live sound production, music event contracts, licensing, publicity and placement, ticketing, and insurance.

MUSC 414. Recording Industry. 3 Hours.
PR: MUSC 411. Recording industry system development, markets, structures, commercial methods and strategies. Topics include: historical development of the recording industry; industry specific copyright regulations and commercial agreements; record company structures and models; recording production processes and technology; global music markets.

MUSC 415. Music Publishing. 3 Hours.
PR: MUSC 411. Development, commercial methods, scopes, and practices of the music publishing industry; copyrights acquisition, advancement, and protection. Topics include: history of the music publishing and related copyright regulations; royalties and licensing; performing rights; music publishing and television, film, commercials, musicals, video games, and other media; music publishing agreements; international music publishing.

MUSC 416. Executive Producing in Music Industry. 3 Hours.
PR: MUSC 140 and MUSC 142 and MUSC 236 and MUSC 410 with a minimum grade of C- in all. Students will gain essential understanding and skills necessary for the role of executive producers in the creation of sound recordings for artists, recording project budgeting and timelines. Students will learn to recognize and interpret basic audio recording terminology, methods and practices along with analyzing and evaluating current and past influential producers.

MUSC 417. Live Sound Production in Music Industry. 3 Hours.
PR: MUSC 236 with a minimum grade of C-. This course is an overview of live music production theory and practice, including sound reinforcement concepts, practices, equipment, as well as standard professional live audio engineering and production techniques. This course explores the fundamentals and advanced techniques of live audio production and sound systems, providing students with practical knowledge and hands-on experience in creating high-quality sound reinforcement for live events.

MUSC 418. Artist Management in Music Industry. 3 Hours.
PR: MUSC 410 and MUSC 412 with a minimum grade of C- in each. The Artist Management in the Music Industry course explores the strategic, financial, and relational aspects of managing artists, focusing on career development, branding, and navigating the complexities of the modern music landscape.

MUSC 420. International Music Industry. 3 Hours.
PR: MUSC 410 and MUSC 411 with a minimum grade of C- in each. This course covers the commercial/economic ecosystem, regulatory framework, and personal consumption habits in the world’s largest music markets and developing countries. Particular emphasis is given to the strategies employed by key stakeholders (record labels, recording artists, rightsholders) to maximize revenue and capitalize on new technologies that will increase sales and exposure of recorded and live music.

MUSC 421. Applied Music: Euphonium. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 321. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 421A. Applied Music: Horn. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 321A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 421B. Applied Music: Trombone. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 321B. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 421C. Applied Music: Trumpet. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 321C. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 421D. Applied Music: Tuba. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 321D. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 422. Applied Music: Jazz. 1-4 Hours.
Audition for Placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 322. Weekly lesson and attendance at jazz seminar addressing issues related to jazz performance, technology, pedagogy and business aspects of music.

MUSC 423. Applied Music: Harpsichord. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 323. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 423A. Applied Music: Organ. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 323A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 423B. Applied Music: Piano. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 323B. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 424. Applied Music: Percussion. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 324. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 424A. Applied Music: Drum Set. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 324A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 425. Applied Music: Cello. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 325. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 425A. Applied Music: Guitar. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 425A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 425B. Applied Music: String Bass. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 325B. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic, and pedagogical aspects of music.

MUSC 425C. Applied Music: Viola. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 325C. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 425D. Applied Music: Violin. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 325D. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 425E. Applied Study: Harp. 1-4 Hours.
PR: MUSC 325E. Private instruction of solo, ensemble and orchestral harp repertoire. Fourth year students learn advanced techniques of harp playing, develop effective practice skills, critical musical thinking, and musical expression. Harp students perform in at least one school ensemble each semester. Successful completion of MUSC 325E is required to be admitted to the course.

MUSC 426. Applied Music: Voice. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 credit hours.) Continuation of MUSC 326. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 427. Applied Music: Bassoon. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 327. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 427A. Applied Music: Clarinet. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 327A. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 427B. Applied Music: Flute. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 327B. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 427C. Applied Music: Oboe. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 327C. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 427D. Applied Music: Saxophone. 1-4 Hours.
Audition for placement required. (May be repeated for a max of 8 hours.) Continuation of MUSC 327D. Credit and length of lesson varies dependent on curriculum. Weekly lesson to develop technical, artistic and pedagogical aspects of music.

MUSC 430. Piano Class Methods and Materials. 3 Hours.
Methods, materials, and pedagogical techniques, including presentation of keyboard theory as used in functional piano. Practical organization of piano classes. Laboratory: Observation of experienced class teacher and student teaching.

MUSC 431. Survey of Keyboard Technique. 3 Hours.
This course surveys keyboard technique from the late Baroque to today. It explores the development of three “schools” or approaches to keyboard/piano playing, from the early finger technique to the use of the wrist and arm weight to weight relaxation and coordination. The course includes exploring treatises, literature, and current videos and other resources.

MUSC 432. Methods and Pedagogy. 2 Hours.
PR: Junior standing or consent.

MUSC 433. Methods and Pedagogy. 3 Hours.
Focus to include advanced pedagogical techniques on individual (and related) instruments or voices, pedagogical techniques appropriate for young players, and an examination of methods, materials, maintenance, and repair.

MUSC 434. Literature and Repertory. 3 Hours.
A survey of instrumental or voice solo and ensemble literature from the late 17th century to the present. Emphasis on historical perspectives, tracing the development of genres, aspects of performance practice techniques, performances of representative works, and general score analysis.

MUSC 435. Repertoire:Voice. 2 Hours.

MUSC 435A. Repertoire: Piano. 2 Hours.

MUSC 435B. Repertoire: Other. 2 Hours.

MUSC 435C. Repertoire. 3 Hours.
An in-depth study of the standard operatic repertoire from the 17th Century to the present. Focus is on the development of the genre and the performance characteristics and styles.

MUSC 435D. Repertoire. 2 Hours.

MUSC 435E. Repertoire. 2 Hours.

MUSC 435F. Repertoire. 2 Hours.

MUSC 435G. Repertoire. 2 Hours.

MUSC 435H. Repertoire. 2 Hours.

MUSC 435I. Repertoire. 2 Hours.

MUSC 435J. Repertoire. 2 Hours.

MUSC 435K. Repertoire. 2 Hours.

MUSC 435L. Repertoire. 2 Hours.

MUSC 435M. Repertoire. 2 Hours.

MUSC 435N. Repertoire. 2 Hours.

MUSC 435O. Repertoire. 2 Hours.

MUSC 435P. Repertoire. 2 Hours.

MUSC 435Q. Repertoire. 2 Hours.

MUSC 435R. Repertoire. 2 Hours.

MUSC 435S. Repertoire. 2 Hours.

MUSC 435T. Repertoire. 2 Hours.

MUSC 435U. Repertoire. 2 Hours.

MUSC 435V. Repertoire. 2 Hours.

MUSC 435W. Repertoire. 2 Hours.

MUSC 435X. Repertoire. 2 Hours.

MUSC 435Y. Repertoire. 2 Hours.

MUSC 435Z. Repertoire. 2 Hours.

MUSC 436. Advanced Digital Audio Workstation Technology. 3 Hours.
PR: MUSC 336 with a minimum grade of C-. Key audio and MIDI concepts required to operate a DAW in a professional environment.

MUSC 437. Practicum-Recording Technology. 4 Hours.
PR: MUSC 336 with a minimum grade of C-. (May be repeated for a maximum of 8 credit hours.) Application of recording techniques learned in a professional environment.

MUSC 438. Operatic Styles and Repertory. 3 Hours.
An in-depth study of the standard operatic repertoire from the 17th Century to the present. Focus is on the development of the genre and the performance characteristics and styles.

MUSC 439. Songwriting with Technology. 3 Hours.
PR: MUSC 236 with a minimum grade of C- or instructor approval. This course is designed to familiarize those new to songwriting with the basic tools and techniques and deepen the craft for those with experience.

MUSC 440. Music Therapy Practicum 5. 2 Hours.
PR: Music Therapy Majors only; (MUSC 331 and MUSC 339A) with a minimum grade of C- in each. Students complete weekly supervised clinical training opportunities with diverse clients in a variety of clinical settings. Students will complete all four stages of the clinical therapeutic process. Students will learn, apply, and refine professional competencies through experiential learning.

MUSC 440A. Music Therapy Practicum 6. 2 Hours.
PR: Music Therapy Majors only; MUSC 440 with a minimum grade of C- and PR on CONC: MUSC 445. Students complete weekly supervised clinical training opportunities with diverse clients in a variety of clinical settings. Students will complete all four stages of the clinical therapeutic process. Students will learn, apply, and refine professional competencies through experiential learning.

MUSC 444. Psychological Foundations of Music. 3 Hours.
PR: Consent or Music Therapy Major. This course provides students with understanding of how music influences human behavior, including but not limited to, physical, psychological, and physiological responses to various aspects of music and how responses are utilized in the therapeutic process.

MUSC 445. Music Therapy Research Methods. 3 Hours.
PR: Music Therapy Majors only; MUSC 331 and MUSC 339A and MUSC 444 with a minimum grade of C-in each. This course will provide an academic study of various research methods used in music therapy with applications to clinical populations. This course includes reading, interpreting, and proposing research including objectivist and interpretivist approaches, as related to evidence-based practice. A 15–20-page research study proposal in this course serves as the capstone project for the Bachelor of Music in Music Therapy degree.

MUSC 450. Capstone in Music & Health. 3 Hours.
PR: Consent and Senior Standing. The student will conduct in-depth study/research on a topic of choice, and craft a project of significant value. The student will meet with the instructor regularly to discuss progress, revision, and reorganization. A public presentation of the project is required.

MUSC 451. Capstone Project in Music - Bachelor of Arts. 3 Hours.
PR: Consent and Senior Standing. The capstone project for the Bachelor of Arts in Music is an opportunity for students to complete an individual project that prepares them for professional opportunities or continuing education in the field of music or related fields with the mentorship of a faculty member or multiple faculty members.

MUSC 452. Capstone Project in Music Business & Industry. 3 Hours.
PR: Consent and Senior Standing. Creation of the capstone project utilizing acquired understanding in creative, technical, and operational elements of the commercial music industry's methods and practices. In this course, students will develop an approach, timeline, and self-evaluative criteria for assessment for their project, and realize this project at the level of artistry and professionalism required in the field.

MUSC 459. Film and Video Game Composition. 3 Hours.
PR: MUSC 164 or instructor permission. Media composers are storytellers. Whether in film, television, podcasts, or video games, music and sound bring our digital worlds to life. This class explores approaches to producing work digitally for linear and non-linear mediums, emphasizing interdisciplinary collaboration with game designers, programmers, film directors, and other creative partners.

MUSC 460A. Electronic Music Composition. 2,4 Hours.
PR: MUSC 465S and MUSC 466 or consent. Individual lessons in composition, concentrating on advanced topics in electronic music.

MUSC 460S. Upper Division Composition. 2,4 Hours.
PR: MUSC 360 with a minimum grade of B-, or 2 semesters of (MUSC 160 or MUSC 160S), or consent based on scores submitted. Creative writing of music, primarily for acoustic instruments, for music composition majors. Non-composition majors may take the course with a permission of the instructor.

MUSC 461. Counterpoint, 16th Century. 3 Hours.
PR: MUSC 262 or consent. The content of this course is stylistic, focusing on the contrapuntal techniques of the late Renaissance period. Through analysis, composition exercises, performance, and listening, students explore concepts such as mode, melody, cadences, and two- and three-part species counterpoint. Students also discuss advanced polyphonic techniques such as imitation and canon.

MUSC 462. Counterpoint, 18th Century. 3 Hours.
PR: MUSC 262 or consent. Eighteenth century counterpoint.

MUSC 463. Analysis of Eighteenth and Nineteenth Century Music. 3 Hours.
PR: MUSC 262 or instructor consent. Detailed study of the materials and structure of European music of the eighteenth and nineteenth-centuries.

MUSC 464. Compositional Techniques in Contemporary Music. 3 Hours.
PR: MUSC 262 or consent. Survey of analytical techniques of contemporary music.

MUSC 465S. Electronic Music Production. 2 Hours.
PR: MUSC 143 or MUSC 164 or consent. Introductory course studying the software, hardware, production, and mixing techniques associated with the production of electronic music. Students learn technical concepts, gain hands-on experience with software and technology, discuss aesthetic concerns, and produce musical compositions.

MUSC 466. Techniques for Electronic Music Performance. 2 Hours.
PR: MUSC 143 or MUSC 164 or consent. Survey of techniques for live performance of electronic music.

MUSC 467. Major Project in Theory, Composition, or Music History. 2 Hours.
(Not available for graduate credit.) PR: MUSC 264.

MUSC 468. Jazz and Commercial Music Harmony. 2 Hours.
PR: MUSC 286 or consent. Advanced jazz and commercial music theory and harmony. Ear training, keyboard skills, chord voicing, and substitutions.

MUSC 469. Counterpoint, 20th Century. 3 Hours.
PR: MUSC 262 with a minimum grade of C- or graduate status. Twentieth Century Counterpoint.

MUSC 470A. Topics in Popular Music. 3 Hours.
PR: MUSC 271 or MUSC 272 or consent. Focused study of one or more popular music styles, traditions, or practices.

MUSC 470B. Topics in the Study of Western Art Music. 3 Hours.
PR: MUSC 271 or MUSC 272 or consent. Focused historical study in one or more traditions of western art music.

MUSC 470C. Topics in the History of Jazz. 3 Hours.
PR: MUSC 271 or MUSC 272 or consent. A focused historical and ethnographic study of one or more jazz traditions.

MUSC 470D. Topics in Music of Sub-Saharan Africa. 3 Hours.
PR: MUSC 271 or MUSC 272 or consent. An historical and/or ethnographic survey of one or more musics of Sub-Saharan Africa.

MUSC 470E. Topics in Musics of the Americas. 3 Hours.
PR: MUSC 271 or MUSC 272 or consent. An historical and/or ethnographic study of one or more musical traditions of the Americas.

MUSC 470F. Topics in Musics of East Asia. 3 Hours.
PR: MUSC 271 or MUSC 272 or consent. Historical and/or ethnographic survey of one or more musical practices associated with East Asia, including Japan, Korea, and/or China.

MUSC 470G. Topics in Musics of South Asia. 3 Hours.
PR: MUSC 271 or MUSC 272 or consent. An historical and/or ethnographic survey of one or more musical traditions of South Asia.

MUSC 470H. Topics in Gender and Sexuality in Music. 3 Hours.
PR: MUSC 271 or MUSC 272 or consent. This course addresses various topics in gender, sexuality, and music from an historical and/or ethnographic perspective.

MUSC 470I. Topics in Race and Ethnicity in Music. 3 Hours.
PR: MUSC 271 or MUSC 272 or consent. This course addresses various topics in race, ethnicity, and music from an historical and/or ethnographic perspective.

MUSC 470J. Topics in Musics of the Arab World. 3 Hours.
PR: MUSC 271 or MUSC 272 or consent. Historical and/or ethnographic survey of one or more musical styles of the Arab World.

MUSC 477. Music of Africa. 3 Hours.
Traditional music of selected areas of Africa south of the Sahara with particular reference to West Africa. The diverse musical cultures with emphasis on historical background, instruments, ensembles, forms, styles, and music in its social context.

MUSC 478. Coaching for Singers. 1,2 Hour.
PR: MUSC 126 and MUSC 226. This course consists of weekly or bi-weekly voice coaching targeted to specific repertoire. It will provide in-depth work with the details of language pronunciation, phrasing, musical traditions, and presentation.

MUSC 480S. Jazz and Commercial Music Arranging. 2 Hours.
PR: MUSC 265. Arranging jazz and commercial music for ensembles of three or more players.

MUSC 481. Arranging for Large Jazz Ensemble. 2 Hours.
PR: MUSC 480 or consent. Continuation of MUSC 480, with emphasis on arranging for big band and studio jazz ensemble.

MUSC 484. Music Residency 1. 4 Hours.
PR: Consent. Initial field placement for student teaching. Involves temporary placement (2 1/2 days a week) with K-12 music teachers for professional competence development. Students will plan, implement, reflect on, and modify experiences for student learning.

MUSC 485. Music Therapy Internship. 1 Hour.
PR: All other courses required for the major. Students will complete a minimum of 900 hours of supervised clinical training at either an American Music Therapy Association (AMTA) approved National Roster Internship Site or a University Affiliated Internship site. Students successfully completing this course will be eligible to sit for the board certification exam administered by CBMT.

MUSC 486. Capstone in Commercial Music & Technology. 3 Hours.
PR: JRL 432 and MUSC 271 and MUSC 336 and MUSC 410 and MUSC 411 and Senior Standing. Guidance as a group, individualized, or both in the preparation and completion of the final capstone project in the commercial music and music technology degree. In this course, students will develop an approach, timeline, and self-evaluative criteria for assessment for their project, and realize this project at the level of artistry and professionalism required in the field.

MUSC 487. Residency 2 Seminar. 2 Hours.
On-campus capstone seminar designed as a companion to music education students culminating semester-long teaching residency. Examination of residents' professional roles and responsibilities in K-12 music programs.

MUSC 488. Recital. 2 Hours.
(Not available for graduate credit.) To be used to fulfill the applied major graduation requirement only when the student has achieved proficiency level nine. Students who have reached level six may receive one hour credit, which may not be used to fulfill the graduation recital requirement.

MUSC 489. Music Workshops. 2 Hours.
(May be repeated for credit.).

MUSC 489A. Music Workshops. 2 Hours.
(May be repeated for credit.).

MUSC 489B. Music Workshops. 2 Hours.
(May be repeated for credit.).

MUSC 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

MUSC 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

MUSC 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

MUSC 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

MUSC 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

MUSC 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

MUSC 496. Senior Thesis. 1-3 Hours.
PR: Consent.

MUSC 497. Research. 1-6 Hours.
Independent research projects.

MUSC 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

MUSC 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological frame-work for cultural immersion and community service as well as adding to the content of the anchor course.

NAS 200. Introduction: Native American Studies. 3 Hours.
Overview of the diverse social and cultural institutions of indigenous tribal societies in North America. Historical materials provide the background for understanding the range of issues affecting contemporary tribal groups.

NAS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

NAS 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

NAS 491. Professional Field Experience. 1-6 Hours.
PR: Consent. Supervised interdisciplinary experiences focused on Native Americans. May be tribally based or related to agencies and projects serving Native Americans. This course is not open to freshman.

NAS 492. Directed Study. 1-3 Hours.
Directed study, reading and/or research.

NAS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

NAS 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

NAS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

NAS 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

NBAN 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

NBAN 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

NRSC 101. Introduction to Neuroscience. 3 Hours.
Introduction to neuroscience that includes a survey of the history of neuroscience and an intensive exploration of its sub-fields.

NRSC 191. First-Year Seminar. 3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

NRSC 201. Biological Foundations of Behavior. 4 Hours.
PR: (NRSC 101 and PSYC 101) with a minimum grade of C- in each and PR or CONC: BIOL 219 and BIOL 219L and Coreq: NRSC 201L. Introduction to the biological and psychological foundations of behavior. Survey of fundamental concepts in understanding the workings of the nervous system and resulting behavior in human and non-human animals.

NRSC 201L. Biological Foundations of Behavior Laboratory. 0 Hours.
PR: Corequisite of NRSC 201. Biological Foundations of Behavior - NRSC 201 Laboratory.

NRSC 298. Honors. 1-3 Hours.
PR: Students in the Honors Program and consent by the honors director. Independent reading, study, or research.

NRSC 485L. Neuroscience Research Laboratory Capstone. 3 Hours.
PR: BIOL 348 with a minimum grade of C-. Advanced neuroscience laboratory experience incorporating critical skills of being a research scientist, including writing grant proposals, drafting manuscripts, and presenting in a public forum. Students utilize knowledge gained throughout the neuroscience curriculum to propose, design, execute, analyze, and report an experiment with a Neuroscience focus.

NRSC 489. Independent Research Capstone. 3 Hours.
PR: BIOL 348 with a minimum grade of C-. Capstone research experience supervised by a faculty member with neuroscience expertise. Students will apply their training from throughout the neuroscience curriculum to develop a unique research project that contributes to the goals of a lab, culminating in formal written and oral presentations. This course fulfills the capstone requirement for Neuroscience Majors and provides a realistic exposure to performing scientific research.

NRSC 497. Research. 1-6 Hours.
Independent research projects.

NSCI 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

NSG 001. Nursing Experiential Learning. 50-75 Hours.
Students will not register for this course but it will show on their official transcript. Grade will be listed as CR.

NSG 100. Introduction to the Profession and Discipline of Nursing. 2 Hours.
Introduces students to the profession and discipline of nursing through the lens of history, its distinct body of knowledge, scientific principles, and foundational theories that shape nursing practice. Evidence-based practice and concepts of safe, compassionate, patient-centered care of diverse populations are emphasized throughout the course.

NSG 101. Health Navigation for the Young Adult. 3 Hours.
This course aims to address the existing gap in healthcare that leaves many young adults without adequate knowledge and skills to manage personal health and healthcare system navigation. Students in this course learn how to plan for and manage their own health and wellness, communicate with health care providers, and what to expect from health care encounters during young adulthood.

NSG 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

NSG 211. Health Assessment & Communication. 6 Hours.
PR: NSG 100 and PR or CONC: (BIOL 231 or NBAN 207 or PALM 207 or PSIO 241) with a minimum grade of C- in all. Examination of concepts, principles, and models that guide nursing practice related to physical, psychosocial, spiritual, developmental, cultural, intellectual assessment and communication across the lifespan in the classroom, simulation, and various clinical settings (4 hr. Didactic & 2 hr. Clinical).

NSG 212. Fundamentals of Nursing. 6 Hours.
PR: NSG 211 and PR or CONC: (BIOL 240 or MICB 200) and NSG 250 with a minimum grade of C- in all. Theories, concepts, principles, and processes that lay the foundation for critical thinking, nursing interventions, communication, professional role and caring in the practice of nursing. Application of the nursing process in classroom, simulation, and clinical experiences (4 hr. Didactic & 2 hr. Clinical).

NSG 250. Principles of Pharmacology. 3 Hours.
PR or CONC: NSG 211 and (BIOL 240 or MICB 200) with a minimum grade of C- in all. Principles of pharmacology emphasizing scholarly inquiry and evidence-based reasoning to insure accurate knowledge of and administration of medications to individuals and families across the lifespan. Pharmacological management is analyzed in conjunction with pathophysiology.

NSG 281. Perspectives on Caring. 3 Hours.
What does it mean to be caring? How is caring lived in the human experience? The premise of this course is that caring is a moral imperative, and essential for becoming a global citizen. From classic and contemporary works, the student will explore this concept over the past, present, and future through interpersonal, theoretical, ethical, and socio-political lenses.

NSG 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

NSG 298. Honors. 1-6 Hours.
PR: Students in the Honors Program and consent by the honors director. Independent reading, study or research.

NSG 311. Alterations in Adult Health 1. 6 Hours.
PR: NSG 212 and (MICB 200 or BIOL 240) and PR or CONC: NSG 250 with a minimum grade of C- in all. Pathophysiology and holistic nursing care of adults experiencing acute and chronic problems. Use of the nursing process to plan and provide interventions appropriate to health care needs in the clinical setting (3 hr. Didactic & 3 hr. Clinical).

NSG 312. Alterations in Adult Health 2. 6 Hours.
PR: NSG 250 and NSG 311 with a minimum grade of C- in each. Builds on NSG 311 using critical thinking and nursing process in a team based learning format, paired with clinical application, to explore holistic nursing care of adults with acute and chronic health problems (3 hr. Didactic & 3 hr. Clinical).

NSG 320. Pediatrics and Family-Centered Care. 4 Hours.
PR: NSG 250 and NSG 311 and PR or CONC: NSG 312 with a minimum grade of C- in all. Didactic and clinical experience focused on human response to alterations in health, developmental needs, and family-centered care specific to pediatric population with emphasis on the professional nursing role, evidence-based reasoning, therapeutic communications, and caring (2.5 hr. Didactic & 1.5 hr. Clinical).

NSG 330. Alterations in Mental Health and Wellbeing. 4 Hours.
PR: NSG 212 and PR or CONC: NSG 250 with a minimum grade of C- in all. Theory and Practice of professional nursing in response to complex alterations in psychosocial function and their impact on individuals, families, and communities. Classroom and clinical experiences (2.5 hr. Didactic & 1.5 hr. Clinical).

NSG 333. Ethics in Nursing. 3 Hours.
PR or CONC: (ENGL 102 or ENGL 103) with a minimum grade of C-. Analyze ethical issues throughout the decision-making process in nursing and health care situations across the lifespan.

NSG 350. Evidence-Based Practice and Nursing Scholarship. 3 Hours.
PR: NSG 212 and (STAT 201 or STAT 211 or ECON 225) with a minimum grade of C- in each. Theory, concepts, and methods of the research process intended to provide a basic understanding that is necessary for the translation of current evidence into nursing practice.

NSG 360. Professional Standards of Nursing Care. 3 Hours.
PR: NSG 212 and (ENGL 102 or ENGL 103) with a minimum grade of C- in all. Ethical decision-making in health care situations across the lifespan, including palliative and end of life care. Health care policy, legal and regulatory issues are discussed.

NSG 361. Health Assessment Across the Lifespan. 4 Hours.
Examines holistic health assessment of individuals and families across the lifespan, including physical, psychosocial, spiritual, and developmental assessment.

NSG 362. Health Promotion Across the Lifespan. 4 Hours.
PR: RN licensure. Explores theory and practice of promoting health and wellness for populations across the lifespan.

NSG 371. Basic Parish Nurse Education. 3 Hours.
Explores the nurse's role in managing care within faith communities. Focus is on dimensions of nurse's role: spiritual caregiver, health promoter, counselor, advocate, educator, care coordinator, resource agent and manager of developing practice.

NSG 372. Safety, Quality, and Information Technology. 2 Hours.
PR: RN Licensure. Examination of healthcare through information management to promote patient safety and quality of care. Emphasis on assessing and improving quality through prevention of adverse and never events.

NSG 373. Professional Leadership in Nursing. 3 Hours.
Explores foundations and theories of personal, professional, and leadership development for the baccalaureate-prepared nurse.

NSG 374. School of Nursing Simulation Experience. 2 Hours.
PR: NSG 311 with a minimum grade of C- and for nursing students with second semester Junior or Senior status. Simulated patient care experiences in a safe practice environment.

NSG 375. ACLS Elective. 1 Hour.
PR: NSG 312 with a minimum grade of C-. The Advanced Cardiovascular Life Support (ACLS) Provider Course is designed for healthcare providers who either direct or participated in the management of cardiopulmonary arrest or other cardiovascular emergencies. Through didactic and active participation in simulated cases, students will enhance their skills in the recognition and intervention of cardiopulmonary arrest, immediate post-cardiac arrest, acute arrhythmia, stroke, and acute coronary syndromes.

NSG 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

NSG 400. Spirituality and Health. 3 Hours.
In this course, students will examine the mind/body/spirit connection that occurs in the process of healing and wellness. Theories and practices of relationships between mind/body/spirit will be examined as they impact health/wellness of patients.

NSG 402. Nutrition for Nursing. 2 Hours.
PR: Senior standing in BSN program. Nutrition as a lifestyle factor is often overlooked in healthcare. Dietary intake affects human life and potentially brings on disease or helps to prevent or cure it. It is essential for nurses to understand how food and nutrients fit within lifestyle, culture, and therapeutic plans of care.

NSG 404. Tobacco Treatment. 2 Hours.
PR: Senior standing in BSN program. Tobacco use leads to various health disparities, including cancer, lung disease, cardiovascular issues, and oral problems, and is a leading cause of preventable death around the world. This course provides an overview of content needed for students to learn effective, evidence-based strategies to promote tobacco cessation. The course content also prepares the student for certification as a tobacco treatment specialist.

NSG 409. Emerging Technologies and Innovations in Healthcare. 2 Hours.
The purpose of this course will be to address the learning needs of students related to developing innovative solutions to problems encountered in patient care clinical settings. This course is designed to provide knowledge and skills related to collaborating with engineering and analytics specialists specific to the healthcare environment.

NSG 410. Women's Health and Newborn Nursing Care. 4 Hours.
PR: NSG 312 and NSG 320 and PR or CONC: NSG 411 with a minimum grade of C- in all. Human response to normal and abnormal changes in health status across the female lifespan and adaptations of the childbearing family. Provision of the holistic nursing care to women and childbearing families in the clinical area (2.5 hr. Didactic & 1.5 hr. Clinical).

NSG 411. Population Health and Healthcare Policy. 7 Hours.
PR: NSG 312 and NSG 320 and NSG 350 with a minimum grade of C- in each. Comprehensive theoretical introduction to community health nursing paired with clinical experience focused on promoting health and preventing disease in multiple populations. Culminates in a capstone project that addresses an identified community health need (3 hr. Didactic & 4 hr. Clinical).

NSG 412. Personal and Professional Leadership Development. 7 Hours.
PR: Senior status in Nursing and must be taken in the last semester of the program. Development of leadership and management skills necessary for professional nursing practice and interventions supporting multiple patients in acute-care complex systems. Classroom experiences paired with 225 hours of precepted leadership experience (2 hr. Didactic & 5 hr. Clinical).

NSG 433. Seminar 8: Professional Role Synthesis. 3 Hours.
PR: NSG 343. Emphasis is on implementation of the professional nursing role within a changing health care system. Focuses on analysis of societal, institutional and economic factors that affect the delivery of health care.

NSG 435. Cardiology for Nursing. 2 Hours.
PR: NSG 312 with a minimum grade of C- and senior standing in BSN Program. Introduction to the interpretation and treatment of cardiac arrhythmias.

NSG 443. Seminar 6: Professional Role Development. 2 Hours.
Emphasis on professional nursing role in health promotion/ risk reduction in groups/communities of vulnerable populations. Focuses on multidisciplinary team approaches to problem solving in community health.

NSG 455. Interpreting Data for Evidence-Based Nursing Care. 3 Hours.
This asynchronous online course provides RN-BSN students an introduction to the scientific method, analysis techniques, and interpretation of data as it relates to evidence-based nursing care.

NSG 460. Alterations in Adult Health 3. 4 Hours.
PR: NSG 312 and NSG 320 and NSG 330 and NSG 410 with a minimum grade of C- in each. Focuses on the professional nursing role in supporting individuals and families experiencing complex physiological alterations in health. Paired with clinical experiences supporting individuals and families in critical care settings (3 hr. Didactic & 1 hr. Clinical).

NSG 461. Healthcare Policy and Finance for Professional Nursing Practice. 3 Hours.
PR or CONC: NSG 362 with a minimum grade of C-. Fosters an appreciation for how policy drives the organization and financing of health care and shapes professional nursing practice. Issues of access to care, cost effectiveness, and quality of care are discussed and policy implications are considered.

NSG 465. Foundations of Evidence-Based Practice. 3 Hours.
PR: (ENGL 102 or ENGL 103) and PR or CONC: (STAT 201 or STAT 211 or ECON 225) with a minimum grade of C- in all. Introduces the development and application of evidence with an emphasis on the fundamental elements of the research process, appraisal of current evidence, and interpretation of evidence to improve patient outcomes.

NSG 470. Advanced Life-Saving Technologies. 2 Hours.
PR: Senior standing. This course will introduce students to advanced life-saving technologies and roles and responsibilities of intensive care team members.

NSG 471. Population Health Nursing: Theory and Interventions. 5 Hours.
PR: NSG 361 and NSG 362 with a minimum grade of C-, RN licensure, NSG 361 and NSG 362 may be taken concurrently with special approval to pursue the accelerated progression option. Concentrates on health promotion, disease and injury prevention to promote behaviors that improve the well-being and health outcomes of populations by identifying social determinants of health, available resources, and interventions.

NSG 475. Applied Research and Evidence-Based Practice. 5 Hours.
PR: NSG 465 with a minimum grade of C-, RN licensure, and must be taken in the last semester of the program. Advances the study of the evaluation, integration, and dissemination of reliable evidence from multiple sources including scientific evidence and patient/family preferences to inform practice and make clinical judgments to improve patient outcomes. This is the capstone course for the RN to BSN program.

NSG 477. NCLEX Remediation. 1-2 Hours.
PR: Consent. Course focus is on achievement of professional success by reinforcing/remediating preparation for RN NCLEX exam and enhancing NCLEX testing skills.

NSG 478. The Role of the Nurse in the Patient Experience. 2 Hours.
PR: NSG 212 with a minimum grade of C-. Didactic experience focused on exploring the nurse's role in the patient's and family's healthcare experience.

NSG 479. Care of the Hospitalized Obese Patient. 2 Hours.
PR: NSG 312 or Consent. Multifaceted approach to the care of a hospitalized obese patient. The linkage of Obesity to Metabolic Syndrome will be presented so there is clear understanding of pathologic processes. The pathophysiology of each body system will be explored and evidence based practice interventions specific to each condition will be presented.

NSG 480. Core Concepts in Gerontological Nursing. 2 Hours.
PR: NSG 211 and NSG 212 with a minimum grade of C- in each and Junior or Senior standing. Examination of patient specific concepts, nursing assessments, interventions, and models of care that guide nursing practice related to holistic care of the older adult.

NSG 481. Cardiac Nursing. 2 Hours.
PR: NSG juniors and seniors. Introduction to the interpretation and treatment of cardiac arrhythmias.

NSG 482. Palliative Care Nursing. 2 Hours.
Focus is on the care of patients with chronic non-curable conditions across the life span. The course analyzes the definition of palliative care and defines the role of hospice as a part of palliative care. Cultural sensitivity and communication with palliative care patients and their families is emphasized.

NSG 483. Holistic and Integrative Nursing. 2 Hours.
PR: NSG 212 with a minimum grade of C-. Theory and principles of holistic nursing and an introduction to alternative/complementary health therapies. Experiential learning and application of content to clinical setting will be explored.

NSG 484. Care of the Diabetic Patient. 2 Hours.
PR: Consent. In-depth analysis of nursing care of the patient with diabetes.

NSG 485. Children With Complex Health Needs. 2 Hours.
PR: NSG 320 with a minimum grade of C-. The nursing care of children with complex acute and chronic health problems with a focus on decision-making using a case study problem based learning approach.

NSG 486. Comprehensive NCLEX Review. 1,2 Hour.
PR: Senior status in Nursing and must be taken in the last semester of the program. Focuses on achievement of professional success by preparing for RN licensure. Preparation for NCLEX will be the focus of this by enhancing NCLEX testing skills.

NSG 487. Movies and Mental Health. 2 Hours.
Representations of pyschopathological states in films within the context of contemporary social issues such as stigma and discrimination. Examination of personal biases towards psychiatric illnesses and how biases interfere with advocacy roles of practicing nurses.

NSG 488. Generics/Genomics in Health. 2 Hours.
Fundamentals of genetics and genomics for clinical practice with analysis of current state of the sciences and research translation. Genetic and genomic concepts within the context of current and future clinical applications, theories and therapeutics.

NSG 489. Reproductive Issues in Women. 2 Hours.
PR: NSG 310 and Nursing major. this course reviews reproductive health issues and prepares students for careers in maternal/child care. Complications, diseases, genetics, and nursing care: pre/intra and postpartum will be addressed.

NSG 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

NSG 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

NSG 496. Senior Thesis. 1-3 Hours.
PR: Consent.

NSG 497. Research. 1-6 Hours.
Independent research projects.

NSG 498. Honors. 1-3 Hours.
PR: Students in the Honors Program and consent by the honors director. Independent reading, study or research.

ORGL 200. Youth Leadership Experience. 1 Hour.
This course provides an introduction to the terminology, skills and approaches of leading small group training activities for the purpose of training youth trainers to deliver the National Youth Leadership Training Course. Through presentation, activities and guided practice students gain experience in the development and delivery of instruction for the purpose of delivering high quality youth leadership training.

ORGL 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ORGL 305. Leader Self-Development. 3 Hours.
This course provides an overview of different perspectives and approaches to Leader Self-Development. The overall objective of this course is the help students fully understand how to apply their greatest talents and strengths and to develop self-leadership capabilities in order to be more effective in leading others.

ORGL 310. Leadership and Ethical Decision Making Skills. 3 Hours.
In this course, ethical thinking strategy for decision-making and skill-based application for organizational leadership development is explored. Students will also investigate current research trends regarding ethical issues in businesses and other organizational contexts.

ORGL 320. Theories of Leadership and Organizational Change. 3 Hours.
In this course, leadership and organizational change theories required to initiate and sustain change in organizations are reviewed. Students compare, contrast and critique both seminal and modern theories and models of organizational learning, knowledge creation, and organizational capacity building.

ORGL 410. Youth Leadership Development. 3 Hours.
This course provides students with an understanding of how adolescents develop and emerge as leaders in their families, schools, organizations, and communities. The objective is to provide future and current leaders with the knowledge, skills, and experiences to develop and enhance the leadership skills and behaviors of the youth in their organizations.

ORGL 420. Nonprofit Leadership. 3 Hours.
The course is designed to help students understand the major concepts in the leadership of a nonprofit organization and will help them develop the skills to utilize this material in applied situations. Students will explore the mission of the nonprofit organization, marketing and funding, effective strategies for developing relationships and performance, and ways to enhance leadership skills.

ORGL 450. Essentials of Grant Writing. 3 Hours.
This course provides students an opportunity to gain/improve grant writing skills so they can develop competitive grant proposals focusing on the pre-award phase of the grant life cycle. Students will learn how to successfully find and analyze funding opportunities, create checklists for grants, write project narratives, develop budgets, fill out application forms, think like a reviewer, and develop complete applications.

ORGL 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ORGL 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ORGL 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ORIN 100. Orientation to STEP. 1 Hour.
Support of STEP students to make a successful transition from high school to college; develop a better understanding of the learning process including critical thinking; and acquire basic academic and personal survival skills.

ORIN 110. Orientation to EXCEL. 1 Hour.
Support for the first -year student to make a successful transition from high school to college; develop a better understanding of the learning process including critical thinking; and acquire basic academic and personal survival skills.

ORIN 151. Choosing a Major and Career. 1 Hour.
Provide guidance and clarity to students that are unsure about a major and career. Course addresses first time freshman undecided and those students that discover that their initial major or career choice does not match their personal and professional aspirations. Students will be guided through a formal assessment of their personal characteristics, consider possible career choices and identify associated majors.

ORIN 152. Learning Career Skills. 1 Hour.
To provide students with information and resources necessary to begin building a strong foundation toward “Career Readiness” and an understanding of the importance of developing a comprehensive career plan. Students will be introduced to the advantages of developing an effective resume and associated career documents and the importance of beginning to define their career goals.

ORIN 161. Exploring Career Options. 1 Hour.
This course helps students explore the career that is best for them. Students receive individual counseling as well as an opportunity to talk with career mentors.

ORIN 162. Becoming Career Ready. 1 Hour.
This course helps students identify the personal and professional skill requirements of their selected career. The course involves a mix of group explorations, one-on-one discussions, and self-improvement exercises.

ORIN 164. Finding the First Job. 1 Hour.
This class helps students develop and execute a strategy for obtaining a first job that is consistent with the student's career interests.

ORIN 165. Starting Your Career. 1 Hour.
This class helps students prepare for the issues they will encounter early in their careers.

ORIN 175. Western Europe Study Trip. 3 Hours.
Exploration of Western European (Belgium, France, Germany, Luxemburg, Netherlands) history, culture, and politics with an emphasis on relevance and links to the U.S.

ORIN 220. Leadership Development. 2 Hours.
PR: Sophomore standing. Primarily for sophomores and juniors. A practical survey of leadership techniques taught by various instructors. Major emphasis placed upon improvement of leadership abilities within the WVU campus structure and problems particular to student organizations. (Pass/fail grading only.).

ORIN 251. Preparing for Success. 1 Hour.
Inform students of the various opportunities available to them through co- and extra-curricular activities that best meet the needs of their individual career planning and professional development. Students will evaluate and select opportunities in study abroad, leadership, professional organizations and service learning that will improve their competitiveness as they prepare for the job search process.

ORIN 252. Professional Development. 1 Hour.
Provide students with knowledge, skills and the ability to successfully launch a comprehensive job search. Students will learn how to search for potential employment opportunities and to utilize the latest available job search resources. Understanding the importance of professional branding, career development, and financial planning to meet life-long goals will also be covered.

ORIN 260. Preparation for Graduate Education. 1 Hour.
This course offers a comprehensive view into the graduate school application process. Assignments will mimic those required for actual admission into graduate programs.

ORIN 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ORIN 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

ORIN 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours). Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ORIN 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ORIN 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

ORIN 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

ORIN 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ORIN 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

OTH 100. Introduction to Occupational Therapy Profession. 1 Hour.
Provides students with an introduction to the profession of occupational therapy including knowledge base, practice areas, professional education and professional organizations. Intended for pre- and non-majors.

OTH 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

OTH 201. Medical Terminology for Occupational Therapy. 1 Hour.
The study of medical terminology with a focus on how terminology is used in the field of occupational therapy.

OTH 301. Professional Foundations of OT. 2 Hours.
PR: OTH student status. Introduction to fundamentals of professional behavior for the occupational therapist. Includes units on history, communication, documentation, ethics, interdisciplinary teamwork, and licensure requirements.

OTH 302. Clinical Reasoning in OT 1. 2 Hours.
PR: MOT Student Status. Critically interpret evidenced based data, theory and frames of reference to evaluate and justify occupational therapy clinical reasoning in applied clinical and case-based contexts, integrating information from courses in the professional curriculum.

OTH 303. Functional Movement Across the Lifespan. 2 Hours.
PR: OTH student status. Including acquisition of developmental patterns, motor control, motor skill acquisition. This course also provides an overview of the effects of normative processes of aging on neuromotor patterns in occupational performance.

OTH 304. Physical Impairment and Function 1. 4 Hours.
Introduction to disease and injury and its functional implications on OT treatment. Emphasis is placed on the impact of orthopedic and general disorders on performance in areas of occupation, remediation, or compensation of these impairments.

OTH 306. Occupational Performance Eval 1. 4 Hours.
PR: MOT Student Status. Standardized and non-standardized screening and assessment of occupational performance in basic and instrumental activities of daily living, work, rest and sleep, performance patterns, and contexts and environments across the lifespan.

OTH 307. Neurobiologic Foundations. 4 Hours.
PR: OTH student status. Basic and clinical applications or neuroanatomy and neurology. Includes lectures on neurophysiological basis of physical and occupational therapy practice.

OTH 308. Evaluation Procedures. 3 Hours.
PR: OTH student status. Theory and practice in evaluation procedures used by therapists. Includes Manual Muscle Test, isokinetic muscle testing, and assessment of components of movement, posture, balance, and hand function.

OTH 309. The Brain and Occupation in Occupational Therapy. 1 Hour.
Introduction to brain-behavior relationships and the study of cognitive, behavioral, and perceptual impairments that accompany common adult neurological conditions. Emphasis is on these impairments and the manner in which they impact human occupation and societal participation.

OTH 310. Critical Reasoning in Occupational Therapy. 3 Hours.
An introduction to critical reasoning analysis, and review relevant to Occupational Therapy. Students will critically analyze research articles and editorials specific to Occupational Therapy, in combination with additional writing assignments.

OTH 311. Anatomic Foundations of OT. 4 Hours.
PR: OTH Student Status. A study of the anatomical foundations of human occupational performance and movement. Emphasis is placed on understanding how impairments and disruption of anatomical structures impacts occupational performance.

OTH 312. Functional Kinesiology in Occupational Therapy. 2 Hours.
PR: OTH Student Status. Study of movement used in occupational performance using of the principles of kinesiology including statics, dynamics, and biomechanics. Emphasis on conducting functional movement analyses of occupational performance.

OTH 321. Development Life Tasks. 3 Hours.
PR: OTH student status. Life-span human development across cognitive, psychosocial and neuromotor domains with particular emphasis on applications to physical or occupational therapy interventions. Includes focus on cultural influences in health and illness.

OTH 325. Interventions Across the Lifespan 2. 4 Hours.
PR: OTH 304 with a minimum grade of C- and MOT Student Status. Intervention planning of occupational performance in instrumental activities of daily living, work, education, social participation, performance patterns, and contexts and environments across the lifespan.

OTH 330. Clinical Reasoning Foundations. 2 Hours.
PR: MOT Student Status. Critically interpret evidenced based data, theory and frames of reference to evaluate and justify occupational therapy clinical reasoning in applied clinical and case-based contexts, integrating information from courses in the professional curriculum.

OTH 360. Scientific Inquiry for OT 1. 3 Hours.
PR: MOT Student Status. Integrates student prior knowledge of research process into the scholarship of the profession. Survey methodological considerations in the design of research, ways of evaluating research and practice, and ethical considerations in research.

OTH 361. Scientific Inquiry for OT 2. 3 Hours.
PR: OTH 360 with a minimum grade of C- and OT Student Status. Advances understanding of theory-based research, methodological considerations in the design of research, ways of evaluating practice, and approaches to analyzing qualitative and quantitative data. Along with Scientific Inquiry for OT 1 provides the foundation for the students to launch their scholarly projects.

OTH 370. Theories and Science of Occupation. 3 Hours.
PR: MOT Student Status. Introduction and understanding of the concepts of occupation, occupational science and history of occupational therapy, students will learn to view the world through an occupational lens. Introduction to the process of theory development and basic theories from occupational therapy and a variety of related fields including psychology, sociology, anthropology, and how they are applied to understand human occupation.

OTH 384. Level 1 Fieldwork 1. 1,2 Hour.
Clinical instruction in the occupational therapy process. OT documentation, basic measurement skills, experiences with people with disabilities, and participation in professional activities. (Grading will be pass/fail.).

OTH 385. Level 1 Fieldwork 2. 1,2 Hour.
PR: OTH student status. Optional third short-term fieldwork experience, minimum 40 hours. Student will assist in collaboration of learning objectives. (Grading will be pass/fail.).

OTH 386. Level 1 Fieldwork 3. 1,2 Hour.
PR: OTH student status. Students will be provided with fieldwork experiences in occupational therapy processes. (Grading will be pass/fail.).

OTH 387. Level 1 Fieldwork 4. 1,2 Hour.
Clinical instruction in the occupational therapy process, OT documentation, basic evaluation and assessment skills, experiences with people with disabilities, and participation in professional activities.

OTH 400. Assistive Technology Practicum. 3 Hours.
PR: OTH 402 with a minimum grade of C- and consent. Students will learn through engaging in hands-on service at the West Virginia Department of Education's annual summer camp for assistive technology, Camp Gizmo. During the camp experience, students will be partnered with AT professionals who will guide the practicum experience.

OTH 401. Physical Impairment and Function 2. 4 Hours.
PR: OTH 304 and OTH student status. Study of neurological injury and its functional implications on occupations. Emphasis is placed on evaluation of performance in areas of occupation and performance skills and remediation, or compensation of these limitations or impairments.

OTH 402. Principles of Assistive Technology. 3 Hours.
PR: OTH 321 or PR or CONC: SPED 304 or DISB 380 with a minimum grade of C-. Covers the potential of assistive technology to enhance the lives of persons with disabilities. The course provides an overview of common AT application will discuss growing trends in the field.

OTH 403. Intro to Pediatrics in OT. 2 Hours.
PR: OTH 303 and OTH 321. Orientation to pediatric practice. Examines pediatric development beginning in utero, treatment techniques, standardized and non-standardized pediatric evaluations, documentation, and programming.

OTH 405. Upper Extremity Rehabilitation. 3 Hours.
PR: OTH 407 and OTH student status. Provides a holistic approach to occupational therapy evaluation and treatment of the upper extremity including common diagnoses and appropriate interventions including physical agent modalities, occupation-based interventions, and splinting.

OTH 407. Upper Extremity Rehabilitation Lab. 1 Hour.
PR or CONC: OTH 405 and OTH student status. Laboratory activities that supplement and complement the material covered in OTH 405 Upper Extremity Rehabilitation. Students will assess for, design, fabricate, apply, and fit orthoses and devices. The safe and effective application of superficial thermal agents, deep thermal agents, electrotherapeutic agents, and mechanical devices will be covered.

OTH 408. Physical Impairment and Function 3. 3 Hours.
PR: OTH 304 and OTH 401 and major status. Study of chronic neurological diseases and the functional implications on occupation. Emphasis is placed on evaluation and Occupational Therapy treatment in areas of performance skills, occupations and participation. Students complete the capstone client care experience.

OTH 409. Occupational Performance Evaluation 3. 4 Hours.
PR: OTH 406 with a minimum grade of C- and MOT Student Status. Standardized and non-standardized screening and assessment of the following areas: sensory neurobehavioral, cognition, psychological/ emotional, developmental, play, leisure, social participation and education inclusive of values, beliefs, and spirituality as they impact occupational performance across the lifespan.

OTH 416. Professional Decision-Making. 2 Hours.
PR: OTH student status. Students are provided with opportunities to develop critical thinking, clinical reasoning, and decision-making skills in occupational therapy. Emphasis is on autonomous practice and referral decisions.

OTH 417. Occupational Therapy in Geriatrics. 3 Hours.
PR: OTH student status. Overview of normative aging using an occupational therapy frame of reference. Common problems of seniors are discussed.

OTH 419. Professional Values. 3 Hours.
PR: OTH student status. An introduction to ethics and how it specifically applies to rural health and life in West Virginia. Students will be given an opportunity to explore their own conceptions of ethics in health care.

OTH 423. Interventions Across the Lifespan 3. 4 Hours.
PR: OTH 325 with a minimum grade of C- and MOT Student Status. Critical reasoning, goal writing, documentation, and intervention planning on client factors and performance skills addressing neuromusculoskeletal and movement related functions, cardiovascular and respiratory functions, motor skills incorporating performance patterns, and contexts and environments across the lifespan.

OTH 430. Occupational Therapy in Mental Health. 3 Hours.
PR: OTH student status. Clinical and functional science lectures pertaining to OT practice in mental health environments. Course includes introduction to occupational therapy clinical and functional assessment, and management protocols.

OTH 431. Clinical Reasoning in OT 2. 2 Hours.
PR: MOT Student Status. Using the Occupational Therapy Practice Framework and the OT Code of Ethics, integrating occupation-based models, theory and frames of reference, students will apply principles of critical thinking to case-based problem solving. This course is designed to integrate information from prior courses in the professional curriculum.

OTH 432. Occupational Therapy Interventions in Mental Health. 3 Hours.
PR: OTH student status. Occupational therapy interventions in mental health commonly used by occupational therapists in the field of mental health. Emphasis on group processes, life skills, reintegration strategies.

OTH 435. Therapeutic Activity. 3 Hours.
PR: OTH student status. Students will develop skills in performance component analysis, performance context analysis, and occupational performance analysis.

OTH 440. Cognition and Perception in Occupational Therapy. 2 Hours.
PR: OTH student status. Study of cognitive and perceptual impairments that accompany common adult neurological conditions. Emphasis is on application of occupational therapy assessment and treatment principles to understand the impact of impairments on functional performance and societal participation.

OTH 480. Current Topics in Occupational Therapy. 1-3 Hours.
PR: OTH student status. (Not to exceed 18 hours.) A seminar course designed to provide a forum for discussing the frontiers of the occupational therapy profession. Topics may include: research in progress, new developments, and salient professional issues.

OTH 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

OTH 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

OTH 497. Research. 1-6 Hours.
Independent research projects.

PALM 100. Introduction to Laboratory Medicine. 1 Hour.
Introduces two laboratory medicine tracks (Histotechnology and Medical Laboratory Science) and provides students with an opportunity to interact with faculty members, students within, and graduates of both tracks.

PALM 101. Laboratory Medicine Pathways. 1 Hour.
Focuses on available careers and graduate school opportunities thus allowing students to meet professionals who have expanded upon their background in Histotechnology or Medical Laboratory Science.

PALM 107. Introduction to Human Anatomy and Physiology. 4 Hours.
PR: BIOL 102 and CHEM 111 and PR or CONC: BIOL 104 and CHEM 112. Survey of human anatomy and physiology for pre-nursing and other pre-clinical students. Also listed as PSIO 107.

PALM 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

PALM 200. Medical Terminology. 3 Hours.
General medical terminology with emphasis on clinical and anatomic pathology terminology.

PALM 201. Laboratory Medicine Applications. 1 Hour.
An introduction to common test procedures in Histotechnology and Medical Laboratory Science that will provide students with basic laboratory skills while exposing them to a variety of laboratory medicine disciplines and test methodologies.

PALM 205. Introduction to Human Anatomy. 3 Hours.
Introductory human anatomy course that uses a combined regional and systemic approach to examine the relationships and organization of the major structures within the thorax, abdomen, head/neck, and back/limbs regions of the body.

PALM 206. Human Anatomy Laboratory. 1-3 Hours.
Introductory human anatomy laboratory using a combined regional and systemic approach to examine the relationships and organization of the major structures with the thorax, abdomen, head/neck, and back/limb regions of the body.

PALM 207. Human Anatomy and Physiology 2. 4 Hours.
PR: PALM 107. Anatomy and Physiology with gross anatomy laboratory. Emphasis on clinical relevance for nursing.

PALM 300. Introduction to Pathology. 3 Hours.
A study of principles and processes of pathology from cellular to system, including etiology, pathogenesis, and clinical features of representative or commonly occurring disorders and diseases.

PALM 301. Principles of Human Anatomy. 3,4 Hours.
PR: Admission to WVU's dental hygiene, nursing, or pharmacy program or consent. Lectures and demonstrations on the gross and microscopic anatomy of the human body including development. Pre-requisite(s) and/or co-requisite(s) may differ on regional campuses.

PALM 302. Oral Pathology. 3 Hours.
PR: PALM 301, and dental hygiene major, or consent. Application of fundamental knowledge of general pathology to pathological conditions that occur in the oral cavity.

PALM 303. Laboratory Methods. 1 Hour.
Fundamental theoretical methods and procedures used in laboratory medicine, which include laboratory safety, patient safety, HIPAA, specimen integrity and collection, microscopy, and laboratory math.

PALM 304. Histotechnology Microanatomy. 4 Hours.
Microscopic identification of the morphology of human cells, tissues and organ systems with relationship to structure and function.

PALM 305. Staining Techniques 1. 4 Hours.
A lecture and laboratory course focusing on the theory and methodology of routine and special staining and the basic principles, components and use of instruments in the histopathology laboratory.

PALM 306. Histotechnique 1. 3 Hours.
A lecture and laboratory course focusing on the principles and theories of routine histologic techniques and the basic principles, components and use of instruments in the histopathology laboratory.

PALM 307. Introduction to Histotechniques. 1 Hour.
An introduction to routine histologic techniques, principles, use of instrumentation, and safety practices in the histopathology laboratory.

PALM 309. Oral Histology. 2 Hours.
PR: PALM 301. Histological structure and embryological development of the teeth, tissues and organs of the oral cavity. (Electronic delivery.).

PALM 312. Phlebotomy. 1 Hour.
Theory and practice of laboratory specimen processing and phlebotomy including venipuncture and capillary puncture.

PALM 320. Medical Biochemistry. 3 Hours.
PR or CONC: PALM 322. Overview of basic concepts in biochemistry and cell biology with application of these principles to human metabolism in health and disease.

PALM 322. Medical Biochemistry Laboratory. 1 Hour.
PR or CONC: PALM 320. Fundamental techniques used in laboratory medicine for the testing of carbohydrates, enzymes, lipids, and proteins.

PALM 323. Medical Microbiology Lab. 2 Hours.
PR: MICB 200. (For medical laboratory science students; other students with consent.) Emphasis is on clinical laboratory techniques and laboratory identification of pathogenic microorganisms.

PALM 329. Clinical Chemistry 1. 2 Hours.
Lectures in clinical chemistry analysis, clinical significance, clinical instrumentation, and implications of diagnosis.

PALM 340. Introduction to Hematology. 3 Hours.
Lectures and laboratory sessions to cover structure, morphology, and function of the cells of the blood, bone marrow and body fluids, with an overview of hematologic abnormalities.

PALM 350. Clinical Mycology & Parasitology. 2 Hours.
Study of clinically significant fungi and parasites that will include the morphological characteristics, pathogenicity, epidemiological characteristics, and laboratory testing.

PALM 360. Urinalysis and Body Fluids. 1 Hour.
PR or CONC: PALM 362. Comprehensive study of the renal system and bodily fluids including principles and methods of testing and associated disorders or diseases.

PALM 380. Medical Immunology. 3 Hours.
Comprehensive study of the immune system including principles of immunological and serological procedures, immunological disorders and diseases, and correlation between test results and disease states.

PALM 381. Research and Educational Methodology. 2 Hours.
Lectures in ethics, techniques of research, and techniques of educational methodology for medical laboratory science students.

PALM 382L. Medical Immunology Laboratory. 1 Hour.
Laboratory experiences in immunological and serological testing with an emphasis on the correlation between test results and disease states.

PALM 401. Phlebotomy Practicum. 1 Hour.
Supervised practicum in which students will integrate practice and theory of phlebotomy in a health care setting and will be exposed to the scope of work found in phlebotomy and specimen processing department.

PALM 405. Staining Techniques 2. 4 Hours.
PR: PALM 305. A lecture and laboratory course focusing on the theory and methodology of immunohistochemistry.

PALM 406. Histotechnique 2. 3 Hours.
PR: PALM 306. A lecture and laboratory course focusing on the principles and theories of routine and advanced histologic techniques and the basic principles, components and use of instruments in the histopathology laboratory.

PALM 407. Histology Laboratory. 8 Hours.
This course consists of rotations in clinical and research histopathology.

PALM 408. Histotechnologist Practicum. 14 Hours.
Supervised practicum in which students will integrate practice and theory of histotechnology in a healthcare setting and will be exposed to the scope of work, variety of tests, and automation found within the histopathology department.

PALM 409. Molecular Pathology for Laboratory Professionals. 2 Hours.
This course will provide students with an overview of the principles and applications of molecular techniques in pathology. A review of molecular and cancer biology will be included, and molecular pathways and biomarkers will be discussed with correlation to cancer types.

PALM 410. Molecular Diagnostics. 2 Hours.
PR or CONC: PALM 412. Principles and procedures of molecular biology that aid in the diagnosis and prognosis of disorders and disease states.

PALM 412. Molecular Diagnostics Laboratory. 1 Hour.
PR or CONC: PALM 410. Foundational molecular diagnostic testing and techniques with an emphasis on the correlation between test results and disease states.

PALM 420. Immunohematology. 3 Hours.
PR or CONC: PALM 422. Primary principles and practices of blood banking which includes blood group systems, antibody detection and identification, compatibility testing, quality control requirements, instrumentation, blood transfusion, donor selection, and component preparation.

PALM 422. Immunohematology Laboratory. 2 Hours.
PR or CONC: PALM 420. Blood banking procedures and testing which will include blood group system identification, antibody detection and identification, quality control testing, and an introduction to immunohematology instrumentation.

PALM 425. Immunohematology Practicum. 4 Hours.
PR: PALM 420 and PALM 422 with a minimum grade of C- in both. Supervised practicum in which students will integrate practice and theory of immunohematology in a health care setting and will be exposed to the scope of work, variety of tests, and automation found within the immunohematology department.

PALM 430. Clinical Chemistry. 3 Hours.
PR or CONC: PALM 432. Theory of routine and specialized clinical chemistry laboratory testing, which will include quality assurance, laboratory test principles and methodologies, and correlation between test results and disease states.

PALM 432. Clinical Chemistry Laboratory. 2 Hours.
PR or CONC: PALM 430. Principles and procedures of various tests performed in clinical chemistry with emphasis on quality control and correlation between test results and disease states.

PALM 435. Clinical Chemistry Practicum. 4 Hours.
PR: PALM 430 and PALM 432 with a minimum grade of C- in both. Supervised practicum in which students will integrate practice and theory of clinical chemistry in a health care setting and will be exposed to the scope of work, variety of tests, and automation found within the clinical chemistry department.

PALM 440. Clinical Hematology. 3 Hours.
PR or CONC: PALM 442. Study of formed elements of blood including test principles and methodologies, associated disorders and diseases, and the correlation between test results and disease states.

PALM 442. Clinical Hematology Laboratory. 2 Hours.
PR or CONC: PALM 440. Principles and procedures of hematology testing with an emphasis on the correlation between test results and disease states.

PALM 444. Hemostasis. 1 Hour.
PR or CONC: PALM 446. Study of blood hemostasis including the coagulation cascade, principles of testing, hemostatic disorders and diseases, and the correlation between test results and disease states.

PALM 445. Clinical Hematology Practicum. 4 Hours.
PR: PALM 440 and PALM 442 with a minimum grade of C- in both. Supervised practicum in which students will integrate practice and theory of clinical hematology in a health care setting and will be exposed to the scope of work, variety of tests, and automation found within the hematology department.

PALM 446. Hemostasis Laboratory. 1 Hour.
PR or CONC: PALM 444. Principles and procedures of testing performed in hemostasis with emphasis on quality control and correlation between test results and disease states.

PALM 450. Clinical Microbiology. 3 Hours.
PR or CONC: PALM 452. Study of medically significant microbiology, including normal flora and pathogens, microbial physiology, interactions between host and pathogenic microorganisms, and the clinical and epidemiological consequences of these interactions.

PALM 452. Clinical Microbiology Laboratory. 2 Hours.
PR or CONC: PALM 450. Basic laboratory techniques of clinical microbiology, which includes conventional microscopic, cultural, and immunologic techniques used for the isolation and identification of microorganisms that are pathogenic to humans.

PALM 455. Clinical Microbiology Practicum. 4 Hours.
PR: PALM 450 and PALM 452 with a minimum grade of C- in both. Supervised practicum in which students will integrate practice and theory of clinical microbiology in a health care setting and will be exposed to the scope of work, variety of tests, and automation found within the clinical microbiology department.

PALM 462. Urinalysis and Body Fluids Laboratory. 1 Hour.
PR or CONC: PALM 360. Practice of analyzing urine and other body fluids with an emphasis on the correlation between test results and disease states.

PALM 464. Scientific Writing Seminar. 1 Hour.
PR: Admission to WVU Medical Laboratory Science Program or consent of course instructor. Methods and principles of scientific writing focused on laboratory practices in preparation for the capstone experience.

PALM 465. Medical Laboratory Management. 2 Hours.
Laboratory organization and principles of laboratory management.

PALM 466. Med Lab Science Review. 1 Hour.
PR: Admission to WVU Medical Laboratory Science Program or consent of course instructor. Emphasis on review and integration of medical laboratory science principles in preparation for successful completion of the national board examination.

PALM 475. Medical Relevance - Capstone. 3 Hours.
Case studies of pathologic entities encountered in the medical laboratory and a review of medical laboratory science. Student will complete and give an oral presentation of the Capstone experience and pass a comprehensive examination.

PALM 480. Clinical Immunology. 2 Hours.
PR: Open only to MLS majors. Lectures in principles of immunological and serological procedures, immunological diseases, and significance of laboratory methods for diagnosis.

PALM 481. Clinical Immunology Laboratory. 1 Hour.
Clinical laboratory practice in immunological procedures. Emphasis on basic serological techniques, protein analysis, molecular methods, and tissue typing.

PASS 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

PASS 293. Special Topics. 1-6 Hours.
Investigation of topics not covered in regularly scheduled courses.

PASS 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

PASS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PATH 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

PATH 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

PATH 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PATH 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

PATH 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

PATH 496. Senior Thesis. 1-3 Hours.
PR: Consent.

PATH 498. Honors. 1-3 Hours.
PR: Students in the Honors Program and consent by the honors director. Independent reading, study, or research.

PCOL 260. Pharmacology. 3 Hours.
Interactions of clinically useful therapeutic agents with the mammalian systems.

PCOL 449. Drugs and Medicine. 3 Hours.
PR: ANPH 301 or BIOL 235 or EXPH 365 or PSIO 241 or consent. Introduction for interested students to information about drugs and pharmaceutical preparations including administration, mechanisms, therapeutic and adverse effects, drug interactions, and drug abuse.

PE 101. Badminton. 1 Hour.
Introduction to beginning knowledge and skills in badminton. (May be repeated for a maximum of 2 credit hours).

PE 103. Beginning Basketball. 1 Hour.
This course is designed to provide historical background, rules and regulations, and fundamental skills. These will be accomplished through instruction, drills, games and class team play. (May be repeated for a maximum of 2 credit hours).

PE 104. Intermediate Basketball. 1 Hour.
Introduction to intermediate knowledge and skills in basketball. (May be repeated for a maximum of 2 credit hours).

PE 105. Rifle Conditioning and Weight Training. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to basic conditioning and weight training techniques for rifle.

PE 106. Rowing Conditioning/Weight Training. 1 Hour.
(May be repeated for a maximum of 2 credit hours). This course is designed to present students with hands-on approach to proper techniques of strength and conditioning as it applies to rowing athletes.

PE 107. Basketball Conditioning/Weight Training. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to basic conditioning and weight training techniques for basketball.

PE 108. Football Conditioning/Weight Training. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to basic conditioning and weight training techniques for football.

PE 109. Baseball Conditioning/Weight Training. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to basic conditioning and weight training techniques for baseball.

PE 110. Military Physical Conditioning. 1 Hour.
(May be repeated for a maximum of 2 credit hours).

PE 111. Air Force Military Physical Conditioning. 1 Hour.
Introduction to basic conditioning techniques for military training. (May be repeated for a maximum of 2 credit hours).

PE 112. Gymnastics Conditioning/Weight Training. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to basic conditioning and weight training techniques for gymnastics.

PE 113. Soccer Conditioning/Weight Training. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to basic conditioning and weight training techniques for soccer.

PE 114. Tennis Conditioning/Weight Training. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to basic conditioning and weight training techniques for tennis.

PE 115. Volleyball Conditioning/Weight Training. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to basic conditioning and weight training techniques for volleyball.

PE 116. Wrestling Conditioning/Weight Training. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to basic conditioning and weight training techniques for wrestling.

PE 117. Golf Conditioning and Weight Training. 1 Hour.
This strength and conditioning course is an introduction to safety, technique, skill, and physical fitness involved in sports specific strength training and conditioning.

PE 118. Swim Conditioning/Weight Training. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to basic conditioning and weight training techniques for swimming.

PE 119. Track and Field Weight Conditioning. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to basic weight training techniques for track and field.

PE 120. Canoeing. 1 Hour.
(May be repeated for a maximum of 2 credit hours). PR: Swimming skill. Types of canoeing strokes, life-saving techniques for recreational canoeing.

PE 121. Zumba. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Fuses various fast and slow Latin rhythms and movements with resistance training to create dynamic fitness routine, balance, and introduces breathing techniques to increase energy and focus.

PE 122. Billiards. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in billiards.

PE 124. Fitness Walking. 1 Hour.
(May be repeated for a maximum of 2 credit hours). This course provides a supervised walking program in a safe, enjoyable environment. Classes meet ACSM guidelines for safe, effective classes. Includes warm-up, cardiovascular segment, cool-down, and stretch.

PE 125. Group Fitness. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in aerobics.

PE 126. Aquatic Aerobics. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in aquatic aerobics.

PE 129. Spinning. 1 Hour.
(May be repeated for a maximum of 2 credit hours). This course provides a supervised, indoor cycling program in a safe, enjoyable environment. Classes meet ACSM (American College of Sports Medicine) guidelines for safety and effectiveness. Includes a warm-up, cardiovascular segment, cool-down, and stretch.

PE 130. Flag Football. 1 Hour.
Introduction to beginning knowledge and skills in flag football. (May be repeated for a maximum of 2 credit hours).

PE 131. Frisbee. 1 Hour.
Introduction to beginning knowledge and skills in frisbee. (May be repeated for a maximum of 2 credit hours).

PE 133. Beginning Archery. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in archery.

PE 135. Horsemanship 1. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in horsemanship.

PE 136. Horsemanship 2. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to intermediate and advanced knowledge in horsemanship.

PE 137. Ice Skating. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in ice skating.

PE 143. Intermediate Ice Skating. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to intermediate/advanced knowledge and skills in ice skating. For students with some previous skating experience.

PE 145. Karate. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in karate.

PE 146. Self-Defense. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in self-defense.

PE 149. Tae Kwon Do. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in tae kwon do.

PE 150. Martial Arts Fitness. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in martial arts fitness.

PE 151. Advanced Tae Kwon Do. 1 Hour.
(May be repeated for a maximum of 2 credit hours). This course builds on the techniques learned in PE 149, and introduces additional skills into practice and free sparring.

PE 152. Beginning Kickboxing. 1 Hour.
(May be repeated for a maximum of 2 credit hours). An introduction to the popular martial art and competitive sport of kickboxing. Emphasis is given to building flexibility and strength, the foundations of powerful kicking and punching techniques.

PE 153. Mind-Body Fitness. 1 Hour.
(May be repeated for a maximum of 2 credit hours). This course introduces the student to basic yoga techniques that can be practiced as a way of developing a wide variety of sports.

PE 154. Racquetball. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in racquetball.

PE 157. Slow Pitch Softball. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in slow pitch softball.

PE 158. Indoor Soccer. 1 Hour.
Introduction to beginning knowledge and skills in indoor soccer. (May be repeated for a maximum of 2 credit hours).

PE 159. Soccer. 1 Hour.
Introduction to beginning knowledge and skills in soccer. (May be repeated for a maximum of 2 credit hours).

PE 160. Beginning Tennis. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in tennis.

PE 161. Tennis. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to basic knowledge and skills for people who are familiar with tennis.

PE 162. Intermediate Tennis. 1 Hour.
(May be repeated for a maximum of 2 credit hours.) Introduction to intermediate/ advanced knowledge and skills in tennis.

PE 164. Weight Training. 1 Hour.
Introduction to beginning knowledge and skills in weight training. (May be repeated for a maximum of 2 credit hours).

PE 165. Conditioning. 1 Hour.
Introduction to beginning knowledge and skills in conditioning. (May be repeated for a maximum of 2 credit hours).

PE 167. Floor Hockey. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Basic concepts and instructional techniques for learning floor hockey skills.

PE 168. Introductory Ice Hockey. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to knowledge and skills of Ice Hockey. Students should have some previous skating experience.

PE 169. Outdoor Navigation and Survival. 1 Hour.
(May be repeated for a maximum of 2 credit hours). The objective of this course is to provide a comprehensive overview of outdoor navigation and survival techniques.

PE 170. Volleyball. 1 Hour.
Introduction to beginning knowledge and skills in volleyball. (May be repeated for a maximum of 2 credit hours).

PE 172. Cycling Basics. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Provides a comprehensive overview of the activity of cycling. The course content will address the equipment, skills, and knowledge necessary to safely participate in the life-long activity of cycling for fitness and sport.

PE 173. Beginning Swimming. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in swimming.

PE 174. Intermediate Swimming. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to intermediate knowledge and skills in swimming.

PE 175. Lifeguard Training. 2 Hours.
(May be repeated for a maximum of 2 credit hours). Red Cross certification for lifeguards.

PE 176. Advanced Swimming. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to advanced knowledge and skills in swimming.

PE 179. Orientation to Scuba. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in scuba diving.

PE 181. Rock Climbing Basics. 1 Hour.
(May be repeated for a maximum of 2 credit hours). This course provides an overview of the activity of rock climbing. The course content will address the equipment, skills, and knowledge necessary to safely participate in the activity of rock climbing on a top-rope system.

PE 182. Bowling. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduction to beginning knowledge and skills in bowling.

PE 183. Wilderness First Aid Basics. 1 Hour.
(May be repeated for a maximum of 2 credit hours). The objective of this course is to provide students with the knowledge and skills necessary to manage emergency medical situations when they occur in a delayed-help and/or wilderness setting.

PE 184. Snow Sport Basics. 1 Hour.
(May be repeated for a maximum of 2 credit hours). The objective of this course is to provide students with a comprehensive overview of several common snow sports including downhill snow skiing, snowboarding, and Nordic skiing.

PE 187. Golf. 1 Hour.
(May be repeated for a maximum of 2 credit hours). The course is designed to introduce students to the rules, skills, and strategies involved in golf.

PE 190. Pickleball. 1 Hour.
Introduction to beginning knowledge and skills in pickleball.

PE 201. Pilates. 1 Hour.
(May be repeated for a maximum of 2 credit hours). Introduces students to basic techniques, postures, and controlled breathing designed to build core strength, improve flexibility, and increase physical fitness in a non-competitive atmosphere.

PE 202. Intermediate Yoga. 1 Hour.
(May be repeated for a maximum of 2 credit hours). PR: PE 153 or previous yoga experience. Emphasizes poses which build a combination of strength, flexibility, balance, and introduces breathing techniques to increase energy and focus. Moderately paced for students with previous yoga practice.

PE 203. Yoga for Health and Wellness. 1 Hour.
This course provides an introduction to yoga and yoga philosophy and encourages students to incorporate healthy lifestyles habits into their daily routines. This course has a positive impact on student's stress levels and outlook on life.

PE 206. Modified Indoor Tennis. 1 Hour.
Introduce students to the basic skills and techniques involved in playing Modified Indoor Tennis (Pickle ball).

PE 212. Confident City Cycling. 1 Hour.
Riding skills and crash avoidance maneuvers; how to control situations in traffic and ride confidently; bicycle maintenance; proper clothing and equipment selection; in classroom and on-bike instruction.

PE 214. Beginning Lacrosse. 1 Hour.
Introduces students to the basic skills and techniques involved in playing lacrosse.

PE 215. Intermediate Lacrosse. 1 Hour.
This course focuses on more advanced concepts and skills involved in the game of lacrosse for the experienced player.

PE 220. Striking and Field Games. 1 Hour.
This teaching games for understanding (TGfU) course is designed to introduce the students to the rules, skills, and strategies involved in playing striking and fielding games.

PE 221. Invasion Games. 1 Hour.
This teaching games for understanding(TGfU) course is designed to introduce the students to the rules, skills, and strategies involved in playing games where one invades their opponent's territory.

PE 223. Net and Wall Games. 1 Hour.
This teaching games for understanding (TGfU) course is designed to introduce the students to the rules, skills, and strategies involved in playing net and wall games.

PE 225. Dance Conditioning. 2 Hours.
The course provides the dance student with the tools to condition and maintain a healthy body. Through elementary anatomical vocabulary, basic theoretical concepts and experiential physical routines such as proper warm up and cross-training methodologies focused on dance, the student will acquire his/her own sequence and daily physical maintenance for dance.

PE 229. Fitness and Wellness. 2 Hours.
Basic concepts associated with the development and maintenance of physical activity. Exposure to local fitness opportunities. Engagement in health-promoting and wellness activities. Awareness and responsibility for the maintenance of health and physical well-being through physical activity.

PE 230. Geocaching: Modern Day Treasure Hunting. 3 Hours.
This course introduces students to the exciting world of geocaching, equipping them with the knowledge and skills to embark on adventures independently and responsibly. By blending theory and practical application, participants will develop a deep appreciation for outdoor exploration and become part of the global geocaching community.

PE 293. Special Topics. 1-6 Hours.
(May be repeated for a maximum of 2 credit hours). PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PE 493. Special Topics. 1-6 Hours.
(May be repeated for a maximum of 2 credit hours). PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PET 101. Games in American Culture. 3 Hours.
Examination of how the social history of a variety of American physical games has impacted their development and conversely how the games have impacted American society.

PET 124. Human Body: Structure and Function. 2 Hours.
Overview of the structure and function of the organ systems in the human body. Topics covered include the skeletal, muscular, nervous, digestive, respiratory, and cardiovascular systems.

PET 125. Principles of Human Movement. 2 Hours.
PR: PET 124. This course is designed to introduce prospective physical educators to the principles of human movement. Pre-requisite(s) and/or co-requisite(s) may differ on regional campuses.

PET 167. Introduction to Physical Education. 3 Hours.
Overview of physical education teaching profession including career opportunities, critical current issues/ trends, professional standards, and the professional organizations.

PET 175. Motor Development. 2 Hours.
To examine changes in human movement behavior across the lifespan, the processes that underline these changes, and the factors that contribute to those changes.

PET 215. Adapted Sports and Physical Activity for All Learners. 3 Hours.
This course examines legal frameworks, trends, and inclusive practices in adapted physical education, sport, and physical activity. Students develop strategies for designing, implementing, and evaluating instructional programs tailored to diverse needs and settings. The emphasis is on understanding disability characteristics, definitions, and behaviors, while fostering advocacy and collaboration skills to support inclusive sports and physical activity for all learners.

PET 228. Instructional Models and Curriculum in Physical Education. 3 Hours.
PR: PEK majors must earn a C- or higher in all PET prefix courses. Students completing this course will examine physical education instructional models, curriculum, and curriculum development.

PET 233. Pedagogy Theory and Application. 3 Hours.
PR: Corequisite of PET 233L and PEK majors must earn a C- or higher in all PET prefix courses. Applied pedagogical theory, including assessment, planning, design, management, and delivery of instruction in physical education settings.

PET 233L. Pre-Residency Laboratory 1. 1 Hour.
PR: Corequisite of PET 233. Pedagogy Theory and Application - PET 233 Pre-Residency 1 Laboratory.

PET 244. Motor Learning and Performance. 2 Hours.
Introduction to principles related to teaching, learning, and performance of motor skills. Emphasizes the application of knowledge to teaching and learning strategies for motor-skill acquisition.

PET 276. Adapted Physical Education. 2 Hours.
Examines legal issues and current trends in adapted physical education, and develops differential instruction strategies for designing, implementing and evaluating instructional programs for students' individual needs in schools and specialized settings, emphasizing disability characteristics, definitions, functions, and behaviors.

PET 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PET 324. Water Safety Instructorships. 2 Hours.
PR: Senior Lifesaving Certification. Teaching methods in swimming and water safety. Meet American Red Cross certification standards. Course completion carries eligibility for teaching swimming, lifesaving, and water safety.

PET 346. Teaching of Invasion Games. 3 Hours.
PR: PEK majors must earn C- or higher. Basic concepts and instructional techniques for teaching invasion games in public schools.

PET 347. Teaching of Net and Wall Games. 3 Hours.
PR: PEK majors must earn C- or higher. Basic concepts and instructional techniques for teaching net and wall games in public schools.

PET 349. Health-Optimizing Physical Education. 3 Hours.
PR: PET 124 and PET 125 and PET 167 and PET 175 and PET 244 with a minimum grade of C- in all. Introduction to the foundations and components of health-related fitness, appropriate curriculum for K-12 programming, effective teaching principles, and assessment of physical activity and fitness.

PET 350. Teaching Primary Physical Education. 2 Hours.
PR: PET 124 and PET 125 and PET 167 and PET 175 and PET 244 with a minimum grade of C- in all. This course introduces prospective physical education teachers to the unique needs and characteristics of young children. Particular emphasis will be placed on developmentally appropriate practices, effective teaching practices and principles, and observation and assessment in movement education. Students participate in clinical laboratory experiences involving young children.

PET 355. Teaching Aquatics. 1 Hour.
Basic concepts and instructional techniques for teaching aquatics in public schools. (Activity.).

PET 369. Residency 1 Teaching Elementary Physical Education. 3 Hours.
PR: PEK majors must earn C- or higher. This Residency 1 course prepares teacher candidates to plan, organize, and deliver physical education lessons to elementary-aged students. Special emphasis is placed on interacting with developmentally appropriate lesson content, learning how to teach, and assessing student learning.

PET 369L. Residency 1 Teaching Elementary Physical Education Laboratory. 1 Hour.
PR: Corequisite of PET 369. Residency 1 Teaching Elementary Physical Education Laboratory - PET 369 Laboratory.

PET 379. Teaching 3-5 Physical Education. 3 Hours.
PR: PET 228 and PET 233 and PET 349 and PR or CONC: PET 350 and PET 369 with a minimum grade of C- in all. This course enables teacher candidates to plan, organize, and conduct physical education instruction for children in 3-5. Students learn how to interact with developmentally appropriate lesson content and how to teach and assess student learning.

PET 401. Foundations of Health Education. 3 Hours.
Principles and foundations of health promotion and education including health behavior theories, health-related data sources and data use, and health-related laws and regulations. Course materials will help students develop skills required to serve as a health promotion professional in the school community. Course content prepares students for Praxis II Health Education.

PET 402. Core Concepts in Health Education. 3 Hours.
Addresses content areas for school and community health education, and healthy people 2020 related to mental and emotional health, family and social health, disease, nutrition, injury prevention, and health promotion. Course content will prepare students for Praxis II Health Education.

PET 403. Program Design, Implementation, and Evaluation for Health Educators. 3 Hours.
Focuses on health education and pedagogical skills through curriculum design, program planning, implementation, and evaluation. Students will also learn about community health and advocacy related to the unique needs of diverse school communities. Prepares students for Praxis II Health Education.

PET 410. Laboratory in Pre-School Physical Education. 1-6 Hours.
Applied clinical experience in a physical activity program, which focuses on developing the motor skills of young children. Students can choose between land-based or water-based learning environments. Open to all majors.

PET 441. Technology in Physical Education. 3 Hours.
Introduction to technology literacy with a focus on the effective use of technology in physical education settings. Application of technologies related to professional development, advocacy, planning and instruction, and assessment of student learning.

PET 441L. Pre-Residency Lab 2. 1 Hour.
PR: Corequisite of PET 441. Technology in Physical Education Pre-Residency Lab 2 - PET 441 Laboratory.

PET 445. Standards-Based Assessment in Physical Education. 3 Hours.
Students completing this course will acquire the dispositions, knowledge, and performance competencies related to standards-based measurement and evaluation of school-aged children in K-12 physical education.

PET 447. Teaching Physical Activities 3. 3 Hours.
PR: PET 124 and PET 125 and PET 167 and PET 175 and PET 244 and PR or CONC: PET 449 with a minimum grade of C- in all. Basic concepts and instructional techniques for teaching pickleball, badminton, golf and disc games in public schools.

PET 449. Teaching of Lifetime, Fitness, and Rhythmic Activities. 3 Hours.
PR: PEK majors must earn C- or higher. Basic concepts and instructional techniques for teaching lifetime, fitness, and rhythmic activities in public schools.

PET 452. Teaching Outdoor Leisure Pursuits. 3 Hours.
Basic concepts and instructional techniques for teaching backpacking, orienteering, cycling, and leisure aquatic activities in public schools.

PET 477. Adapted Sports and Physical Activity Practicum. 3 Hours.
PR: (PET 215 or PET 276) with a minimum grade of C-. A supervised practicum providing hands-on instructional experience in adapted sports and physical activity settings. Students will develop and apply skills in creating inclusive environments, adapting activities, and supporting individuals with diverse needs.

PET 487. Student Teaching: Elementary K-5 Physical Education. 5 Hours.
PR or CONC: PET 488 and PET 489 with a minimum grade of C- in each. A final, school-based practice teaching experience in elementary schools.

PET 488. Residency 2 in Physical Education. 10 Hours.
PR: PET 369 with a minimum grade of C-. Students completing Residency 2 will integrate and apply the knowledge, skills, and abilities developed throughout their program of study in the public school setting.

PET 489. Residency 2 Seminar. 2 Hours.
PR: Corequisite of PET 488. Discussions to enhance communication concerning the program's Residency 2, stimulate critical thinking about the Residency 2 experience, and assist with the edTPA submission process.

PET 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

PET 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

PET 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

PET 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PET 494. Seminar. 1-3 Hours.
PR:Consent. Presentation and discussion of topics of mutual concern to students and faculty.

PET 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

PET 496. Senior Thesis. 1-3 Hours.
PR: Consent.

PET 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

PHAR 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

PHAR 199. Orientation to Pharmacy 1-2 Hr. 1,2 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities, and opportunities.

PHAR 497. Research. 1-6 Hours.
PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation.

PHAR 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

PHIL 100. Problems of Philosophy. 3 Hours.
An elementary examination of such philosophical problems as the mind-body problem, the existence of God, freedom and determinism, and the nature of persons and their knowledge.

PHIL 120. Introduction to Ethics. 3 Hours.
Topics include the nature of the good life, whether ethics is relative or there are universal moral truths, the relationship between self- interest and morality, virtues and vices, and the nature of right and wrong.

PHIL 130. Current Moral Problems. 3 Hours.
An examination of current moral problems. Topics include some of the following: abortion, euthanasia, sexism and sexual equality, preferential treatment, animal rights, sexual morality, pornography, economic justice, paternalism, punishment, and nuclear deterrence.

PHIL 140. Historical Introduction to Philosophy. 3 Hours.
An introductory survey of the major philosophers and philosophical movements from ancient times to the present.

PHIL 147. Philosophy and Film. 3 Hours.
An introduction to philosophical questions and problems through the medium of film. Questions emphasized and films viewed will vary by semester and instructor.

PHIL 170. Introduction to Critical Reasoning. 3 Hours.
An elementary study of critical thinking and reasoning. For students who want to improve their skills in recognizing fallacious patterns of reasoning, constructing acceptable arguments, and criticizing faulty lines of reasoning.

PHIL 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

PHIL 212. Philosophy of Sport. 3 Hours.
Compare and evaluate issues, ideas and arguments on the Nature of Sport, Aesthetic value in Sport, and Ethics in Sport. The course also explores the history and language of sport as it relates to understanding Sport.

PHIL 244. History of Ancient Philosophy. 3 Hours.
PR: 3 hours in philosophy. An introduction to the philosophies of the pre-Socratics, Plato, Aristotle, the Epicureans, and the Stoics.

PHIL 248. History of Modern Philosophy. 3 Hours.
PR: 3 hours in philosophy. A study of selected writings by major philosophers of the Western world from Descartes to Kant.

PHIL 260. Introduction to Symbolic Logic. 3 Hours.
An introduction to modern symbolic logic (basically, propositional logic and the predicate calculus) for students who want to acquire the skill to represent symbolically the form of deductive arguments and to test formally for validity.

PHIL 285. Ethics Bowl. 3 Hours.
PR: PHIL 100. (May be repeated for a maximum of 9 credit hours.) Students learn skills related to researching, planning, and presenting oral and written arguments on various contemporary ethical debates. Students also prepare to compete in an ethics bowl competition.

PHIL 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PHIL 301. Metaphysics. 3 Hours.
PR: 3 hours of philosophy. Traditional problems associated with reality and experience, universals and particulars, causality, space and time, matter and mind, and the nature of the self.

PHIL 302. Theory of Knowledge. 3 Hours.
PR: 3 hours of philosophy. The nature and scope of human knowledge. Topics may include perception, belief, truth, evidence, certainty, and skepticism.

PHIL 303. Brains, Minds, and Experiments. 3 Hours.
Introduction to philosophy of mind and philosophy of science by way of reflection on neuroscientific research. Topics may include free will and neural determinism, craniometry and biases in intelligence research, neurological disorders and moral psychology, levels of neuropsychological explanation, neural mechanisms and natural kinds, methodological issues in PET and fMRI research, and the search for neural correlates of consciousness.

PHIL 306. Philosophy of Mind. 3 Hours.
PR: 3 hours of philosophy or psychology major. Topics to be selected from: the mind-body problem, psychological explanation, psychology and the neurosciences, personal identity, consciousness, artificial intelligence, mental representation, emotions intentionality, folk psychology, and other minds.

PHIL 308. Philosophy of Religion. 3 Hours.
PR: 3 hours of philosophy or religious studies interdepartmental major. Examines questions of belief in God's existence, life after death, the problem of evil, determinism and divine fore knowledge, or other topics bearing upon the nature of a religious orientation to life.

PHIL 309. Asian Philosophy. 3 Hours.
Focuses on Asian thought at its most fundamental level by examining how philosophical questions have been considered, critiqued, and compared in the major Asian traditions including Chinese, Japanese, and Tibetan.

PHIL 310. Philosophy of Science. 3 Hours.
PR: 3 hours philosophy or science major. Philosophical problems associated with the concepts and methodology of science.

PHIL 312. Philosophy of Language. 3 Hours.
PR: PHIL 100 or PHIL 120 or PHIL 130 or PHIL 140 or PHIL 170 or PHIL 212 or PHIL 260. An Introduction to the philosophical study of language focusing on questions and puzzles about reference, meaning, truth and necessity.

PHIL 313. Philosophy of Race. 3 Hours.
An examination of metaphysical and ethical questions about race. Topics may include the nature of race, social construction, the varieties of racism (personal, institutional, and systemic), racial cognition and implicit bias, the (mis)use of the concept of race in medicine and science, affirmative action, reparations, and integration.

PHIL 314. Philosophy of Sex and Gender. 3 Hours.
PR: PHIL 100 or PHIL 130 or PHIL 170 or WGST 170. An examination of historical and contemporary philosophical debates about the nature of and ethical issues related to sex, gender, and sexuality. Topics covered include the nature of biological sex, the construction of gender, historical and contemporary works in feminist philosophy, and the ethics of sexual activities such as prostitution.

PHIL 315. Free Will and Moral Responsibility. 3 Hours.
PR: 3 hours of philosophy. Examines the concept of free will and the question of whether human beings are free in a way that allows them to be responsible for their behavior. Topics include the compatibility of freedom and determinism, the relationship between free will and moral responsibility, whether social factors and psychological impairments undermine freedom and responsibility, and the relationship between responsibility and punishment.

PHIL 320. Aesthetics and Philosophy of Art. 3 Hours.
Examines historical and contemporary philosophical questions about the nature and value of art and aesthetic sensibility. Topics may include the definition of art and aesthetic concepts like beauty and the sublime; the role of taste and interpretation in aesthetic experience; the role of art in society; issues in everyday and environmental aesthetics.

PHIL 321. Ethical Theory. 3 Hours.
PR: 3 hours of philosophy. Topics to be selected from the following: an examination of major ethical theories, justification in ethics, moral truth, ethical skepticism, moral rights and duties, and the meaning of ethical concepts.

PHIL 323. Social and Political Philosophy. 3 Hours.
PR: 3 hours philosophy or political science major. An examination of the relationships among the individual, society and the state. Possible topics include justifications of the state, justice, rights, liberty, equality, and arguments for socialism and capitalism.

PHIL 325. Philosophy of Law. 3 Hours.
PR: 3 hours of philosophy or pre-law student. An introduction to the philosophical study of law; topics to be selected from: theories of the nature of law, legal obligation, responsibility, punishment, free speech, paternalism, legal moralism, and legal ethics.

PHIL 331. Health Care Ethics. 3 Hours.
PR: 3 hours philosophy or pre-med or health sciences student. Topics: Clinician- patient relationship, life-sustaining treatment, physician assisted death, physician-nurse conflicts, confidentiality, research, reproductive technology, abortion, maternal/fetal conflicts, genetics, rationing, and access.

PHIL 332. Environmental Ethics. 3 Hours.
PR: Prior coursework in philosophy or a major in the sciences. Examines traditional and non-traditional ethical theories concerning our moral obligations toward other humans, non-human organisms, and ecosystems. Topics include competing theories of intrinsic value (anthropocentric, biocentric, and ecocentric), justice and the global environment, and proposals to promote environmental sustainability.

PHIL 341. Philosophy and Death. 3 Hours.
PR: One previous Philosophy course. An examination of historically and philosophically significant views on the nature and significance of death. Topics may include: criteria for defining and determining death; the possibility and desirability of immortality; the rationality of fearing death; the role of death in determining life's meaning and significance; and the ethical or moral dimensions of death.

PHIL 346. History of Ethics. 3 Hours.
PR: 3 hours philosophy. An examination of such issues as the nature of the good life, the just society, and our moral responsibilities. Such major philosophers as Plato, Aristotle, Aquinas, Kant, and Mill will be studied.

PHIL 351. Topics in Medieval Philosophy. 3 Hours.
PR: 3 hours of philosophy. Introduction to the philosophies of St. Augustine, St. Thomas Aquinas, Peter Abelard, William of Occam, and other selected figures from the Medieval period.

PHIL 354. Themes in Continental Philosophy. 3 Hours.
Nineteenth and twentieth-century French and German philosophers such as Hegel, Marx, Nietzsche, Heidegger, Habermas, Sartre, Foucault, Derrida; philosophers and themes will vary.

PHIL 355. Existentialism. 3 Hours.
PR: 3 hours of philosophy or literature course in existentialism. Survey of the major existentialist thinkers.

PHIL 360. Truth, Proof, and Possibility. 3 Hours.
PR: PHIL 260. Concepts of mathematical, philosophical, and modal logic, including the proof theory, soundness and completeness of standard propositional and first order logic, trivalent and intuitionistic logics, and semantics for quantified modal logic.

PHIL 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PHIL 480. Capstone Seminar. 3 Hours.
PR: 12 Hours in Philosophy, 6 Hours of PHIL 300 or higher. Advanced philosophical investigation of selected problems and/or major philosophers.

PHIL 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

PHIL 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours). Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

PHIL 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

PHIL 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PHIL 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

PHIL 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

PHIL 496. Senior Thesis. 1-3 Hours.
PR: Consent.

PHIL 497. Research. 1-6 Hours.
Independent research projects.

PHIL 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

PHSC 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PHSC 490. Teaching Practicum. 1-3 Hours.
PR: PHYS 105 or consent. Teaching practice as a tutor or assistant. Opportunity to help teach an activity-based science course under the direction of experienced instructors. Emphasis on developing inquiry teaching skills useful for all levels of classroom instruction.

PHSC 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 Hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

PHSC 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

PHSC 496. Senior Thesis. 1-3 Hours.
PR: Consent.

PHSC 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

PHYS 101. Introductory Physics 1. 4 Hours.
PR: MATH 124 or MATH 126 or MATH 128 or MATH 129 or MATH 150 or MATH 153 or MATH 154 or MATH 155 or MATH 156 or satisfactory performance on MATH departmental placement exam and Coreq: PHYS 101L. The fundamental philosophy and principles of physics are applied to studies of mechanics, sound, heat, and thermodynamics through demonstrations, problems, and experiments. Pre-requisites and/or co-requisites may differ on regional campuses.

PHYS 101L. Introductory Physics 1 Laboratory. 0 Hours.
PR: Corequisite of PHYS 101. Introductory Physics 1 - PHYS 101 Laboratory.

PHYS 102. Introductory Physics 2. 4 Hours.
PR: PHYS 101 and PHYS 101L and Coreq: PHYS 102L. The fundamental philosophy and principles of physics are applied to studies of electricity, magnetism, optics, light, and atomic and nuclear physics through demonstrations, problems, and experiments. Pre-requisite(s) and/or co-requisite(s) may differ on regional campuses.

PHYS 102L. Introductory Physics 2 Laboratory. 0 Hours.
PR: Corequisite of PHYS 102. Introductory Physics 2 - PHYS 102 Laboratory.

PHYS 105. Conceptual Physics. 4 Hours.
PR: Corequisite of PHYS 105L. Basic principles of physics and their relationship to our modern technological society. Major topics include properties of matter, electricity, optics, motion, heat and temperature, and energy. Nonmathematical approach emphasized.

PHYS 105L. Conceptual Physics Laboratory. 0 Hours.
PR: Corequisite of PHYS 105. Conceptual Physics - PHYS 105 Laboratory.

PHYS 107. Physics of Music. 3 Hours.
For all students including those in the liberal and fine arts. (No science or music prerequisites.) The physical and psychophysical principles underlying the nature, production, transmission, reception, and reproduction of sound.

PHYS 111. General Physics 1. 4 Hours.
PR: MATH 155 or PR or CONC: MATH 154 with a minimum grade of C- in all and Coreq: PHYS 111L. Survey of classical mechanics, thermodynamics and waves.

PHYS 111L. General Physics 1 Laboratory. 0 Hours.
PR: Corequisite of PHYS 111. General Physics 1 - PHYS 111 Laboratory.

PHYS 112. General Physics 2. 4 Hours.
PR: PHYS 111 and PHYS 111L and Coreq: PHYS 112L. Survey of electricity, magnetism, and optics.

PHYS 112L. General Physics 2 Laboratory. 0 Hours.
PR: Corequisite of PHYS 112. General Physics 2 - PHYS 112 Laboratory.

PHYS 115. Physics 112 Lab Alternative. 1 Hour.
PR: PHYS 112 with a grade of C- or higher. Laboratory component of survey of electricity magnetism and optics. (This laboratory is an alternative for students who transfer PHYS 112 without a laboratory and need to complete the lab only).

PHYS 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

PHYS 199. Orientation to Physics. 1,2 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities and opportunities.

PHYS 211. Introduction to Mathematical Physics. 3 Hours.
PR: MATH 251 and PHYS 112. Review of basic calculus with application to Physics; e.g. vector calculus and Maxwell's Equations, Fourier Series and the vibrating string, eigenvalues, eigenvectors and coupled oscillators. Complex algebra, linear algebra, differential equations, practical differential equations, Bessel functions, Legendre Polynomials, and Fourier Transforms.

PHYS 290. Teaching Practicum. 1-3 Hours.

PHYS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PHYS 301. Computational Physics. 3 Hours.
PR: MATH 261 and PHYS 314. Using basic numerical techniques to gain insight into physical systems. Numerical solutions for projectile motion, chaotic systems, and motion in a gravitational field (including N-body simulations). Numerical solutions to Maxwell's equations, the diffusion equation, the wave equation, Schrodinger's equation, and the hydrogen atom. Implementation of discrete Fourier Transforms and wavelet methods for analysis of time series.

PHYS 312. Oscillations and Thermal Physics. 3 Hours.
PR: MATH 156 and PHYS 111 and PR or CONC: PHYS 112. Introduction to wave analysis of a variety of physical systems, as well as introductory thermodynamics. Topics covered include pendula, oscillatory circuits, mechanical and sound waves, Fourier series and transforms, the Doppler effect, heat transfer, gases, fluids, entropy and the basic elements of diffraction and apertures.

PHYS 314. Introductory Modern Physics. 4 Hours.
PR: PHYS 112 and MATH 156. Topics of modern physics of interest to science majors and engineers; atomic and molecular structure and spectra, solid state and nuclear physics, relativity, and elementary particles.

PHYS 321. Optics. 3 Hours.
PR: PHYS 111 and PHYS 112 and MATH 156. A basic course in physical optics covering wave mathematics, propagation, polarization, interference, and diffraction; applications in geometrical optics and selected topics in scattering and quantum optics.

PHYS 325. Atomic Physics. 3 Hours.
PR: PHYS 314. Relativistic mechanics, atomic structure, and spectra.

PHYS 326. Medical Imaging Physics. 3 Hours.
Introduces the physics of medical imaging and is intended for non-physics majors. The fundamental concepts and clinical applications of the major imaging techniques are presented. The subject matter is ideal for pre-med majors.

PHYS 331. Theoretical Mechanics 1. 3 Hours.
PR: PHYS 111 and PHYS 112 or equiv. PR or Conc: MATH 261. Scalar, vector, and tensor fields; curvilinear coordinate systems. Kinematics and dynamics of particles, systems of particles and rigid bodies.

PHYS 332. Theoretical Mechanics 2. 3 Hours.
PR or CONC: MATH 261 and PHYS 331 or equivalent. Scalar, vector, tensor fields; curvilinear coordinate systems. Lagrangian and Hamiltonian formulation. Relativistic motion.

PHYS 333. Electricity and Magnetism 1. 3 Hours.
PR: PHYS 111 and PHYS 112 or equiv. and PR or Conc.: MATH 261. Electrostatics, electrostatics in matter, magnetostatics, magnetostatics in matter.

PHYS 334. Electricity and Magnetism. 3 Hours.
PR or CONC: PHYS 333 or equiv. and MATH 261. Maxwell's equations, reflection and refraction, wave guides and cavities.

PHYS 340. Experimental Space Physics. 3 Hours.
PR: PHYS 112. Laboratory course consisting of an experimental project designed to acquaint students with current techniques for the design and construction of scientific payloads for suborbital and orbital space missions.

PHYS 341L. Advanced Physics 1 Laboratory. 3 Hours.
PR: PHYS 111 and PHYS 112 and PHYS 314. Experiments in physics designed to complement theory courses, give experience in data taking and instrumentation, and learn methods of data evaluation and error analysis. This course focuses on learning foundational lab techniques using guided experiments.

PHYS 342L. Advanced Physics Laboratory 2. 1-3 Hours.
PR: Consent. Experiments in physics designed to complement theory courses, give experience in data taking and instrumentation, and learn methods of data evaluation, error analysis, and documentation and reporting. Emphasis on developing independence in the physics laboratory.

PHYS 351. Introduction to Quantum Computing. 3 Hours.
PR: MATH 156 and PHYS 112. An overview of the foundations of quantum computing, including quantum states, qubits, superposition, measurement, entanglement, interference, and decoherence. Application of concepts to quantum computing, communication, and sensing.

PHYS 376L. Research Methods Laboratory. 3 Hours.
PR: PHYS 112 and PR or CONC: ARSC 220. An introduction to the tools and mathematics that scientists use to solve scientific problems. Mathematical modeling, experimental design, hypothesis formulation, data collection, use of statistics, reading and evaluating the scientific literature, writing and reviewing scientific papers, and oral presentation of scientific research.

PHYS 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PHYS 451. Introductory Quantum Mechanics. 3 Hours.
PR: PHYS 314 and MATH 261. Fundamental principles of quantum mechanics; state functions in position and momentum space, operators, Schrodinger's equation, applications to one-dimensional problems, approximation methods, the hydrogen atom, angular momentum and spin.

PHYS 452. Quantum Mechanics 2. 3 Hours.
PR: PHYS 451 and MATH 261. Anglar momentum operators, including spin, and time-dependent perturbation theory. Applications of quantum mechanics, including the properties of atoms (hydrogen and multi-electron atoms), molecules, solids, identical particles of atoms (hydrogen and multi-electron atoms), molecules, solids, identical particles (e.g. black-body spectrum, Bose-Einstein condensation, and the free electron gas), and quantum effects of adiabatic changes.

PHYS 461. Thermodynamics and Statistical Mechanics. 3 Hours.
PR: PHYS 314 or equiv and MATH 251. Introduction to the statistical foundations of thermodynamics; applications of the fundamental laws of thermodynamics to physical and chemical systems.

PHYS 463. Nuclear Physics. 3 Hours.
PR: PHYS 314 and MATH 251. Study of characteristic properties of nuclei and their structure as inferred from nuclear decays and reactions, leading to a knowledge of nuclear forces and models.

PHYS 471. Solid State Physics. 3 Hours.
PR: PHYS 314 or equiv and MATH 251. Properties of crystalline solids; includes crystal structure, interatomic binding, lattice vibrations, electron theory of metals, and the band theory of solids with some applications.

PHYS 481. Plasma Physics. 3 Hours.
PR: PHYS 111 and PHYS 112 and PR or Conc: PHYS 334. Introductory course in the physics of ionized gases; particle and fluid treatment of plasmas, waves, equilibrium and stability, kinetic theory, and nonlinear effects.

PHYS 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

PHYS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 Hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

PHYS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PHYS 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

PHYS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

PHYS 496. Senior Thesis. 1-3 Hours.
PR: Consent.

PHYS 497. Research. 1-6 Hours.
PR: Consent. Independent research projects.

PHYS 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

PLSC 105. Plants and People: Past and Present. 3 Hours.
A course focused on exploring the interaction between plants and humans, and the impact plants have had, and have on human society.

PLSC 140. Sustainable Living. 3 Hours.
Explores the personal, social, economic, and environmental aspects of making sustainable choices. Sustainability principles and practices are discussed along with assessments of consumption and lifestyle decisions. Also listed as DSGN 140 and RESM 140.

PLSC 206. Principles of Plant Science. 4 Hours.
PR: Corequisite of PLSC 206L. Anatomy, morphology, and physiology of higher plants. Study of growth and development of economically important plants, their culture, and products.

PLSC 206L. Principles of Plant Science Laboratory. 0 Hours.
PR: Corequisite of PLSC 206. Principles of Plant Science - PLSC 206 Laboratory.

PLSC 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PLSC 444. Western European Gardens, Landscapes and Architecture. 6 Hours.
This is a travel course that includes visits to Belgium, France, Netherlands and Germany and focuses on a variety of environments- urban, agricultural/rural, and natural. Major cities in the travel experience may include Brussels, Paris, and Amsterdam. The core work of the course consists of a journal/sketchbook. (Also listed as LARC 444.).

PLSC 453. Organic Crop Production. 3 Hours.
PR: PLSC 206 and AGRN 202 and AGRN 203 or consent. Principles, practices, history, philosophy, and economics of organic farming and gardening. The National Organic Rule, farm certification, crop/livestock systems and international organic production. (Students may not receive credit for both PLSC 453 and PLSC 553).

PLSC 460. Plant Biochemistry. 3 Hours.
PR: (CHEM 231 or (CHEM 233 and CHEM 234)) and BIOL 219 or consent. Study of the biochemical processes and biosynthetic pathways leading to the formation of desirable plant products such as those used in food, feed, fiber, fuel and medicinal applications. (Credit cannot be received for both PLSC 460 and PLSC 560).

PLSC 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

PLSC 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

PLSC 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PLSC 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

PLSC 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

PLSC 496. Senior Thesis. 1-3 Hours.
PR: Consent.

PLSC 497. Research. 1-6 Hours.
PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PLSC 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

PLSC 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

PNGE 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

PNGE 200. Introduction to Petroleum Engineering. 3 Hours.
PR: Sophomore standing. Introduction; origin, migration, and accumulation of petroleum; reservoir fluids properties; properties of reservoir rocks; exploration; drilling technology; reservoir engineering; well completions; production engineering. Open to all students.

PNGE 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PNGE 297. Research. 1-6 Hours.
Independent Research projects.

PNGE 300. Transport Phenomena in Petroleum Engineering. 3 Hours.
PR: MAE 241. Introduction to fluid flow in pipes, two-phase flow, rotary drilling hydraulics, primary cementing jobs, flow calculations, flow measuring devices, fluid machinery, dimensional analysis, and heat transfer.

PNGE 310. Drilling Engineering. 3 Hours.
PR: SUST 101 and MAE 331 with a minimum grade of C- in each. Rock properties, functions and design considerations of rotating system, hoisting system, and circulation system; drilling fluids calculations and selections; hydraulic programs; drilling optimization; casting string design; cementing programs; and pressure control.

PNGE 312L. Drilling Fluids Laboratory. 1 Hour.
PR or CONC: PNGE 310. Topics include clay hydration, viscosity of water-based fluids, mud weight control, filtration studies, thinning agents, chemical contaminants, lime muds, polymer muds, rheological models, and liquid and solid determination.

PNGE 332. Petroleum Properties and Phase Behavior. 3 Hours.
PR: (ENGL 102 or ENGL 103) and PHYS 111 and PNGE 200. Theoretical and applied phase behavior of hydrocarbon system and hydrocarbon fluids. Applications to petroleum reservoirs and production engineering design.

PNGE 333. Basic Reservoir Engineering. 3 Hours.
PR: MAE 331 and PHYS 112. Basic properties of petroleum reservoir rocks. Fluid flow through porous materials. Evaluation of oil and gas reserves.

PNGE 400. Petroleum Engineering Ethics. 1 Hour.
PR: PNGE 450. Introduction to petroleum and natural engineering ethics and moral issues concerning safety in engineering practice as well as those arising for engineers employed by corporations. Professionalism and professional registration.

PNGE 405. Multidisciplinary Team Project. 1 Hour.
PR: PNGE 434 and PNGE 470 and PNGE 470L. Introduction to the need to seek input from other professionals, incorporate constraints imposed by other disciplines in solving petroleum and natural gas engineering design problems, and working with other professionals in a multi-disciplinary team.

PNGE 415. Well Control. 2 Hours.
PR: PNGE 310 and PR or CONC: PNGE 415L. Methods, techniques, equipment, and engineering calculations used in the control of oil and natural gas wells during drilling operations. Practical applications with rig floor simulator.

PNGE 415L. Well Control Laboratory. 1 Hour.
PR: PNGE 310 and PR or CONC: PNGE 415. Laboratory for PNGE 415.

PNGE 420. Production Engineering. 3 Hours.
PR: PNGE 310 and PNGE 332. Well completion, performance of Productive formulation, drill stem tests, completion of wells, flowing wells, gas lift methods and equipment, pumping installation design, well stimulation, emulsions, treating, gathering, and storage of oil and gas, field automation. (3 hr. lec.).

PNGE 432L. Petroleum Reservoir Engineering Laboratory. 1 Hour.
PR or CONC: PNGE 333. Laboratory evaluation of basic and special petroleum reservoir rock properties.

PNGE 434. Applied Reservoir Engineering. 3 Hours.
PR: MATH 261 and PNGE 333 and PR or Conc: STAT 215 or IENG 213. Application of reservoir engineering data to calculation of recovery potentials and prediction of reservoir performance under a variety of production methods to effect maximum conservation.

PNGE 439. Introduction to Reservoir Simulation. 3 Hours.
PR: PNGE 333. The principal objective of this course is the development of reservoir simulation theory to the level required for the construction of a three-phase, three-dimensional reservoir simulator. In addition to providing practice in developing a simulator, the course will also cover recent advances in simulation and history matching.

PNGE 441. Oil and Gas Property Evaluation. 3 Hours.
PR: PNGE 333 and (STAT 215 or IENG 213). Reserve estimation decline analysis, petroleum property evaluation, including interest calculations, cost estimation and tax evaluation. Overview investment decision analysis and computer applications in property evaluation.

PNGE 447. Introduction to Carbon Capture and Storage. 3 Hours.
PR: ENGL 102 and ENGR 101 and PNGE 200 with a minimum grade of C- in all. This course studies environmental, and economical impact of carbon capture and storage technologies, introduces different carbon capturing and storage technologies and shows how this technology can provide a long-term solution for excess carbon dioxide. This course evaluates different carbon storage sites and teaches the concept of CO2 sequestration modeling. The course presents some insights on the future of CCS technologies.

PNGE 450. Formation Evaluation. 3 Hours.
PR: PNGE 310 and PR or Conc: EE 221 or consent. Various well logging methods and related calculations with exercises in interpretation of data from actual well logs.

PNGE 460. Well Stimulation Design. 3 Hours.
PR: (MAE 243 and PNGE 420 and PNGE 333) or consent. Fundamentals of well stimulation and treatment design and their applications to low permeability formations.

PNGE 463. Horizontal Drilling. 3 Hours.
PR: MATH 261 and MAE 243 with a minimum grade of C- and PNGE 310 with a minimum grade of C. Fundamental concepts of horizontal drilling technology are introduced, which include: application of directional drilling, design of directional well trajectory, determination of well trajectory from survey data, methods and tools of controlling wellpath while drilling, calculation of torque and drag force in drill string design, application of geomechanics in directional drilling, and borehole stability analysis.

PNGE 470. Natural Gas Engineering. 3 Hours.
PR: PNGE 333 and PR or CONC: MAE 320 and PNGE 470L. Natural gas properties, compression, transmission, processing, and application of reservoir engineering principles to predict the performance and design of gas, gas-condensate, and storage reservoirs. Includes a laboratory devoted to gas measurements.

PNGE 470L. Natural Gas Engineering Laboratory. 1 Hour.
PR: PNGE 333 and PR or CONC: MAE 320 and PNGE 470. Laboratory for PNGE 470.

PNGE 471. Natural Gas Production and Storage. 3 Hours.
PR: PNGE 470 and PNGE 470L. Development of gas and gas-condensate reservoirs; design and development of gas storage fields in depleted gas, gas-condensate, oil reservoirs and aquifers.

PNGE 472. Shale Analytics. 3 Hours.
PR: PNGE 333 and PNGE 420. Combining domain expertise (reservoir and production engineering) with Artificial Intelligence and Machine Learning, this course introduces a new and realistic technology that avoids assumptions and interpretations in order to model the impact of completion, stimulation, and operational conditions on oil and gas production from the shale wells.

PNGE 480. Petroleum Engineering Design. 3 Hours.
PR: PNGE 420 and PNGE 441 and PR or CONC: PNGE 450. Comprehensive problems in design involving systems in oil and gas production, field processing, transportation, and storage.

PNGE 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

PNGE 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 Hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

PNGE 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PNGE 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

PNGE 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

PNGE 496. Senior Thesis. 1-3 Hours.
PR: Consent.

PNGE 497. Research. 1-6 Hours.
Independent research projects.

PNGE 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

POLS 102. Introduction to American Government. 3 Hours.
General survey of American national government and politics.

POLS 103. Global Political Issues. 3 Hours.
Analysis of issues in post-cold war international politics, ranging from traditional major power diplomacy and intervention to the newer problems of economic interdependence and development, human rights, population pressures on limited resources, and the environment.

POLS 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

POLS 199. Orientation to Political Science. 1,2 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities and opportunities.

POLS 210. Law and the Legal System. 3 Hours.
Introductory course on the role of law in the political system. Includes a survey of subfields in United States law and an examination of participants, processes, and policy making in the United States legal system.

POLS 220. State and Local Government. 3 Hours.
The legal basis, structure, politics and operation of state and local governments, in the content of the American federal system.

POLS 230. Introduction to Policy Analysis. 3 Hours.
Examination of the causes and consequences of public policies. Substantive policies examined include: civil rights, housing, social services, environment, health, law enforcement, education, and taxation.

POLS 240. Introduction to Public Administration. 3 Hours.
The development, organization, and processes in governmental administration in the United States.

POLS 250. Introduction to Comparative Politics. 3 Hours.
An introduction to the political and governmental systems of industrialized and developing countries. Focuses on approaches to comparative political study, political cultures and participation, and government structures, processes, and policy performance.

POLS 260. Introduction to International Relations. 3 Hours.
Theories and concepts in international politics and their application to contemporary world politics.

POLS 261. Introduction to National Security. 3 Hours.
Introduction to theories related to security studies and national security. Includes discussions of intelligence, strategy, military operations, terrorism, and civil/military affairs, along with current events.

POLS 270. Concepts in Political Theory. 3 Hours.
Introduction to political theory using texts from antiquity through modernity. Themes include citizenship, power, justice, and political obligation.

POLS 271. History of Political Thought 2. 3 Hours.
Major political philosophers and ideas of the 17th, 18th, and 19th centuries, including Hobbes, Locke, Montesquieu, Rousseau, Burke, Bentham, Mill, Hegel, and Marx.

POLS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

POLS 298. Honors. 1-3 Hours.
PR: Student in Honors Program and consent by the honors director. Independent reading, study or research.

POLS 300. Empirical Political Analysis. 3 Hours.
Designed to provide a basic understanding of how to read and conduct empirical political science research. Topics include research design, hypotheses testing, data collection, and statistical analysis. No prior knowledge of computers or statistics required.

POLS 301. Introduction to Intelligence Analysis. 3 Hours.
PR: POLS 260. A professionally-oriented survey of the history, logic, and methods of intelligence analysis as applied to policy-making in foreign policy and national security.

POLS 302. Intelligence Analysis Methods. 3 Hours.
PR: POLS 260 and POLS 301. An advanced course in the understanding and use of skills, processes, and tools currently used by intelligence analysts in the national security community.

POLS 310. American Presidency. 3 Hours.
Institutional, behavioral, and societal forces which have given rise to the modern presidency; factors which enhance and constrain the exercise of presidential power over those constituencies with which the president must interact; the nature and consequences of the presidential decision-making process; desirability and/or feasibility of reforming the presidency.

POLS 311. Political Parties & Elections. 3 Hours.
Parties and elections in America; emphasis on nomination and general election processes, campaigns, the mass media, campaign finance, voting, the electoral college, and parties in government.

POLS 313. American Constitutional Law. 3 Hours.
The role of the Constitution in the American political system. Topics include the political concept of constitutionalism; the role of the Supreme Court in the political process; division of powers among the three branches of government; and the constitutional relation between the national government and the states.

POLS 314. Civil Liberties in the United States. 3 Hours.
Issues in constitutional law concerning personal liberties against government action. Topics include free speech, press and association; religious freedoms; abortion; the right to privacy; due process of law; and criminal procedure safeguards.

POLS 315. Law and Public Policy. 3 Hours.
PR: POLS 210 or consent. Advanced examination of the role of trial courts in policymaking, including agenda-setting and policy formulation by courts, the outcomes of policy litigation, and the politics of legal reform.

POLS 316. Public Opinion and Politics. 3 Hours.
In-depth treatment of the origins, content, and impact of public opinion in American politics; political ideology, partisanship, socialization, mass media, opinion polls, and survey research techniques.

POLS 317. Interest Groups and Democracy. 3 Hours.
The role of interest groups in American politics, focusing on their distribution and internal dynamics, their involvement in campaigns and elections, their influence on public policy, and their place in a democratic system.

POLS 318. Legislative Process. 3 Hours.
Structure, organization and processes of legislative bodies; powers of the legislature; detailed study of law-making processes and procedures.

POLS 320. American Federalism and Policy. 3 Hours.
Examines the history and philosophical justification of federalism, the relationships among the federal, state and local levels of government, and the contemporary debate over what those governmental relationships should be in America today.

POLS 321. West Virginia Government. 3 Hours.
Organization and operation of the state government of West Virginia.

POLS 323. Religion & Politics. 3 Hours.
Examines how religion and religious institutions affect political outcomes and vice versa. The focus is on American politics, but the effects of religion on politics in other nations will also be discussed.

POLS 324. Sexuality, Law, and Politics. 3 Hours.
PR: Sophomore standing. Examines politically significant legal debates regarding sex, sexuality, sexual orientation, and gender identity, focusing primarily on the United States from the middle of the twentieth century to the present.

POLS 331. Criminal Law Policy and Administration. 3 Hours.
Legal and administrative approach to policy issues in criminal justice. Focuses on the criminal law, police, court decisions, and the implementation of law and policy in the criminal field.

POLS 333. Politics of Social Welfare. 3 Hours.
Questions of poverty and inequality: who are the poor; what causes economic inequality; what have been governmental and private solutions to the problem of poverty; and what successes and failures have there been in the war against poverty.

POLS 334. Politics of Economic Policy. 3 Hours.
An examination of U.S. economic policy, with an emphasis on the political considerations that influence policy development and implementation in government regulation, taxation, and spending.

POLS 335. Civil Rights, Policy, and Politics. 3 Hours.
Analysis of the law, politics, and policy related to discrimination in public accommodations, voting, education, housing and employment based on race, gender, national origin, handicapped status, and age.

POLS 336. Energy Policy and Politics. 3 Hours.
Investigates energy policy and politics from security, political economy, and environmental perspective. Focuses on various types of energy and regions of the world.

POLS 337. Gender/Politics and Policy. 3 Hours.
Comparative study of how gender differences affect politics across the world. Emphasis on advanced industrial democracies. Topics include: political attitudes and behavior, gender differences in political recruitment, and the impact of gender on public policy.

POLS 338. Environmental Policy. 3 Hours.
Explores the formulation and implementation of environmental policy, using both a policy process approach and policy analysis. Includes a discussion of the scientific, technological, risk, economic, and political variables which affect policy making in this area.

POLS 339. National Security Analysis. 3 Hours.
Introduction to the analysis of national security issues. Examines historical development of defense and military policy, arms procurement and transfers, deterrence, the application of game theory, and intelligence analysis.

POLS 340. Social Movements in Fiction and Film. 3 Hours.
In this course, students engage social movement theory through a varied selection of novels and film, which are used to illustrate abstract concepts related to political activism. The course is organized around three central themes: identity politics and activism, networked social movements, and social movement outcomes. It emphasizes liberal social movements in the American political context.

POLS 342. Bureaucratic Politics. 3 Hours.
Analysis of the nature and processes of American public administration (political, legal, economic, and social), including the role of bureaucracy in a democracy.

POLS 345. Electoral Systems and Political Parties Around the World. 3 Hours.
Analyzes electoral systems and their effects in theory and practice, addressing questions such as: What are the advantages/disadvantages of different decision rules? What are the origins and functions of political parties? By the end of the term, students should hone their skills in the research process, fact-checking, cooperative learning, and public speaking.

POLS 346. The Electoral Process. 3 Hours.
This course addresses election administration and its effects in theory and practice, asking questions such as: What are the infrastructure requirements for elections and how are they satisfied? How are ballots and other election systems designed to ensure security, privacy, and accuracy of the vote? What are the threats to election integrity and how are they mitigated?.

POLS 347. Representation. 3 Hours.
Examines the connections between voting, public opinion, representation, and policy outcomes.

POLS 348. Field Research and Community Engagement in Elections and Campaigns. 3 Hours.
Students will participate in experiential learning activities related to elections. They will participate as civic activists in get-out-the-vote efforts, campaign staffers, poll workers, or in other approved activities. Students will submit logs of their activities along with a course paper addressing the experience. The course will be treated as an independent study course.

POLS 350. Government of Japan. 3 Hours.
Survey of political institutions and governmental processes in Japan with special emphasis on the analysis of political problems in the post-war period.

POLS 351. Russian and Post-Soviet Politics. 3 Hours.
PR: POLS 250 or POLS 260. Survey of the politics and government in Russia and post-Soviet states.

POLS 352. Politics of the European Union. 3 Hours.
PR: POLS 250. Examination of the evolution of European integration and the political and institutional dynamics of the contemporary European Union.

POLS 353. Western Democratic Governments. 3 Hours.
Cross-national and/or cpimtru based analysis of selected western democracies, such as Canada, Great Britain, France, Italy, and the European Union.

POLS 354. Government of China. 3 Hours.
Survey of political institutions and governmental process in the People's Republic of China with special emphasis on the analysis of political problems since 1949.

POLS 355. Governments of Latin America. 3 Hours.
Comparative study of the government and politics of the Latin American states.

POLS 356. Politics of the Middle East. 3 Hours.
Survey of the domestic and international political dynamics of the Middle East.

POLS 357. Comparative Law and Politics. 3 Hours.
An introduction to the comparative analysis of law and politics. Examines the forms of law, legal communities, judiciaries, and justice systems of polities other than the United States.

POLS 358. Politics of Africa. 3 Hours.
Historical legacies and current political processes of tropical African countries.

POLS 359. Politics of Terrorism. 3 Hours.
Terrorism is a method used against civilian population to affect political change. To understand this, the course will examine the ideology, history and tactics used of those engaged in violence.

POLS 360. International Political Economy. 3 Hours.
Analysis of the relationship between international relations and economics. Topics include free trade, globalization, regionalism, and development.

POLS 361. International Law and Institutions. 3 Hours.
Analysis of the development of international organizations, norms, and law, as well as the creation and functioning of the United Nations and the European Union.

POLS 362. Comparative Foreign Policy. 3 Hours.
PR: POLS 260. Introduction to comparative foreign policy focused on political structures and processes in advanced industrial democracies, transitional polities, and Third World states. Includes three weeks international system simulation.

POLS 363. International Law. 3 Hours.
Law governing relations among nations, including development of rules, means of enforcement, and conflict between theory and practice.

POLS 364. American Foreign Relations. 3 Hours.
PR: POLS 260 or consent. Examination of contemporary U.S. foreign policy and its historical, cultural, and domestic political roots. Substantive and theoretical issues in understanding foreign relations since WW II, including both continuity and change in the emerging post-cold war system.

POLS 365. Foreign Policy Decision-Making. 3 Hours.
PR: POLS 260. An advanced course examining the psychological and political dynamics by which decision- making formulates foreign policy with emphasis on American national security. Includes three weeks' simulation.

POLS 368. Politics of War and Peace. 3 Hours.
PR: POLS 260 or consent. Analysis of great power politics in the international system. Examination of theories of war, historical patterns of the balance of power, and origins of the 20th century's major conflicts: WW I, WW II, and the Cold War.

POLS 369. Far East International Affairs. 3 Hours.
International relations of countries of the Far East with emphasis on historic roots of recent conflicts, the roles of the United States and other major powers, confrontation between the countries in the region, and the regional cooperation and security problems in the post-World War II period.

POLS 370. Dictatorship and Democratization. 3 Hours.
Examines the politics of authoritarian rule by focusing on dictators and their demise. Compares current scholarship with real-world accounts of a variety of dictatorships, differentiating among governing strategies and long-term impacts. Students will gain the ability to analyze trends and outcomes, as well as comprehension of different approaches to the study of dictatorship.

POLS 371. History of Political Thought 2. 3 Hours.
Major political philosophers and ideas of the 17th, 18th, and 19th centuries, including Hobbes, Locke, Montesquieu, Rousseau, Burke, Bentham, Mill, Hegel, and Marx.

POLS 373. American Political Philosophy. 3 Hours.
Major American political ideas and their influence upon American society and government from the 17th century to the present.

POLS 374. Ancient Political Thought. 3 Hours.
Focuses on ancient Greek, Roman, and near-eastern political thought, while arguing for the contemporary relevance of ancient texts.

POLS 376. Contentious Politics. 3 Hours.
This course focuses on non-institutional forms of disruptive political behavior, including public demonstrations, riots, strikes, roadblocks, terrorism, and civil war. In studying these phenomena, the course explores what fuels “claim-making,” the circumstances under which contentious political participation becomes more likely, and how movements organize. Case studies of current and recent contentious events are examined.

POLS 383. Debate. 3 Hours.
Intensive research and writing on policy options related to the annual intercollegiate debate topic. Research will focus on both the policy and political implications of enacting and implementing a variety of options.

POLS 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

POLS 450. Elections and Political Parties Around the World. 3 Hours.
Analyzes international election rules and their effects in theory and practice, addressing questions such as: How do groups make decisions? What are the advantages/disadvantages of different decision rules? What are the origins and functions of political parties? By the end of the term, students should hone their skills in the research process, fact-checking, cooperative learning, and public speaking.

POLS 452. European Union Law/Legal Systems. 3 Hours.
3 Hr. An introduction to the politics of law in Europe. Examines the forms of law, legal communities, judiciaries, and justice systems of the major European politics (Great Britain, France, and Germany.).

POLS 453. European Union Law/Institutions. 3 Hours.
3 Hr. An examination of the European Union with respect to the evolution of its legal framework, core decision making institutions, and current issues of constitutional prospects, further economic integration, and protection of human rights.

POLS 460. Gender and International Relations. 3 Hours.
PR: POLS 260. Focuses on how women affect and are affected by international conflict, development, and human rights issues, using a 'feminist' lens and methodology in studying international relations.

POLS 461. Transformation of War. 3 Hours.
The nature of war has changed significantly in the past half-century. This course examines the new aspects of violent conflict, specifically asymmetric war, insurgency, and Fourth Generation Warfare, through theory and case studies.

POLS 462. Intelligence Failures. 3 Hours.
Explores complicated attempts to understand what constitutes an intelligence failure and how policy, intelligence, and decision-makers approach these issues. Evaluates the validity of theories of intelligence failure in analyzing case studies.

POLS 484. Capstone: Build a Politics Podcast. 3 Hours.
PR: Political science major. Students work in teams to apply knowledge and skills they have gained as political science majors to creating podcast episodes that describe and explain political events or theories about politics to a broad audience. This course serves as a capstone for political science majors.

POLS 487. Capstone: Senior Paper. 3 Hours.
One of three capstone options for Political Science majors. Students choosing this option undertake a faculty-supervised independent research project culminating in a written research paper and oral presentation at a faculty/student colloquium.

POLS 488. Capstone: Political Simulation. 3 Hours.
One of three capstone options for Political Science majors. Students choosing this option conduct research and participate in role-playing exercises through planned political simulations involving both U.S. politics and international relations.

POLS 489. Capstone: Citizenship Seminar. 3 Hours.
One of three capstone options for political science majors. Students choosing this option participate in a seminar focusing on the role of citizens in a democracy, with emphasis on experimental learning through civic participation.

POLS 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

POLS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours). Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

POLS 491A. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours). Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

POLS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

POLS 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

POLS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

POLS 496. Senior Thesis. 1-3 Hours.
PR: Consent.

POLS 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

POLS 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

PORT 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PORT 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

PORT 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours). Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

PORT 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PORT 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

PORT 496. Senior Thesis. 1-3 Hours.
PR: Consent.

PORT 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

PPTH 401. General Plant Pathology. 3 Hours.
PR or CONC: PPTH 401L. Nature and causes of plant diseases; methods of control.

PPTH 401L. General Plant Pathology Laboratory. 1 Hour.
PR or CONC: PPTH 401. General Plant Pathology - PPTH 401 Laboratory.

PPTH 403. Mycology. 3 Hours.
PR: (CHEM 111 or CHEM 115) and (BIOL 101 or BIOL 115). An introduction to the biology, ecology, and classification of fungi and their impacts on human affairs.

PPTH 409. Nematology. 3 Hours.
PR: Corequisite of PPTH 409L. Nematode biology, ecology, taxonomy, and control, with particular emphasis on plant parasitic forms.

PPTH 409L. Nematology Laboratory. 0 Hours.
Coreq: PPTH 409. Nematology - PPTH 409 Laboratory.

PPTH 470. Forest Pest Management. 3 Hours.
PR or CONC: PPTH 470L. Relationship of insects and disease organisms to the forest ecosystem; recognition of agents that affect forest health; management strategies for regulating their damage. (Also listed as ENTO 470.).

PPTH 470L. Forest Pest Management Laboratory. 1 Hour.
PR or CONC: PPTH 470. Forest Pest Management - PPTH 470 Laboratory.

PPTH 471. Urban Tree and Shrub Health. 1 Hour.
PR: PPTH 470 or ENTO 470 or PPTH 401 and ENTO 404. The unique problems associated with managing trees and woody shrubs in an urban environment will be observed and discussed; management options will be evaluated. (Also listed as ENTO 471).

PPTH 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

PPTH 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

PPTH 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PPTH 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

PPTH 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

PPTH 496. Senior Thesis. 1-3 Hours.
PR: Consent.

PPTH 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

PR 215. Introduction to Public Relations. 3 Hours.
Introduces the principles of public relations. Examines the definition and historical development, opportunities and challenges, and techniques and management of public relations.

PR 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PR 301. Writing for Public Relations. 3 Hours.
PR: (JRL 101 or MDIA 101) and (PR 215 or ADV 215) with a minimum grade of C- in each and Public Relations minors only. Provides an introduction to writing for a wide range of public relations purposes. Students improve writing skills as they become prepared to effectively communicate with various audiences in multiple formats.

PR 324S. Public Relations Writing and Applications. 3 Hours.
PR: (JRL 215 or MDIA 215 or MDIA 215S) and (ADPR 215 or IMC 215 or PR 215 or STCM 215) with a minimum grade of C- in each. This course employs strategy and writing to engage various public relations audiences through the development of written public relations communication tactics such as social media releases, social media plans, media releases, public service announcements, speeches and broadcast writing. Some sections are offered as formal service learning opportunities.

PR 333S. Web Development. 3 Hours.
PR: (ADPR 215 or ADV 215 or PR 215 or STCM 215) with a minimum grade of C-. Using the web in PR campaigns, hand-coding HTML, design concepts, layout, hyperlinks, images, tables, web production software, establishing and maintenance of web server account, uploading files.

PR 347S. Martin Hall Agency: Public Relations Tactics. 3 Hours.
PR: (ADV 315 or ADV 315S or PR 324 or PR 324S or STCM 315) with a minimum grade of C-. This course is part of a student-run advertising and public relations agency designed to be the closest to a real-world professional experience as is possible in the university setting. Students will learn about the global and diverse work conducted in an agency setting, while serving in a public relations-related staff position within the Martin Hall Agency.

PR 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PR 401. Applied Public Relations. 3 Hours.
PR: (JRL 101 or MDIA 101) and (ADV 215 or PR 215) with a minimum grade of C- in each and Public Relations minors only. Covers in-depth case studies of public relations programs. Primary emphasis is placed on successful campaigns; however, unsuccessful efforts are also examined for causes of failure.

PR 410. Integrated Marketing Communications for Public Relations. 3 Hours.
PR: (JRL 101 or MDIA 101) and (ADPR 215 or ADV 215 or PR 215 or STCM 215) with a minimum grade of C- in each. Describes the essential role of public relations in integrated marketing communication. Examines successful IMC campaigns and the campaign mindset as it applies to employee relations, government affairs, reputation management, corporate social responsibility, and more.

PR 412. IMC for Sport. 3 Hours.
PR: (ADV 201 or ADPR 215 or ADV 215 or PR 215 or STCM 215) with a minimum grade of C-. Describes the essential role of public relations in integrated marketing communication using sport-specific examples to examine the attributes of successful IMC campaigns and the campaign mindset as it applies to sport promotion and communications.

PR 420S. International Public Relations. 3 Hours.
PR: (ADV 315 or ADV 315S or PR 324 or PR 324S or STCM 315) with a minimum grade of C-. This seminar-style course provides an in-depth examination of the unique challenges of global and multicultural public relations. Students learn about cultures across the world and analyze how these cultures affect international public relations practices.

PR 424S. Crisis Communication. 3 Hours.
PR: (ADV 315 or ADV 315S or PR 324 or PR 324S or STCM 315) with a minimum grade of C-. Crises can violate organization-public relationships, tarnish brands' reputations, and cause widespread human and material damages that are difficult for organizations, individuals, and communities to overcome. Ethical, evidence-based crisis communication play key roles. This course exposes students to the science and art of strategic crisis, emergency, and risk communication in a variety of contexts.

PR 426S. Advocacy Communication. 3 Hours.
This course is designed to introduce students to ethical and strategic advocacy communication practices. Students will learn practical skills commonly used to promote ideas and issues. The course takes an experiential learning approach, which means students will learn foundational concepts and professional skills through meaningful involvement in issue advocacy.

PR 428. Public Interest Communication. 3 Hours.
Public interest communication merges theory and practice to apply the art and science of strategic communication seeking widespread, sustained prosocial behavior change. Students explore science-grounded approaches toward communication in a variety of areas meaningful to society, such as public health, education, and various social movements. This course challenges and empowers students to use communication and media as responsible change agents.

PR 431. Promotion for Entertainment Media. 3 Hours.
PR: (JRL 101 or MDIA 101) and (ADPR 215 or ADV 215 or PR 215 or STCM 215) with a minimum grade of C- in each and Entertainment Media minors only. This online course offers an exploration of the foundations of entertainment promotion and the various opportunities and channels available.

PR 432. Entertainment Media Branding. 3 Hours.
PR: (JRL 101 or MDIA 101) and (ADPR 215 or ADV 215 or PR 215 or STCM 215) with a minimum grade of C- in each and Entertainment Media minors only. This course offers an examination of the issues facing entertainment brands with case studies that illuminate both successful and unsuccessful instances of entertainment branding.

PR 433. Entertainment Media Campaigns. 3 Hours.
PR: (JRL 101 or MDIA 101) and (ADPR 215 or ADV 215 or PR 215 or STCM 215) with a minimum grade of C- in each and Entertainment Media minors only. This course offers students the opportunity to apply accumulated knowledge to various real-world entertainment promotional campaigns via case studies.

PR 436. Event Planning. 3 Hours.
This course offers an exploration of the foundations of event planning including an examination of the uses and purposes of events to clients.

PR 437. Event Promotion. 3 Hours.
This course offers an examination of the issues facing events and the promotional tactics used to ensure they are successful.

PR 438. Event Execution. 3 Hours.
This course offers an application of knowledge of how events operate and an examination of what tactics can lead to success.

PR 455S. Strategic Event Planning and Promotion. 3 Hours.
PR: (ADV 315 or ADV 315S or PR 324 or PR 324S or STCM 315) with a minimum grade of C-. This course provides a hands-on introduction to special event and festival management. Students will learn how to plan, implement and evaluate special events. Students will learn foundational concepts and professional skills of event planning, coordination, sponsorship, programming, vendor management, volunteer management and risk management and will creatively apply research techniques, writing and editing skills.

PR 458. Health Public Relations. 3 Hours.
PR: (ADPR 421 or STCM 421) with a minimum grade of C- or consent. In-depth research, study, and development of active PR campaigns in the healthcare field. Students serve as the PR agency for a healthcare-related organization.

PR 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant. (Course will be graded on a pass/fail basis.).

PR 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development. (Course will be graded on a pass/fail basis.).

PR 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PR 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

PR 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

PR 496. Senior Thesis. 1-3 Hours.
PR: Consent. (Course will be graded on a pass/fail basis.).

PR 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

PSIO 107. Introduction to Human Anatomy and Physiology. 4 Hours.
PR: BIOL 102 and CHEM 111 and PR or CONC: BIOL 104 and CHEM 112. Survey of human anatomy and physiology for pre-nursing and other pre-clinical students. Also listed as NBAN 107.

PSIO 235. Anatomy and Physiology Honors Add-On. 1 Hour.
PR: Corequisite of PSIO 107. This is an HONORS ADD-ON for PSIO 107: Introduction to Human Anatomy & Physiology, an introductory level course integrating anatomy and physiology with emphasis on material appropriate for pre-nursing students. Students in this add-on are are expected to attend PSIO 107 lectures, pass exams, and engage in essay assignments by researching current and historical findings in literature and/or other media.

PSIO 241. Elementary Physiology. 4 Hours.
PR: College biology and chemistry, or consent. (For undergraduate students in paramedical sciences and nursing students on regional campuses.) Systematic presentation of basic concepts.

PSIO 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PSIO 298. Honors. 1-3 Hours.
PR: Students in the Honors Program and consent by the honors director. Independent reading, study, or research.

PSIO 441. Mechanisms of Body Function. 4 Hours.
PR: College chemistry, biology, physics, and algebra or graduate status and consent. A systematic examination of the homeostatic functions of the human body with emphasis on the physicochemical mechanisms involved. Pathophysiology and clinical correlations are introduced in relation to normal physiology. (4 hr. lec.).

PSIO 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

PSL 110. Introduction to Public Service and Leadership. 3 Hours.
Introduction to Public Service and Leadership is the introductory course for the major. Introduction of the overall goals of the major and the underlying academic disciplines to the students. Seeks to help students understand how different social groups conceptualize their social environments, and introduce the idea of leadership as a vehicle for facilitating communication between groups.

PSL 210. Community Organization and Change. 3 Hours.
PR: PSL 110. Presents and analyzes techniques to organize various types of communities and effect change in those communities. Explores the ethical and moral responsibilities and challenges to leading change for the public good.

PSL 250. Servant Leadership: The Legacy of Senator Rockefeller. 3 Hours.
Practice oriented course. Describes the characteristics and importance of servant leadership through examination of well known leaders including Sen. John D. Rockefeller IV. The impact of servant leadership on community change is examined and evaluated. Service learning component included as part of the course.

PSL 300. Assessing Policy Change. 3 Hours.
PR: PSL 210. Study of necessary tools to analyze and choose from among public policy alternatives that are relevant to the issue or problem they want to address. Additionally, students will evaluate the implementation of the policy alternative(s) they have chosen. Includes archival research in Sen. Rockefeller's papers at the WVU library.

PSL 310. Community Relations and Communication. 3 Hours.
Development of skills necessary to communicate with various audiences, with emphasis given to listening skills.

PSL 320. Program Development and Evaluation. 3 Hours.
Students identify a community issue for which a program can be developed; learn grant and fellowship writing skills to support programmatic development; and explore programmatic assessment and evaluation methodologies.

PSL 380. Internship. 3-12 Hours.
Supervised professional or research experience in a public service setting. Provides students with relevant professional experience based on their interests, skills, and knowledge within fields related to the Public Service and Leadership major. Develops professional and networking skills.

PSL 410. Capstone: Managing Change. 3 Hours.
PR: PSL 300 and PSL 380. Field research project. Integrates all the experiences accumulated during coursework and service experiences by developing and implementing a project to bring change to their community.

PSL 411. Integration of Professional Experiences. 1 Hour.
PR: PSL 380. Professional development opportunities for career preparation in the field of public service leadership.

PSYC 101. Introduction to Psychology. 3 Hours.
Survey of general psychology.

PSYC 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

PSYC 201. Psychology as a Profession. 1 Hour.
PR: PSYC 101. Orientation to opportunities for experience, employment, and graduate and professional training in psychology.

PSYC 203. Research Methods and Analysis 1. 3 Hours.
PR: PSYC 101 with a minimum grade of C- and (MATH 124 or higher with a minimum grade of D- or STAT 211 with a minimum grade of D)- and Coreq: PSYC 203L. Research methods and data analysis techniques for descriptive and correlational designs in psychology. Emphasis is placed on critically evaluating published research, as well as designing, implementing, analyzing, and reporting original studies.

PSYC 203L. Research Methods and Analysis 1 Laboratory. 0 Hours.
PR: Corequisite of PSYC 203. Research Methods and Analysis 1 - PSYC 203 Laboratory.

PSYC 204. Research Methods and Analysis 2. 3 Hours.
PR: PSYC 203 and PSYC 203L with a minimum grade of C- and Coreq: PSYC 204L. Research methods and data analysis utilizing experimental and quasi-experimental designs in developmental, experimental, clinical, and social psychology in the laboratory and the natural environment.

PSYC 204L. Research Methods and Analysis 2 Laboratory. 0 Hours.
PR: Corequisite of PSYC 204. Research Methods and Analysis 2 - PSYC 204 Laboratory.

PSYC 215. Research Exploration in Psychology. 1 Hour.
PR: PSYC 203 with a minimum grade of C-. Exploration of research experiences available in the WVU psychology department. Students will learn about the focus of various faculty research labs and specific ongoing projects through a series of discussions with graduate student and faculty researchers. Opportunities to join a research team will be emphasized.

PSYC 231. Leadership and Human Relations. 3 Hours.
PR: PSYC 101. Concentrates on principles of psychology that can be applied to improving relations with others as well as being a more effective leader. Pragmatic orientation includes using the principles to solve problems in relationships, in small organizations, and in large systems.

PSYC 232. Sex Roles and Behavior. 3 Hours.
PR: PSYC 101. Relates sex-typed behavior to physiological, social, and cultural processes. Current social concerns such as rape and abortion legislation, child care, and expanded career options for both sexes are examined from a psychological perspective.

PSYC 233. Psychology of Cinema. 3 Hours.
This course examines film from a psychological perspective. Areas of focus include the art and science of film production, and the impact of cinema on the individual and society. Analysis of psychological themes is emphasized.

PSYC 234. Drugs and Behavior. 3 Hours.
PR: PSYC 101. Behavioral, neurochemical, pharmacological, historical, legal, social, and clinical aspects of commonly used and abused psychoactive drugs.

PSYC 241. Introduction to Human Development. 3 Hours.
PR: PSYC 101. Survey of human psychological development across the life span with emphasis on change in biological, cognitive, and social-emotional processes. Special attention given to theoretical, conceptual, methodological, and practical issues.

PSYC 251. Introduction to Social Psychology. 3 Hours.
PR: PSYC 101. Examination of social interaction and behavior from a psychological perspective. Topics include: attraction, social perception and cognition, attitudes and attitude change, social influence and group process, prosocial behavior and aggression, cultural influence, and prejudice.

PSYC 281. Introduction to Psychological Disorders. 3 Hours.
PR: PSYC 101. Introduction to major categories of psychological and behavioral disorders, including mood disorders, anxiety disorders, substance-related disorders, psychotic disorders, and personality disorders. Etiology, prevention, and treatment will be discussed.

PSYC 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PSYC 298. Honors. 1-3 Hours.
PR: Students in the Honors Program and consent by the honors director. Independent reading, study, or research.

PSYC 301. Biological Foundations of Behavior. 4 Hours.
PR: WVU sections require PSYC 204 or (PSYC 101 and PR or CONC: BIOL 219 and (BIOL 219L or BIOL 220) with a minimum grade of C- in each and Coreq: PSYC 301L, WVUIT sections require PSYC 204 with a minimum grade of C- and Coreq: PSYC 301L. Introduction to the biological and psychological foundations of animal behavior. Survey of fundamental concepts (evolution, genetics, adaptation, and learning) and research methods in understanding behavioral neuroscience.

PSYC 301L. Biological Foundations of Behavior Laboratory. 0 Hours.
Coreq: PSYC 301. Biological Foundations of Behavior - PSYC 301 Laboratory.

PSYC 302. Behavior Principles. 4 Hours.
PR: PSYC 101 with a minimum grade of C- and (PSYC 204 with a minimum grade of C- or BIOL 302 or STAT 312 and Coreq: PSYC 302L and Psychology or Neuroscience majors with junior or senior standing. Principles of behavior and learning and the significance of these principles for psychological theory and application; laboratory exercises and demonstrations.

PSYC 302L. Behavior Principles Laboratory. 0 Hours.
Coreq: PSYC 302. Behavior Principles - PSYC 302 Laboratory.

PSYC 304. Critical Thinking in Psychology. 3 Hours.
PR: PSYC 101 with a minimum grade of C- and (PSYC 232 or PSYC 234 or PSYC 241 or PSYC 251 or PSYC 281). Critical thinking skills in psychology, which include the ability to recognize patterns; to engage in scientific reasoning about psychological phenomena; to adopt different perspectives when evaluating ideas or issues; and to evaluate research findings reported in psychology journals and the mass media.

PSYC 315. Professional Development. 2 Hours.
PR: PSYC 101. Expand students' awareness of careers that utilize psychological concepts. Students will integrate course concepts with the application of psychology, apply best practices for career development and evaluate their fit for various careers.

PSYC 331. History and Systems of Psychology. 3 Hours.
PR: PSYC 202 or PSYC 203 or PSYC 204 or PSYC 231 or PSYC 232 or PSYC 241 or PSYC 251 or PSYC 293 and at least junior or senior standing. A survey of psychology from its origins in philosophy, biology, and physics through the early major schools of psychological thought to modern perspectives on the science of behavior and its applications to human affairs.

PSYC 332. Multiculturalism in Psychology. 3 Hours.
PR: PSYC 101. Theoretical and empirical issues in multicultural psychology. Topics include psychological processes and impact of bias, discrimination, racism, and privilege, as well as awareness, sensitivity, and tolerance in cross-cultural interactions.

PSYC 341. Child Development. 3 Hours.
PR: PSYC 101 and PSYC 241. This course focuses on cognitive, social, and emotional developmental processes in childhood. Empirical findings in child development as well as the methods used to obtain those findings will be emphasized throughout the course.

PSYC 342. Prenatal and Infant Development. 3 Hours.
PR: PSYC 241 and junior or senior standing. Behavior and development from conception to two years. Includes behavioral genetics and hazards of prenatal development, as well as sensory motor, cognitive, language, and socioemotional behavior during infancy.

PSYC 343. Child and Adolescent Development. 3 Hours.
PR: PSYC 241 and junior or senior standing. Theory and research on major psychological processes in childhood and adolescence; maturation, personality, socialization, sensory, and cognitive development.

PSYC 344. Adolescent Development. 3 Hours.
PR: PSYC 241. This course focuses on cognitive, social, and emotional developmental processes during adolescence. Special emphasis is placed on critical evaluation of research on adolescent development.

PSYC 345. Adulthood and Aging. 3 Hours.
PR: PSYC 241 and junior or senior standing. Psychological issues in the study of adulthood, with an emphasis on the characteristics of older adults. Topics include the psychosocial and biological context of aging, cognitive and personality changes from early to late adulthood, psychopathology in later life, dementia, issues in caregiving, and death and dying.

PSYC 351. Topics in Social Psychology. 3 Hours.
PR: PSYC 251 and junior or senior standing. Social factors that determine human behavior, survey of research in selected areas of social psychology and their implications for social phenomena.

PSYC 362. Psychological Assessment. 3 Hours.
PR: PSYC 202 or PSYC 204 and at least junior standing. Psychometric theory and development of psychological assessment instruments. Includes behavioral, personality, intellectual, neuropsychological, forensic, achievement, and aptitude assessment.

PSYC 363. Personality Theory. 3 Hours.
PR: PSYC 204 with a minimum grade of C- or PSYC 304. Theoretical and empirical readings in a survey of major perspectives in personality theory, including dynamic, cognitive, humanistic, and behavioral.

PSYC 364. Psychology of Adjustment. 3 Hours.
PR: PSYC 232 or PSYC 241 or PSYC 251 or PSYC 281. Dynamic principles of human personality adjustment. Focus on life factors, including sociocultural differences, that influence behavior and experience.

PSYC 365. Forensic Psychology. 3 Hours.
PR: PSYC 101 and junior or senior standing. Surveys role of psychology in the legal system. Issues addressed include: insanity, child custody, sexual abuse, police fitness, eye witness and jury selection.

PSYC 367. Introduction to Clinical Psychology. 3 Hours.
PR: PSYC 281. Surveys field of clinical psychology, including its development, important issues regarding the training and practice of clinical psychologists, some of the politics of the profession, and future directions for the field.

PSYC 368. Ethics and Practice in Behavior Analysis. 3 Hours.
PR: PSYC 101. Introduction to ethical guidelines and practice issues in Applied Behavior Analysis. Covers the Behavior Analysis Certification Board Compliance Code, client intake and identification of the problem, behavioral assessment, and fundamental elements of behavior change.

PSYC 370. Emotions and Mood. 3 Hours.
PR: PSYC 204 with a minimum grade of C- or PSYC 304. Theories, concepts and methodologies pertaining to emotions and mood. Topics also include development and socialization of emotions, and outcomes.

PSYC 379. Community Psychology. 3 Hours.
PR: PSYC 202 or PSYC 203 or PSYC 204 or PSYC 231 or PSYC 232 or PSYC 241 or PSYC 251 and at least junior standing. Applications of learning principles to community programs. Topics may include education, youth violence, drug abuse, behavioral safety, and organizational behavior management.

PSYC 380. Health Psychology. 3 Hours.
PR: PSYC 204 with a minimum grade of C- or PSYC 304. Biological, psychological, and social perspectives on health behavior and health outcomes. Covering theoretical models of health, current health and medical management policies, and real-world examples of health issues impacting psychological well-being.

PSYC 382. Exceptional Children. 3 Hours.
PR: PSYC 241 and junior or senior standing. Children with various diagnoses and challenges, including intellectual disability, neurodivergence, behavior disorders, and mental health disorders. History, philosophical approaches to assessment and intervention, sociocultural issues, and ethical challenges will be discussed.

PSYC 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PSYC 401. Psychology Capstone Experience. 1 Hour.
PR: PSYC 101 and PSYC 201 and STAT 211 and senior standing. Experience in coursework, research, or service that integrates knowledge gained as a major in psychology. To be taken concurrently with capstone experience, details of which are to be determined in consultation with advisor.

PSYC 402. Advanced Behavior Principles. 3 Hours.
PR: PSYC 302 with a minimum grade of C-. This course will expand and deepen students' understanding of behavior principles and the assumptions, methods, and philosophy that underlie their study; teach students how to critically evaluate scientific literature in behavior analysis; and familiarize students with some interesting research problems in behavior analysis and ways in which experimenters have tried to solve these problems.

PSYC 411. Applying to Graduate School. 1 Hour.
PR: Senior psychology major. Designed to guide students through the process of applying to graduate school in psychology. Students will investigate graduate training alternatives, select potential graduate programs, complete application packages, and prepare for interviews. (Course will be graded on a pass/fail basis.).

PSYC 423. Cognition and Memory. 3 Hours.
PR: PSYC 101 with a minimum grade of C- and (PSYC 204 with a minimum grade of C- or BIOL 302 or STAT 312 and Psychology or Neuroscience majors with junior or senior standing. Theoretical and empirical issues in cognitive psychology. Topics include mechanisms and theories of attention, memory, language, and conceptual processes.

PSYC 424. Learning and Behavior Theory. 3 Hours.
PR: PSYC 302 with a minimum grade of C- and junior or senior standing. Advanced course concerned with fundamental conceptual issues in the psychology of learning and behavior.

PSYC 425. Perception. 3 Hours.
PR: (NRSC 201 or PSYC 301) with a minimum grade of C-, Psychology or Neuroscience major with junior or senior standing. Exploration of human sensory systems, focusing on anatomy and neurophysiology of the five sensory systems (vision, audition, touch, smell, and taste), as well as the cognitive processes and psychological factors that shape perceptual experience.

PSYC 426. Physiological Psychology. 3 Hours.
PR: (NRSC 201 or PSYC 301) with a minimum grade of C- and junior or senior standing. Advanced study of the physiological mechanisms of behavior. Topics include neural mechanisms of behavior and issues, methods, and findings in behavioral neuroscience.

PSYC 427. Neuroscience of Sleep. 3 Hours.
PR: (NRSC 201 or PSYC 301) with a minimum grade of C-. Exploration of human sleep, focusing on stages of consciousness, circadian rhythms, REM vs. non-REM sleep, sleep disorders, neuroscience of dreams, and development of sleep cycles.

PSYC 428. Hormones and Behavior. 3 Hours.
PR: (NRSC 201 or PSYC 301) with a minimum grade of C- and Psychology or Neuroscience major. Explores the complex interactions between the endocrine system, brain, and behavior in a broad range of animals, including people. Special emphasis is placed on reproductive hormones, as well as systems of homeostasis, aggression, and biological rhythms.

PSYC 429. Clinical Neuroscience. 3 Hours.
PR: PSYC 281 and (NRSC 201 or PSYC 301) with a minimum grade of C- in each. Advanced study of the neural substrates of psychiatric disorders including schizophrenia, mood disorders, anxiety disorders, trauma- and stressor-related disorders, substance-related and addictive disorders, and neurodevelopmental disorders.

PSYC 445. Health Disparities Across the Lifespan. 3 Hours.
PR: PSYC 241 or PSYC 251. Biological, psychological, and social perspectives on health disparities and health outcomes. Examination of the impact of discrimination on health.

PSYC 474. Applied Behavior Analysis. 3 Hours.
PR: PSYC 302 with a minimum grade of C- and junior or senior standing. The application of basic learning principles to changes in socially significant human behavior.

PSYC 480. Psychology Teaching Apprenticeship Capstone. 3 Hours.
PR: PSYC 204 with a minimum grade of C- and consent. Capstone teaching apprenticeship in a psychology course. Students will work with a psychology course instructor to develop college-level teaching and course administration skills. Students will also complete a capstone project related to teaching pedagogy or factors influencing student learning. This course focuses on development of presentation and leadership skills, and fulfills the capstone requirement for Psychology majors.

PSYC 481. Psychology Field Experience Capstone. 3 Hours.
PR: PSYC 204 with a minimum grade of C- and consent. Capstone experience involving placement at a community agency performing work relevant to psychology. Students will gain "on-the-job" experience utilizing the skills and knowledge developed in their previous coursework, while providing insight into future career options. This course fulfills the capstone requirement for Psychology majors.

PSYC 485. Psychology Research Capstone. 3 Hours.
PR: PSYC 204 with a minimum grade of C- and consent. Capstone research experience supervised by a psychology faculty member. Students will apply their training from throughout the psychology curriculum to complete a research project that contributes to the goals of a faculty research lab, culminating in formal written and oral presentations. This course provides a realistic exposure to performing scientific research and fulfills the capstone requirement for Psychology Majors.

PSYC 486. Behavior Analysis Field Experience Capstone. 1-4 Hours.
PR: PSYC 302 with a minimum grade of C-. This course provides hands-on behavior analytic experience in applied settings, opportunities to apply and receive supervision in the implementation of behavior analytic techniques in various settings: clinics, schools, medical facilities, group homes and teletherapy. The course will focus on analysis of behavior, implementation of skill acquisition programs, procedures for behavior reduction, and development of programs, graphing templates, and data collection.

PSYC 487. Behavior Analysis Research Experience. 1-4 Hours.
PR: PSYC 302 with a minimum grade of C-. This course provides hands-on behavior analytic experience in a research setting. This supervised experience will provide students with opportunities to conduct research in one or more of the following settings: human operant, animal laboratory, and applied research sites. Research activities may include recruiting participants, collecting/analyzing data, designing/implementing an experiment, assisting with literature searches, and participating in lab meetings.

PSYC 488. Psychology Honors Thesis Proposal. 3 Hours.
PR: PSYC 204 with a minimum grade of C- and consent. First in a sequence of two semester-long courses where original psychological research is performed by a student under the direction of a faculty research mentor in the Psychology Department. Focus on writing and orally defending a research proposal, as well as starting the research project in the laboratory.

PSYC 489. Psychology Honors Thesis. 3 Hours.
PR: PSYC 488 with a minimum grade of C- and consent. Second in a sequence of two semester-long courses where original psychological research is performed by a student under the direction of a faculty mentor in the Psychology Department. Students will report their research in an APA-style manuscript, complete an oral thesis defense, and present their project in a capstone poster symposium. This course fulfills the capstone requirement for Psychology Majors.

PSYC 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

PSYC 490A. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

PSYC 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experimental learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

PSYC 491A. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experimental learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

PSYC 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

PSYC 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PSYC 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regularly scheduled courses.

PSYC 495A. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regularly scheduled courses.

PSYC 497. Research. 1-6 Hours.
Independent research projects.

PSYC 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

PSYC 498A. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

PUBH 101. Introduction to Public and Community Health. 3 Hours.
This course will provide students with an overview of the principles and practice of public and community health. Students will learn about the history, core function, disciplines, and essential services of public health, as well as engage in discussions about current public health events and issues.

PUBH 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

PUBH 199. Orientation to Public Health. 1,2 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities, and opportunities.

PUBH 200. Introduction to Public Health Careers and Information. 1 Hour.
Students will explore public health careers and popular public health websites, identify and present public health data, and develop information literacy skills.

PUBH 201. Global Perspectives of Public Health. 3 Hours.
This introduction to global public health will strengthen students' perspectives and understanding of disease prevention and treatment issues in westernized and developing/underdeveloped countries. Topics include health disparities, economic/political structures/systems impacting health, maternal and child health (including family planning), socio-cultural factors affecting health care delivery and the global burden of infectious and chronic diseases, injuries and disasters.

PUBH 202. Social Determinants of Health. 3 Hours.
The purpose of this course is to provide an introduction to the social factors/determinants that influence health. Theoretical and methodological approaches to the study of social determinants will be discussed from a social ecological perspective. The course is designed to help students develop basic literacy regarding social concepts and processes that influence health status and health disparities.

PUBH 205. Writing for Public Health Audiences. 3 Hours.
PR: PUBH 101 and PUBH 202. Students will develop original written materials pertaining to current public health issues that target specific populations. They will also gain a basic understanding of health, information and functional literacy; and evaluate existing materials for literacy levels and readability.

PUBH 211. Biostatistics. 3 Hours.
PR: MATH 121 or higher. This course provides students with an introduction to statistical concepts that are important for solving real-world public health problems. This course will present statistical principles and associated scientific reasoning underlying public health practice and health policy decision-making. Topics include data visualization, summary statistics, statistical inference, and strategies for articulating and evaluating claims using statistical constructs.

PUBH 222. Epidemiology. 3 Hours.
This introductory course will provide students with a foundation in the application of epidemiologic procedures for the understanding of determinants of health-related states or events in human populations.

PUBH 230. Introduction to Health Administration. 3 Hours.
Introduces core concepts in health administration, addressing the organization of health services, administrative theories and applications, performance improvement, decision-making, managing change, and professionalism/communication in healthcare and public health administration.

PUBH 233. The US Healthcare System: Structures and Incentives. 3 Hours.
Exploration of the multifaceted US healthcare system, including its structure, delivery, and financing. Students will learn about key stakeholders within the healthcare system and how they interact with each other. Further, they will gain insight into how these interactions can inform health policy, within the state of WV and beyond.

PUBH 241. Biological Basis of Public Health. 3 Hours.
PR: PUBH 101 and ((BIOL 101 and BIOL 103) or (BIOL 102 and BIOL 104) or higher). Provides a basic understanding of human changes associated with or resulting from those chronic or infectious diseases or injuries that are of public health importance in the US and globally. Students will: 1) understand core concepts of health and disease, 2) recognize common infectious diseases and their influence on public health, and 3) identify chronic disease burden.

PUBH 243. Issues in Environmental Health. 3 Hours.
PR: PUBH 101. Provides an overview of environmental and occupational issues relating to air, water, and solid waste as they relate to human health. Basic environmental health concepts, technologies and underlying data will be examined to better understand local, national and global solutions to environmental health problems.

PUBH 258. Terminology and Communication for Health Professionals. 3 Hours.
Reviews essential skills needed for communicating with a variety of health-related professionals and lay persons, and applies these in professional, clinical, and administrative settings. The student will also become familiar with the basics of medical terminology and the fundamentals of pronunciation, and the structure of medical language and medical terms.

PUBH 260. Principles of Patient Navigation. 3 Hours.
Reviews roles and responsibilities of Patient Navigators. Provides overview of Patient Navigator competencies, comprising: the basics of health services delivery and health insurance; health of the individual; accessing and analyzing health information; approaches to communication, including motivational interviewing and group dynamics; and healthcare ethics. Includes required shadowing experience.

PUBH 293. Special Topics. 1-6 Hours.
Investigation of topics not covered in regularly scheduled courses.

PUBH 311. Health Data Management and Visualization. 3 Hours.
PR: PUBH 211. This course will provide an introduction to data management and reporting principles, and the associated tools that are instrumental in public health research. Topics include data documentation, data structure, relational database theory, data manipulation, basic logic for programming, literate programming, and reporting.

PUBH 325. Introduction to Injury Prevention. 3 Hours.
Students gain understanding of overarching topics in injury including assessing the public health impact of injuries, their causes and risk factors, and the development and assessment of appropriate interventions. Topics covered include falls, pedestrian safety, motor vehicles accidents, drug overdose, suicide, intimate partner violence, and adverse childhood experiences, all relevant to the key public health challenges affecting the United States.

PUBH 331. Introduction to Health Policy. 3 Hours.
PR: PUBH 101. This course provides an overview of the inner workings of health care policy making, from the legislative process to socioeconomic impacts, with both historical and modern perspectives. Students will explore factors that shape the United States health care system and policy, such as values, models, and stakeholders, and compare them to other countries for international context.

PUBH 333. Comparative Health Systems and Policy. 3 Hours.
PR: PUBH 331. In this course, students will examine the structure of healthcare systems in selected countries worldwide. Specific attention is paid to the developmental history of the national healthcare systems, financing, and delivery infrastructure. The impact of international relations is also examined.

PUBH 334. Emergency Preparedness for Public Health. 3 Hours.
This course provides an overview of the dimensions of disasters and emergencies through the lens of Public Health professionals with special focus on the rural environment and uses the Homeland Security Exercise Evaluation Program (HSEEP) model for the final exercise. Students completing this course will also complete several FEMA certifications during the course.

PUBH 337. Climate Change and Public Health. 3 Hours.
Anticipated changes from biodiversity loss, ozone depletion, the incidence of infectious diseases, extreme weather and climate events, ocean acidification, and sea level rise, among other concerns, will all have impacts on a wide range of human systems that affect health. Also addresses policies and technologies to reduce greenhouse gas emissions and the need for strategies for mitigation and adaptation.

PUBH 338. Public Health Project Management. 3 Hours.
Introduces students to the basics of project management: the process of initiating, planning, executing, controlling and closing out a project. Project leadership is explored in the context of building effective project teams and maintaining stakeholder relationships. Concepts include developing and monitoring budgets, developing Gantt charts, reporting, working with stakeholders, flow charts and more.

PUBH 352. Social and Behavioral Science and Practice. 3 Hours.
PR: PUBH 101 and PUBH 202. Covers history and philosophy of social and behavioral sciences, application of theory; strategies for health behavior change; and current issues in health promotion. Service learning incorporated to give students the opportunity to apply course concepts with community partners. Ten (10) service learning hours are required as an assignment by the end of the semester.

PUBH 353. Mastering Health and Wellness. 3 Hours.
This course will provide students with information about current health and wellness issues, diseases and disorders across the lifespan and how to prevent them and improve their health outcomes. Students will examine biological, psychological, and social aspects that affect and can assist in achievement of optimal health. Lecture, discussion, films, and experimental learning activities will be utilized.

PUBH 356. Worksite Wellness. 3 Hours.
Designed to be a comprehensive introduction to the field, integrating health promotion with a primary focus on population health management in a worksite setting. Covers topics such as rationale statements, programmatic models, program components addressing specific wellness topical areas, effectiveness design, implementation, reporting, and evaluation, as well as strategies to maximize employer support.

PUBH 360. Health Navigation: Prevention and Community Health. 3 Hours.
PR: PUBH 260. Students will explore the relationship between psychosocial, behavioral and biological risk factors as they affect chronic conditions; learn about screening, prevention, diagnosis and treatment for the most common chronic diseases, and discuss proven methods and strategies (including immunizations, health screenings, educational programs, behavior change programs and health policies) to promote prevention among targeted communities.

PUBH 361. Health Insurance for Patient Navigators. 3 Hours.
PR: PUBH 260. Covers basic concepts, terminology and processes pertaining to Medicaid, Medicare, worker's compensation, major insurers, and disability insurance, including eligibility, billing, claims and reimbursement. Provides the skills needed to communicate sometimes complex health insurance information to patients and facilitate patient decision making.

PUBH 393. Special Topics. 1-6 Hours.
Investigation of topics not covered in regularly scheduled courses.

PUBH 400. Field Placement Preparation Seminar. 1 Hour.
Students will coordinate plans for their field placement assignments by completing all on-boarding requirements, developing an up-to-date resume and preparing materials for field practice agencies, job searches and/or graduate school application.

PUBH 423. Introduction to Modern Epidemiologic Research. 3 Hours.
PR: PUBH 222. This intermediate course will provide students with a foundation in the research tools utilized to explore the determinants of health-related states or events (including injury and disease) in human populations.

PUBH 427. Introduction to Outbreak Investigation. 3 Hours.
Introduces the investigation of outbreaks and issues related to epidemiologic methods, surveillance, detection, and risk communication. Covers basic epidemiologic methods used to quantify and monitor potential outbreaks, data collection and management, coordination with community partners and communication to health service providers and members of the general community as part of a coordinated response.

PUBH 438. Managing Quality Improvement in Healthcare. 3 Hours.
Introduces students to the latest healthcare quality and patient safety improvement thinking through didactic sessions, interactive exercises and case studies with direct relevance for public health practitioners, healthcare administrators or clinicians. Examines healthcare quality and patient safety from a strategic viewpoint to make healthcare administrators effective decision makers.

PUBH 439. Financials Tools for Health Administration. 3 Hours.
This course introduces core concepts and tools for the financial management of healthcare organizations, including: financial management, operating revenue, working capital, and resource allocation. The critical context of health systems and health reform provides the guiding lens for the course.

PUBH 440. Health Systems Leadership. 3 Hours.
This course addresses the foundational principles of leadership, management, and collaboration for public health and healthcare settings. Topics addressed include situational and transformational leadership, leadership ethics, team leadership and self-leadership. Prepares students for entry-level leaderships roles in health services and public health organizations.

PUBH 442. Public Health in the Workplace. 3 Hours.
PR: PUBH 222 and PUBH 243. Overview of workplace health issues as they affect human health, including exposure to chemical, physical, biological and mechanical hazards. Basic occupational safety and health concepts, technologies and underlying data will be examined to better understand the potential solutions for workplace safety and human health issues.

PUBH 451. Program Evaluation in Public Health. 3 Hours.
Covers program evaluation in public health including needs assessments, formative research, process or implementation evaluation, outcomes, and impact assessments. Students will complete exercises involving the design of a logic model and an evaluation plan. The course will cover experimental, quasi-experimental, and non-experimental study designs and the use of interviews, focus groups, and survey assessments.

PUBH 454. Public Health Research Methods. 3 Hours.
PR: PUBH 222 and PUBH 352. This course provides an overview of public and community health research methods. Content includes the purpose and foundations of research, identifying and framing topic of interest and formulating research questions, ethical standards and reviews, study populations and samples, study designs, question construction and questionnaire development, data collection and analyses approaches, and the reporting and dissemination of findings.

PUBH 458. Public Mental Health. 3 Hours.
Students apply principles and methods of general epidemiology to the study of mental disorders. Provides updated scientific information regarding the epidemiology and risk factors of major psychiatric disorders such as anxiety, mood, psychotic, personality, drug and alcohol use disorders and the increased prevalence of mental disorders, cost of mental health care, and its burden on society. (co-list with 658).

PUBH 461. Legal and Ethical Issues for Patient Navigators. 3 Hours.
PR: PUBH 360 and PUBH 361. Covers the rights, responsibilities and concerns of patient navigators in the context of their roles with healthcare consumers and healthcare providers. Focuses on the social, legal, and ethical issues when interacting with patients and how to promote patient-healthcare team partnerships via improved communication and problem solving techniques. Prepares students for Patient Navigator Experiential Agency Rotations.

PUBH 462. Clinical Research Methods and Practice. 3 Hours.
Students learn research methods and techniques for application to a wide variety of cardiovascular, neurological, trauma and social services emergency care topics. Students also participate in real-time clinical research and interact with patients/potential study subjects. Also listed as PUBH 662; only one of which can be counted toward degree requirements.

PUBH 464. Ethical, Legal and Financial Issues in Healthcare. 3 Hours.
Covers the rights, responsibilities and concerns of professionals working in the healthcare arena who are not providing direct patient care but who interact with both patients and other healthcare professionals. Focuses on the social, legal, ethical, and financial issues from the patient context. Includes basic information on concepts, terminology and processes pertaining to major forms of insurance.

PUBH 465. Patient Navigation Strategies: Case Planning. 3 Hours.
PR: PUBH 360. This interactive course is designed to enable students to translate theoretical knowledge about patient navigation into practical strategies. The course is centered on modules that emphasize specific functional domains of patient navigation using a case-based approach and case scenarios. This course is Intended for students with previous patient navigation courses work or experience.

PUBH 481. Public Health Field Experience. 4 Hours.
PR: PUBH 400. Students complete a 75 hour prearranged experiential learning placement that is planned, supervised, and evaluated for credit with a local public or community health agency. Students will develop and complete outcomes and an output or product that is detailed in an affiliation agreement. Reflective journal essays and meetings to discuss observations, successes and challenges are scheduled at strategic times.

PUBH 482. Health Management Internship. 6 Hours.
PR: PUBH 400. Students complete a 125 hour prearranged internship that is planned, supervised, and evaluated for credit with a health-related agency or office. Students will develop and complete outcomes that are detailed in an affiliation agreement. Reflective journal essays and meetings to discuss observations, successes and challenges are scheduled at strategic times during the semester.

PUBH 486. Patient Navigation Agency Rotation. 4 Hours.
PR: PUBH 400. Students complete a 75 hour prearranged placement that is planned, supervised, and evaluated for credit with a clinical or health-related agency or office. Students will develop and complete outcomes that are detailed in an affiliation agreement. Reflective journal essays and meetings to discuss observations, successes and challenges are scheduled at strategic times during the semester.

PUBH 489. School of Public Health Undergraduate Capstone. 2 Hours.
PR or CONC: (PUBH 481 or PUBH 482 or PUBH 486) with a minimum grade of C-. Students demonstrate attainment of knowledge and skills in their major and area of emphasis (where applicable) through the development, practice and presentation of a poster comprising their field experience, outcomes and outputs, and reflective journal essays. The poster is presented to and evaluated by SPH stakeholders.

PUBH 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice such as a tutor or assistant.

PUBH 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

PUBH 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

PUBH 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

PUBH 496. Senior Thesis. 1-3 Hours.
PR: Consent.

PUBH 497. Research. 1-6 Hours.
Independent research projects.

RBA 293. Special Topics. 1-6 Hours.

RBA 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

RBA 493. Special Topics. 1-6 Hours.

RDNG 293. Special Topics. 1-6 Hours.
Investigation of topics not covered in regularly scheduled courses.

RDNG 403. Literature for Children. 3 Hours.
A survey of children's literature, with attention to historical development as well as current trends. Emphasizes selection, critical evaluation, and utilization of literary materials for developmental, recreational, and curriculum needs. Appropriate media included.

RDNG 421. Developmental Reading. 3 Hours.
PR: Consent. Fundamentals of reading instruction. Emphasizes classroom organization and teaching techniques.

RDNG 422. Reading in the Content Areas. 3 Hours.
Skills and strategies needed by content area teachers to reinforce the reading skills necessary for the effective learning of secondary students in the content areas.

RDNG 423. Literacy and the Young Child. 3 Hours.
This course studies essential emergent literacy skills in young children and examines ways that these skills are developed in primary grade classrooms and at home.

RDNG 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

RDNG 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

RDNG 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

REHB 494. Seminar. 1-3 Hours.
REHB 494. Seminar. 1-3 Hr PT: Consent. Presentation and. discussion of topics of mutual concern to students and faculty.

RELG 102. Introduction to World Religions. 3 Hours.
This course explores five of the most widely practiced world religions; Judaism, Christianity, Islam, Hinduism, and Buddhism. Students are introduced to the history and basic tenets of each faith.

RELG 120. Introduction to the Study of Religion. 3 Hours.
Religious Studies as a field is interdisciplinary in its approaches. Drawing on sociology, anthropology, psychology, theology, and other perspectives, students will explore key themes, major ideas, and important figures in the study of religion. We will examine what it means to "study religion," and explore what different perspectives might contribute to the field.

RELG 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

RELG 219. The History of Christianity. 3 Hours.
This course explores the birth and evolution of Christianity from its inception until the modern era. Emphasis will be placed upon the significant people and events that shaped Christianity.

RELG 222. Origins of Judaism. 3 Hours.
Main beliefs and practices of the Jewish religion in its formative period, 500 B.C. to 500 A.D. Selections from the late Old Testament writings, the Apocrypha and Pseudepigrapha, the Dead Sea Scrolls, and rabbinical literature.

RELG 223. Christianity in America. 3 Hours.
Explore the history of American Christianity, as republican ideology, democratic polity, and commitment to individual freedom create a competitive religious marketplace without an established church.

RELG 230. Religions of India. 3 Hours.
Proto-Indian religion, Hinduism, beginnings of Buddhism, Jainism, Sikhism; historical and theological foundations; developments of thought; and contemporary expressions and encounters with the modern world.

RELG 231. Religions of China and Japan. 3 Hours.
Buddhism, Confucianism, Taoism, Shintoism; historical and theological foundations; developments of thought; and contemporary expressions and encounters with the modern world.

RELG 232. History and Practice of Islam. 3 Hours.
Examines the origins and development of Islam from its inception in ancient Arabia to the modern era. The central beliefs, practices, and denominations associated with Islam will also be explored.

RELG 255. Religion Across Cultures. 3 Hours.
Introduces cross- cultural study of religion, with emphasis on non-western examples; surveys classic statements by major modern theorists, focusing on comparison in modern and secular academic setting.

RELG 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

RELG 301. Studies in Asian Scriptures. 3 Hours.
Explores the content and background of Hindu, Buddhist, and Confucian scriptures from the Vedic period through the modern era. Examines the historical, cultural, and religious settings of the texts as well as their theological concepts.

RELG 303. Studies in Christian Scripture. 3 Hours.
This course explores the origin and development of the Christian Bible. The historical, cultural, and religious settings of the texts, as well as their theological intent, will be examined.

RELG 304. Studies in Hebrew Scriptures. 3 Hours.
This course explores the origin and development of the Hebrew Bible. The historical, cultural, and religious settings of the texts, as well as their theological intent, will be examined.

RELG 305. Biblical History/Archaeology. 3 Hours.
Explores development of the biblical world from 2,000 BCE through the first century CE. Various cultures will be examined socially, historically, and religiously. How biblical archaeology impacts understanding of the Bible will also be discussed.

RELG 306. Biblical History and Archeology of Israel. 1-6 Hours.
Study abroad program in Israel. Students explore the biblical world from the Iron Age to the Roman era through participation in an archaeological dig. Examines social, historical, and religious dimensions of various ancient cultures.

RELG 310. Historical Theology. 3 Hours.
Explore the historical development of Judeo-Christian theology from ca. 1000 BCE through the mid-20th century. Topics will include the nature of God, Christology, and apocalypticism.

RELG 330. Religion and Music. 3 Hours.
Exploration of religion through music -- a source of spiritual elation, social cohesion, and empowerment in cultures around the world. Musical sound is sacred in most religions because it embodies the divine and can be shared by all participants. Application of ideas, theories, and methods to the diverse contours and contexts of post-1960s popular music.

RELG 335. Religion and Science. 3 Hours.
Introduction to, and survey of, the professional, popular, and academic relationships between religion and science, based on the issues raised by following questions: Where did we come from? Where are we going? In the beginning, why did the 'Big Bang' occur? Do quantum physics challenge our assumptions about reality? Is evolution God's way of creating?.

RELG 350. Biblical Ethics/Current Issues. 3 Hours.
Introduction to biblical ethics and its application to current issues. Issues such as war, the environment, and biotechnology are explored by interpreting biblical texts as a touchstone of ethical principles and values.

RELG 364. Gods and Monsters. 3 Hours.
Throughout religious history, the ideas of the sacred or divine have often been paired with questions of evil and terror. Examination of the ways good and evil - or "gods and monsters" - have been considered, addressed, and adapted to specific cultural contexts.

RELG 365. Theories of Magic and Religion. 3 Hours.
Exploration of ancient, pre-modern, and postmodern ideas of the relationship between magic and religion. Magic and religion are terms which are often understood in relation to each other; however, our own understanding of what these words mean impacts our understanding of how they relate to each other.

RELG 366. Evolution of Evil & The Devil. 3 Hours.
Explores the history of Evil and the Devil from the biblical era to the 20th century. Primarily explores Evil and the Devil from a Judeo-Christian perspective, but other world traditions' views are examined as well, including Islam, Hinduism, and Buddhism. Historical accounts, relevant contemporary texts, and media portrayals are some of the methodologies utilized.

RELG 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

RELG 410. Apocalypse. 3 Hours.
PR: ENGL 102 or ENGL 103. Examine the apocalyptic literature of Judaism and Christianity and consider its perspectives and functions by tracing the impact of leading theologies and interpretations of end-time prophecy.

RELG 482. Interactions in World Religions. 3 Hours.
PR: 12 credits of RELG course work or consent. Explores the in-depth history and interactions among major world religions and cultures from ancient times through the modern era. Emphasis upon specific geographical regions including the Middle East, Asia Minor, and the Far East.

RELG 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

RELG 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

RELG 492. Directed Study. 1-3 Hours.
Directed study, reading, and or research.

RELG 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

RELG 494. Seminar. 1-3 Hours.
PR:Consent. Presentation and discussion of topics of mutual concern to students and faculty.

RELG 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

RELG 496. Senior Thesis. 1-3 Hours.
PR: Consent.

RELG 497. Research. 1-6 Hours.
Independent research projects.

RELG 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

RESM 140. Sustainable Living. 3 Hours.
Explores the personal, social, economic and environmental aspects of making sustainable choices. Sustainability principles and practices are discussed along with assessments of consumption and lifestyle decisions. Also listed as DSGN 140 and PLSC 140.

RESM 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

RESM 390. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

RESM 405L. Drones in Resource Management. 3 Hours.
PR: An interest in aeronautical principals, spatial data collection and analysis, and natural resource applications is preferred. Provides training in the use of drones to collect and analyze spatial data in natural resource applications.

RESM 440. Foundations of Applied Geographic Information Systems. 3 Hours.
PR: Corequisite of RESM 440L. An introductory course designed to provide the necessary background and techniques to use GIS technology to analyze and solve spatial problems. An emphasis is placed on acquisition, management, and manipulation of spatial data.

RESM 440L. Foundations of Applied Geographic Information Systems Laboratory. 0 Hours.
Coreq: RESM 440. Foundations of Applied Geographic Information Systems - RESM 440 Laboratory.

RESM 443. Intro GIS for Trail Planners. 2 Hours.
Introduce technical skills to support site analysis and mapping geographic constraints for trail planning, focusing on technological tools available to new GIS users. The goal of this course is to introduce Geographic Information Systems (GIS) and build foundations in its use to allow students to solve spatial problems. Specifically, the course will teach students necessary spatial and quantitative analysis methods.

RESM 444. Advanced GIS for Natural Resource Management. 3 Hours.
PR or CONC: RESM 440 with a minimum grade of C- or consent. Provides advanced training using geographic information systems to address the spatial issues of managing natural resources.

RESM 445. Spatial Hydrology and Watershed Analysis. 3 Hours.
PR: RESM 440 or consent. Introduction to applied spatial hydrology using GIS; integrates statistical modeling and terrain analysis; provides insights into water quality and quantity analysis for local and regional watershed scales. (Credit cannot be received for both RESM 445 and RESM 545.).

RESM 450. Land Use Planning Law. 3 Hours.
Focus is on identification and understanding of legal issues related to planning and land use. This involves understanding rights, regulations, and responsibilities associated with land use, planning, and related activities.

RESM 455. Practice of Land Use Planning. 3 Hours.
Examines comprehensive land use planning including planning's origin and evolution plus the processes used to create and implement a plan. Focus is on land use and how it relates to other issues.

RESM 460. Energy Project and Program Management. 3 Hours.
PR: Junior or Senior Standing. The concepts and best practices of modern project management as applied to manage activities that meet the requirements of energy and environmental resource industry related programs and projects.

RESM 475. Solar PV Technology & Policy Fundamentals. 3 Hours.
This course will provide the student with an overview of solar PV technology. The student will also be introduced to key energy policies and economic influences on today’s solar market.

RESM 480. Environmental Regulation. 3 Hours.
Course focusing on laws and policies applicable to the environment. Students will learn to read and interpret statutes, regulations and cases that impact water, air, toxic substances, land and endangered species.

RESM 491. Professional Field Experience. 1-18 Hours.
PR: Consent (may be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

RESM 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

RESM 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

RESM 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

RESM 496. Senior Thesis. 1-3 Hours.
PR: Consent.

RESM 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ROBE 271S. Robotic Engineering Design 1. 1 Hour.
PR: MAE 202. Hands-on applications of concepts learned in other courses to meet specified performance or competition criteria of capstone design courses. Introductory concepts of an integrated sophomore-junior-senior design team.

ROBE 313. Fundamentals of Robotic Systems. 3 Hours.
PR: MATH 251 with a minimum grade of C- and MAE 211 and MAE 211L and ((CS 110 and CS 110L) or MAE 216L). Introduction to robotics; impact of robotics in the society; configuration space and robot representation; robot programing and simulation; and introduction to computer vision.

ROBE 371S. Robotic Engineering Design 2. 2 Hours.
PR: ROBE 271S with a minimum grade of C-. Continued applications of concepts learned in other courses to meet specified performance or competition criteria of capstone design courses. Intermediate concepts of an integrated sophomore-junior-senior design team.

ROBE 412. Mobile Robotics. 3 Hours.
PR: (CPE 271 and CPE 271L) or ROBE 313. Fundamental topics in Mobile robotics; methods of locomotion; common mobile robot sensors, state estimation and navigation algorithms; path planning and obstacle avoidance methods; robot decision making and control processes; and mobile robot systems design.

ROBE 413. Robotic Manipulators. 3 Hours.
PR: ROBE 313. Fundamentals of robotic manipulators including forward and inverse kinematics, mechanics, modeling, and control; introduction to robot motion planning and industrial manipulator programing; applications of robotic manipulators.

ROBE 414. Robot Autonomy. 3 Hours.
PR: ROBE 313. Autonomous robot stacks; robot motion planning; decision making; artificial intelligence in robotics.

ROBE 471S. Principles of Engineering Design. 3 Hours.
PR: ROBE 313 and MAE 342 and PR or CONC: EE 251. Design solutions for challenging robotics engineering problems through rational analysis and creative synthesis. Planning, designing, and reporting on complex systems on individual and group basis.

ROBE 472S. Engineering Systems Design. 3 Hours.
PR: MAE 342 and ROBE 313 and PR or CONC: EE 251. Implementation of solutions for challenging robotics engineering problems through rational analysis and creative synthesis. Planning, designing, and reporting on complex systems on individual and group basis.

ROBE 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

ROBE 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.

ROBE 496. Senior Thesis. 1-3 Hours.
PR: Consent.

ROBE 497. Research. 1-6 Hours.
Independent research projects.

RPTR 140. Adventure West Virginia. 3 Hours.
This course provides incoming WVU freshmen with the information and tools helpful for a successful transition from high school to college through a field-based, experiential curriculum and classroom sessions. Significant attention is given to critical thought and reflection on oneself, relationships, and place in society.

RPTR 140A. Adventure West Virginia. 3 Hours.
This course provides incoming WVU freshman with the information and tools helpful for a successful transition from high school to college through a field-based, experiential curriculum.

RPTR 142. Introduction to Recreation, Parks and Tourism. 3 Hours.
This course explores the meanings and roles of leisure and recreation in society and in your life. Topics include an overview of the field of recreation, leisure, and tourism: foundational concepts and philosophy, history, impacts, management, and current issues. This course also covers career planning and professional development opportunities.

RPTR 145. Recreation Services for Special Populations. 3 Hours.
PR: Consent. Introductory analysis of current therapeutic recreation and park services to include members of special populations; familiarization with planning for the conduct of such services.

RPTR 148. Wilderness First Responder. 3 Hours.
PR: Consent. This course provides training necessary to become certified in dealing with various aspects and levels of outdoor/ wilderness crises for forestry, recreation, or any outdoor professionals. (Grading will be pass/fail.).

RPTR 150. Backcountry Living Skills. 1,3 Hour.
PR: Consent. The purpose of this course is to develop and refine the skills necessary to camp and travel in the outdoors.

RPTR 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

RPTR 225S. Foundations of Facilitation. 1 Hour.
This course examines the foundations to effective group facilitation and provides practical experience putting facilitation techniques to use with ground-based initiatives and low challenge course elements.

RPTR 242. Environmental and Cultural Interpretation. 3 Hours.
This course is about people, communication and natural resource management. It focuses on theory and application of communication methods for natural resource settings and topics, including communication of technical information to lay publics.

RPTR 249. GIS in Recreation and Tourism. 3 Hours.
PR: Corequisite of RPTR 249L. Covers GIS applications in the temporal and spatial complexities of recreation and tourism.

RPTR 249L. GIS in Recreation and Tourism Laboratory. 0 Hours.
Coreq: RPTR 249. GIS in Recreation and Tourism - RPTR 249 Laboratory.

RPTR 251. Leadership in Experiential Education. 3 Hours.
This course focuses on elements of leadership in outdoor and experimental education and provides students with hands-on learning opportunities.

RPTR 255. Adventure Abroad: Wilderness Leadership in an International Context. 6 Hours.
This course will provide a theoretical and applied study of wilderness leadership in an international context. Participants will study relevant leadership theory, critical wilderness skills, and international programming concepts. The program will culminate in a student-led “final” in which the instructors’ step back to observe the students put their new knowledge and skills to the test.

RPTR 263. Program Planning in Recreation, Parks and Tourism. 3 Hours.
PR: RPTR major or consent. Fundamentals of general program planning, needs, facilities, age groups, local customs, climatic factor, etc.; settings such as parks, playgrounds, indoor centers, playing fields, hospitals, voluntary agencies, industrial settings, and campuses.

RPTR 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

RPTR 325. Challenge Course Facilitation. 3 Hours.
This course involves learning the background philosophies, theories, and structures that have led to development of the challenge course industry. Students will also learn the basic skill necessary to safely facilitate a group.

RPTR 326S. Canopy Tour Facilitation. 3 Hours.
Exposes the student to the skills and knowledge necessary to act as a canopy tour guide including: risk management, operations, technique, facilitation, and an overview of the industry. Successful completion of the course will qualify the student to take the Association for Challenge Course Technology (ACCT) Level 1 Practitioner Certification Exam.

RPTR 335. Management in Recreation, Parks and Tourism Organizations. 3 Hours.
PR: 12 hours of RPTR courses, junior standing, or consent. Principles of administration as applied to the operation of recreation, parks and tourism organizations, including policy, legal foundations, organization, personnel, and finance.

RPTR 339. Sustainable Tourism Management. 3 Hours.
This course will introduce students to the phenomenon and significance of global tourism and teach them how to apply tourism principles to support community economic development.

RPTR 351. Sustainable Tourism. 3 Hours.
PR or CONC: RPTR 352. The purpose of this course is to provide students of all majors with an understanding of both theory and practical applications of concepts surrounding sustainable tourism development in the South Pacific.

RPTR 352. Marine Ecotourism. 3 Hours.
PR or CONC: RPTR 351. This course will focus on developing interpretation and information strategies in tourism to protect and conserve marine ecosystems.

RPTR 353. Sustainable Tourism in Patagonia. 3 Hours.
PR: RPTR 150; Winter Break excursion in Patagonia, Chile. This course will provide a theoretical and applied study of sustainable tourism and the ecosystems and culture of the Aysen region of Patagonian Chile. Alongside local guides and entrepreneurs, students will explore nature-based tourism and investigate how this tourism can be an agent of sustainable development. Student will investigate contemporary controversial issues in Chilean Patagonia.

RPTR 365. Planning and Design in Recreation, Parks and Tourism. 3 Hours.
PR: RPTR major or consent. Study of planning and design concepts, standards and guidelines, use continuum, grants-in-aid, and planning of selected areas and facilities: parks, pools, centers and recreation areas.

RPTR 380. Expedition Planning and Education in the Outdoors. 3 Hours.
PR: RPTR 251 with a minimum grade of C- or consent. This course is intended to examine and practice principles of expedition planning and education in outdoor and experiential settings. The course will focus on conceptualization, design, and implementation of two backcountry experiences, and students will practice curriculum development and educational strategies through guided lesson planning and facilitation.

RPTR 433. Recreation Resource Management. 3 Hours.
An analysis of land management agencies and major legislation concerned with recreation resource management; review, develop, and apply recreation resource and visitor use management plans.

RPTR 434. Wilderness in American Society. 3 Hours.
PR: RPTR 433 or consent. A seminar examining political, sociological, and environmental aspects of American wilderness. A discussion on articles concerning wilderness preservation, management, and aesthetics.

RPTR 436. Sustainable Trails: Engagement. 3 Hours.
Develop management plans, incorporate interpretive signage, and activate greenspace and public trails with civic engagement while planning for post-construction maintenance. Cross listed with RPTR 536 (for graduate students).

RPTR 442. Advanced Interpretive Techniques. 3 Hours.
PR: RPTR 242 or consent and junior standing. This is an advanced course on the development of interpretive programs that reflect the historical, cultural, and natural resources of an area. The course employs a project-based approach. Students will develop and critique both personal and non-personal products.

RPTR 448. Ecotourism Development. 3 Hours.
Covers applied approaches to the development and operation of nature-based tourism businesses. Sustainable tourism principles, business planning, marketing strategies, and management issues are thoroughly examined.

RPTR 450. Social Research Methods in Natural Resource Management. 3 Hours.
Social research methods in natural resource management with concentration on problem identification and solving. Data collection methods and applications specific to natural resource management social settings will be studied.

RPTR 472. Tourism System and Destination Management. 3 Hours.
Analysis of the demand and supply components of the tourism system and identification of destination management approaches to manage this tourism system in-order to build and maintain a competitive and sustainable destination.

RPTR 485. Professional Development Seminar. 1 Hour.
This course is a capstone preplanning course for the professional internship program. The course emphasizes professional development and career planning.

RPTR 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

RPTR 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

RPTR 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

RPTR 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

RPTR 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

RPTR 496. Senior Thesis. 1-3 Hours.
PR: Consent.

RPTR 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

RT 301. An Introduction to Respiratory Therapy. 4 Hours.
This course introduces the science of respiratory therapy medicine. Topics to be explored include the history of respiratory medicine, what is respiratory therapy, acute, non-acute, and atypical areas of RT practice, obtaining a patient history, performing inspection and clinical assessment techniques, medical ethic theories, outpatient diagnostics, vaping/smokeless cessation strategies, RT therapeutics, and maximizing skills to achieve optimal patient outcomes.

RT 310. Respiratory Therapy Equipment, Procedures, and Processes. 3 Hours.
PR: Admission into the Professional Phase of the Respiratory Therapy Program. This course will introduce students to all aspects, types, and forms of equipment utilized within respiratory therapy. A concentration of the assembly, operation, application, principles, theories, processes, and procedures of respiratory therapy equipment will be comprehensively explored.

RT 311. Respiratory Therapy Equipment, Procedures, and Processes Lab. 1 Hour.
PR: Admission into the Professional Phase of the Respiratory Therapy Program. This course will provide valuable hands-on instruction and require students to master the set-up, initiation, operation, maintenance, modification, management, and discontinuation of respiratory therapy equipment, procedures, and processes utilized within the profession of respiratory therapy. Numerous topics will be explored including medical gases, therapeutics, patient monitoring and assessment, artificial airways, intubation/extubation, non-invasive positive pressure ventilation, high flow oxygen and others.

RT 320. Respiratory Therapy Cardiopulmonary Anatomy and Physiology. 3 Hours.
PR: Admission into the Professional Phase of the Respiratory Therapy Program. This course provides students a comprehensive overview of the anatomy and physiology of the cardiopulmonary system. Numerous topics will be explored including the respiratory system, ventilation dynamics, pulmonary function assessment/techniques, diffusion, gas laws, circulatory system, oxygen transport, acid base balance, ventilation perfusion relationships, and neurological control of ventilation. Respiratory therapy case study applications will be integrated into the course.

RT 340. Pharmacology Fundamentals in Respiratory Therapy. 3 Hours.
PR: Admission into the Professional Phase of the Respiratory Therapy Program. This course will explore the dynamic principles, theories, categories, applications, and actions of respiratory therapy pharmacology. Students will examine the phases of drug action including pharmacokinetics, pharmacodynamics, and pharmacogenetics. The dosage, delivery, methods of action, indications, contraindications, modifications, and hazards of respiratory therapy and critical care medications will be discussed.

RT 350. PFTs, Sleep, and RT Alternative Settings. 3 Hours.
PR: Admission into the Professional Phase of the Respiratory Therapy Program. This course will explore alternative settings and procedures of respiratory therapy practice. Students will be introduced to the areas of pulmonary function testing, polysomnography (sleep medicine), home care, pulmonary rehabilitation, hyperbaric oxygenation, bronchoscopies and additional alternative procedures and settings utilized within respiratory therapy.

RT 360. Patient Assessment and Therapeutic Procedures in Respiratory Therapy. 3 Hours.
PR: RT 301 and RT 310 and RT 311 and RT 320 and RT 340 and RT 350 and RT 378 with a minimum grade of C in each. This course examines the vital topics of effective patient assessment and common therapeutic procedures and interventions utilized within respiratory therapy. The course explores evaluating data obtained from the inspection, palpation, percussion, and auscultation of patients, interviewing, and educating the patient and family, analyzing patient information, and modifying treatment plans, medical gas therapy, and various respiratory therapeutics processes and procedures.

RT 370. Neonatal and Pediatric Diseases and Therapeutics in Respiratory Therapy. 3 Hours.
PR: RT 301 and RT 310 and RT 311 and RT 320 and RT 340 and RT 350 and RT 378 with a minimum grade of C in each. This course provides an intriguing and comprehensive exploration of diseases, concepts, theories, procedures, and therapeutics found in neonatal and pediatric respiratory therapy. Students will extensively critique and analyze neonatal and pediatric anatomical, pathophysiological, and disease processes. The course examines gestational development, fetal gas exchange/circulation, fetal assessment, difficult neonatal deliveries, prematurity, neonatal/pediatric resuscitation, congenital malformations, and neonatal and pediatric therapeutics.

RT 371. Neonatal and Pediatric Laboratory Exercises and Interventions in Respiratory Therapy. 1 Hour.
PR: RT 301 and RT 310 and RT 311 and RT 320 and RT 340 and RT 350 and RT 378 with a minimum grade of C in each. This course will provide students hands-on activities to explore, assemble, initiate, operate, investigate, modify, and demonstrate competencies with common procedures encountered in neonatal and pediatric respiratory therapy. Students will also develop mastery of a detailed and comprehensive methodology to analyze, evaluate, and demonstrate timely and accurate neonatal and pediatric resuscitation interventions.

RT 378. Respiratory Therapy Clinical Practicum 1 (An Introduction to Clinical Practice). 1 Hour.
PR: Admission into the Professional Phase of the Respiratory Therapy Program. This clinical practicum course introduces the student to the clinical environment and targets basic patient respiratory interventions, care, and therapeutics. Students will complete CPR certification at the onset of the course and prior to entering the general patient care clinical environment at an approved off-campus clinical facility.

RT 380. Mechanical Ventilation Foundations. 3 Hours.
PR: RT 301 and RT 310 and RT 311 and RT 320 and RT 340 and RT 350 and RT 378 with a minimum grade of C in each. This course provides an extensive overview of basic mechanical ventilation concepts and theories encountered within respiratory therapy. Numerous philosophies are explored including the indications, contraindications, initial and modification of settings, set-up process, alarm parameters, discontinuation, complications, pneumatic principles, non-invasive positive pressure ventilation, and pathophysiological effects of the mechanically controlled patient. Basic strategies to maximize mechanically ventilated patient outcomes are explored.

RT 381. Mechanical Ventilation Laboratory Exercises and Applications in Respiratory Therapy. 1 Hour.
PR: RT 301 and RT 310 and RT 311 and RT 320 and RT 340 and RT 350 and RT 378 with a minimum grade of C in each. This course will provide students hands-on activities to explore, assemble, initiate, operate, investigate, modify and demonstrate competencies with mechanical ventilation procedures encountered in respiratory therapy. Adult, neonatal, high frequency, non-invasive and atypical ventilatory activities and monitoring will be explored in detail.

RT 388. Respiratory Therapy Clinical Practicum 2. 4 Hours.
PR: RT 301 and RT 310 and RT 311 and RT 320 and RT 340 and RT 350 and RT 378 with a minimum grade of C in each. This clinical practicum course integrates hands on respiratory therapy patient management, diagnostic procedures, therapeutics, education of patients and family, and complete respiratory therapy in basic and high-risk scenarios and activities. This course expands student exposure in the general patient care setting and introduces various specialty areas of respiratory therapy practice including home care, sleep medicine, outpatient diagnostics, and others.

RT 389. Cardiopulmonary Disease Pathophysiology. 3 Hours.
PR: RT 301 and RT 310 and RT 311 and RT 320 and RT 340 and RT 350 and RT 378 with a minimum grade of C in each. This course explores the etiology, pathology, pathogenesis, pathophysiology, clinical manifestations, monitoring, diagnosis, and treatment of cardiopulmonary related diseases/disorders. This course examines asthma, chronic bronchitis, respiratory failure, emphysema, ARDS, CHF, lung cancer, neuromuscular disorders, sleep apnea, cystic fibrosis, pulmonary hypertension, post-surgical patients, pneumonia, atelectasis, drug/alcohol overdoses, pulmonary embolism, neurologic, trauma, infectious diseases, shock, sepsis, burn/inhalation injury, bariatrics, and traumatic brain injury.

RT 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

RT 400. Hemodynamic and Intensive Care Principles and Practices. 3 Hours.
PR: RT 360 and RT 370 and RT 371 and RT 380 and RT 381 and RT 388 and RT 389 with a minimum grade of C in each. This course provides a comprehensive examination into concepts, theories, and procedures utilized by the respiratory therapist to optimally manage the critically ill patient. Topics covered include hemodynamic applications/philosophies, invasive lines/drains, neurological considerations, difficult airways, patient assessment, chest tubes, fluid balance, skin integrity, high flow oxygen delivery, EKG's, apnea testing and monitoring, BP assessment, heart rhythm/sounds, bronchoscopies, and emergency interventions.

RT 401. Senior Respiratory Therapy Capstone. 2 Hours.
PR: RT 400 and RT 420 and RT 436 and RT 478 and RT 497 with a minimum grade of C in each. This course focuses on displaying mastery of knowledge, skills, and professionalism acquired by the senior respiratory therapy student. Students will complete three senior style projects which include oral, written, and portfolio development skills. Students will complete a senior research project, portfolio compilation, and extensive project creating a blueprint to prepare for the National Board for Respiratory Care credentialing exams.

RT 420. Advanced Application and Theories in Mechanical Ventilation. 3 Hours.
PR: RT 360 and RT 370 and RT 371 and RT 380 and RT 381 and RT 388 and RT 389 with a minimum grade of C in each. The application of mechanical ventilation concepts, theories and principles is among the most important responsibilities for respiratory therapists to master for their patients. This course will present an immersive experience which serves to prepare, examine, and synthesize advanced analytical theories and applications of mechanical ventilation. This course presents innovative interventions and strategies to maximize patient outcomes receiving mechanical ventilation support.

RT 430. Interdisciplinary Science, Leadership, Management, and Education in Respiratory Therapy. 3 Hours.
PR: RT 400 and RT 420 and RT 436 and RT 478 and RT 497 with a minimum grade of C in each. This course examines theories and concepts promoting the advancement and optimization of the respiratory therapy professional. Areas to be covered include interdisciplinary science, leadership roles, management strategies, respiratory education and evidence-based practice.

RT 436. Comprehensive Board Preparation and Review 1. 3 Hours.
PR: RT 360 and RT 370 and RT 371 and RT 380 and RT 381 and RT 388 and RT 389 with a minimum grade of C in each. This course is the first in a two-part series which targets preparation of students for successful mastery on the National Board for Respiratory Care TMC, CSE, and Specialty credentialization examinations. Topics reviewed include medical gases, humidity/aerosols, assessment of the cardiopulmonary patient, airway management, hyperinflation therapeutics, bronchial hygiene, ABG's, pharmacology, home care, RT equipment, infection control, formulas/calculations, and disease pathology.

RT 460. Interpretation and Assessment of Labs, Tests, and Diagnostic imagery. 3 Hours.
PR: RT 400 and RT 420 and RT 436 and RT 478 and RT 497 with a minimum grade of C in each. The assessment of patients can be greatly augmented by data obtained from medical procedures. This course provides an in-depth view of the vast area of medical laboratory values, testing processes, and diagnostic imagery assessment procedures utilized in respiratory therapy. The identification of normal/abnormal results will be explored and how this information can support a differential diagnosis and optimal patient management.

RT 466. Comprehensive Board Preparation and Review 2. 3 Hours.
PR: RT 400 and RT 420 and RT 436 and RT 478 and RT 497 with a minimum grade of C in each. This course is the second in a two-part series which targets preparation of students for successful mastery on the National Board for Respiratory Care TMC, CSE, and Specialty credentialization examinations. Topics reviewed include test taking methodologies/strategies, special respiratory care procedures, emergency respiratory interventions/procedures, cardiac and hemodynamic monitoring, neonatal/pediatrics, pulmonary function testing, respiratory ethical considerations, formulas/calculations and ventilator management.

RT 478. Respiratory Therapy Advanced Clinical Practicum 3. 6 Hours.
PR: RT 360 and RT 370 and RT 371 and RT 380 and RT 381 and RT 388 and RT 389 with a minimum grade of C in each. This clinical practicum course will initiate student exposure to the vital critical care arenas of respiratory therapy practice. A targeted focus will explore the management of the adult mechanically ventilated patient. This course will optimize student critical thinking and problem solving in the adult critical care environment. This course provides students with advanced clinical experience at approved off-campus clinical facilities.

RT 488. Respiratory Therapy Advanced Clinical Practicum 4. 6 Hours.
PR: RT 400 and RT 420 and RT 436 and RT 478 and RT 497 with a minimum grade of C in each. This clinical practicum course continues building critical care knowledge, skills, and experience and expands exposure into the neonatal/pediatric intensive care forum. Student will master critical thinking and problem solving and will expand their versatility of training by participating, managing, and optimizing neonatal and high-risk emergency scenarios. Students will complete advanced clinical experience at approved off-campus clinical facilities.

RT 497. Research. 1-6 Hours.
Independent research projects.

RUSS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

RUSS 301. Conversation and Composition 1. 3 Hours.
PR: RUSS 204. Emphasis on development of written and oral communicative skills of contemporary Russian.

RUSS 302. Conversation and Composition 2. 3 Hours.
PR: RUSS 301. Continuation of RUSS 301. Emphasis on development of written and oral communicative skills of contemporary Russian.

RUSS 303. Advanced Structure and Reading 1. 3 Hours.
PR: RUSS 204. Development of communicative skills, with emphasis on reading authentic texts and review of Russian language.

RUSS 304. Advanced Structure and Reading 2. 3 Hours.
PR: RUSS 303. Continuation of RUSS 303. Development of communicative skills, with emphasis on reading authentic texts and review of Russian language structures.

RUSS 331. The Russian Short Story. 3 Hours.
PR: RUSS 204. Reading, discussing, and writing in Russian about short stories of selected nineteenth-century Russian writers.

RUSS 332. The Russian Short Story. 3 Hours.
PR: RUSS 204. Reading, discussing, and writing in Russian about short stories of selected contemporary Russian writers.

RUSS 341. Survey of Russian Literature. 3 Hours.
PR: RUSS 204. Major works of selected Russian authors from the beginning through the nineteenth century, including those of Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky, and Tolstoy.

RUSS 342. Survey of Russian Literature. 3 Hours.
PR: RUSS 204. Major works of selected Russian authors from the beginning of the twentieth century to the present.

RUSS 351. Russian Through Music. 3 Hours.
PR: RUSS 204 or consent. Conducted in Russian. Course acquaints students with the diverse music styles and genres in Russian culture, and develops Russian language proficiency through exposure to authentic textual and audio-visual materials of Russian classical and contemporary songs and music pieces, as well as discussions.

RUSS 352. Russian in Action. 3 Hours.
PR: RUSS 204 or consent. Conducted in Russian. Course helps students improve fluency and authentic flair of speech by providing intensive practice in contemporary standard Russian pronunciation, stress, and intonation. Course helps students improve pronunciation and aural sensitivity to Russian speech.

RUSS 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

RUSS 450. Modern Russian Society. 3 Hours.
PR: RUSS 204 or consent. Conducted in Russian. For students in the fourth year of Russian or higher. Course improves students' reading, speaking, listening, and grammatical skills, with a particular emphasis on post-Soviet language and culture. Topics focus on idiomatic language use and contemporary society.

RUSS 451. Russian Culture. 3 Hours.
PR: RUSS 204. A study of Russian civilization, customs, and ethos.

RUSS 452. Business and Political Russian. 3 Hours.
PR: RUSS 204 or consent and recommended for students in third- or fourth-year Russian or higher. Conducted in Russian. Course advances competencies in formal communication and introduces basic concepts and topics from the business and political realms in contemporary Russian society, the Russian-speaking world, and the global workplace.

RUSS 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

RUSS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 Hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

RUSS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

RUSS 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

RUSS 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

RUSS 496. Senior Thesis. 1-3 Hours.
PR: Consent.

RUSS 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

SAFM 401. Safety Management Integration. 3 Hours.
Consideration of integrated arrangements, staff roles, management theory, staff liaison, project improvement, effectiveness, audits, and collaboration needed to assure success of the safety function. This course is an orientation to the basic concepts of safety management including the philosophical foundations of safety management, safety cultures, roles in safety management, performance drivers and measurement, quality and safety, OSHA, and safety policy.

SAFM 411. General Industry Safety. 3 Hours.
PR: Junior standing or higher. Focuses on management and planning aspects of general industry safety, including walking working surfaces, confined space, machine guarding, electricity, fire protection, emergency planning, and other compliance aspects of 29 CFR 1910.

SAFM 470. Managing Construction Safety. 3 Hours.
Focuses on management and planning aspects of construction safety, including fall protection, scaffolding, excavation, hand and power tools, cutting and welding, others. Compliance aspects of 29CFR 1926 (with various subparts) concerned with building and highway construction.

SAFM 471. Motor Fleet Safety. 3 Hours.
Safety elements of automotive transportation including design, operation, planning, control, and effects of legislation.

SAFM 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SBEN 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

SBEN 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.

SCFD 100. Education in the American Culture. 3 Hours.

SCFD 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SCFD 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

SCFD 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

SCFD 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SCFD 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

SCFD 496. Senior Thesis. 1-3 Hours.
PR: Consent.

SEES 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

SEES 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

SEES 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.

SEES 497A. Research: Capstone. 1-6 Hours.
Independent research projects.

SEP 272. Introduction to Sport and Performance Psychology. 3 Hours.
Students are introduced to the roles, training, and ethical standards of sport and performance psychology, establish a foundation of knowledge on the psychological factors that influence performance in sport and other contexts, and assess strengths and challenges of mental performance and mental skills training.

SEP 283. Introduction to Exercise Psychology. 3 Hours.
Students are introduced to the field of exercise psychology and its role in health promotion and disease prevention, establish a foundation of knowledge on the psychological determinants and consequences of exercise behavior, and apply process skills to their own exercise behavior change project.

SEP 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SEP 298. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

SEP 350. Leadership Theory and Application in Sport. 3 Hours.
Theories and principles of leadership and their practical application to the development and advancement of sport organizations.

SEP 371. Sport in American Society. 3 Hours.
Students will explore, critically analyze, and develop strategies for addressing, major social issues affecting sport in American society.

SEP 373. African Americans in Sports. 3 Hours.
Sociocultural and historical overview of the contributions of African Americans in sport in America.

SEP 385. Performance Psychology of Teams and Groups. 3 Hours.
Students will explore social psychological theory and research to understand team and group performance in sport and other performance contexts. Students will apply course content to practical situations important to students' professional and personal lives.

SEP 415. Physical Activity Promotion in Diverse Settings. 3 Hours.
Students explore the health effects of physical activity and exercise, inequities in access to physical activity settings, and health disparities. This course prepares students to promote, initiate, and evaluate physical activity programs in diverse settings.

SEP 420. Sport and Performance Enhancement. 3 Hours.
PR: SEP 272 with a minimum grade of C- and Junior or Senior standing. Students engage with key concepts, ethical issues, and scholarly work in the field of applied sport psychology with opportunity to learn and practice performance enhancement techniques applicable to sport and other performance contexts.

SEP 425. Psychology of Injury and Rehabilitation. 3 Hours.
This upper-level course involves the study of psychological factors associated with the onset, treatment, and rehabilitation of injury, particularly injury sustained in sport and other performance contexts.

SEP 430. Cross Cultural Perspectives in Sport Psychology. 3 Hours.
Faculty led study abroad course associated with travel to a foreign country at student’s expense. Students on the trip are exposed to foreign culture, landmarks, and sport facilities while meeting and interacting with sport-science professionals. The course prepares students for the travel experience and allows them to reflect upon it after returning.

SEP 474. Sport Studies Research Methods. 3 Hours.
PR: (MATH 124 or STAT 111 or STAT 211 or EDUC 232) with a minimum grade of C-, Senior standing, and instructor approval only. Students explore primary research designs, methodological approaches, and research ethics in sport, exercise, and performance psychology and become acquainted with the research process through a capstone research project.

SEP 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

SEP 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

SEP 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

SEP 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SEP 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

SEP 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

SEP 496. Senior Thesis. 1-3 Hours.
PR: Consent.

SEP 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

SHED 250. Foundations of School Health. 3 Hours.
The goals for this course include introducing students to the field of school health education and promotion and developing the theoretical background, philosophical approach, and professional skills required to effectively serve as a school-based public health professional. Further, this course emphasizes child and adolescent health promotion and advocating for student health and wellbeing in school and community settings.

SHED 300. Health Education for Elementary School Teachers. 2 Hours.
Designed specifically for future elementary school teachers, this course provides an overview of the elementary coordinated school health program. It emphasizes goals for elementary school programs, current research related to the 10 priority school health content areas, program development and organization, community and national partnerships, and instructional methods and student assessment in elementary school health education/promotion. No field experience required.

SHED 401. Elementary School Health Program. 4 Hours.
Designed specifically for our majors, this course provides an overview of the elementary coordinated school health program. It emphasizes goals for elementary school programs, current research related to the 10 priority school health content areas, program development and organization, community and national partnerships, and instructional methods and student assessment in elementary school health education/promotion. It culminates in a field experience.

SHED 402. Secondary School Health Program. 4 Hours.
This course provides an overview of the coordinated school health program for secondary schools. It includes goals for the secondary school program, a review of current research related to the 10 priority school health content areas, organizing the program, participating in community and national partnerships, and instructional methods and student assessment in secondary school health education and promotion.

SHED 403. Health in the School Community. 3 Hours.
Examines the role of public schools as an important community in which health promotion takes place. Additionally, we discuss the major structural and social forces that influence school and student health outcomes and consider the unique needs of diverse communities of children, adolescents, and families represented within the broader school organization.

SHED 450. Contemporary Issues in School Health. 3 Hours.
This course addresses current and emerging issues in child and adolescent health that should be of significance to school health educators. These issues include public health and prevention priorities related to the top causes of premature death and disability among children and adolescents as well as developmental risk factors associated with diminished health throughout the lifespan.

SHED 480. Supervised Field Experience in School Health. 3 Hours.
This course emphasizes applying the pedagogical skills and content-based learning acquired in the school health academic curriculum to developing, delivering, and evaluating school health lessons and programs in professional practice. With the support and assistance of the course instructor, students will develop original school health programming, implement those programs in the field, and evaluate relevant student, faculty, and community outcomes.

SHED 485. School Health Teaching Seminar. 2 Hours.
This course is designed for students who plan to complete their student teaching requirement in health education. The format of the course will include lecture, discussion, and student teaching in a public school.

SM 125. Sport Facility Management. 3 Hours.
This course is designed to introduce the concepts, principles, and practices related to sport facility management and explore contemporary challenges and trends.

SM 137. Sport Event Management. 3 Hours.
This course is designed to introduce the concepts, principles, and practices related to sport event management and explore contemporary challenges and trends.

SM 221. NIL (Name, Image, and Likeness): Personal Branding Strategies. 3 Hours.
Covers ways for individuals to build strong, positive, and engaging personal brands. It will detail opportunities, marketing strategies, best practices, pitches, and how to capitalize on NIL opportunities.

SM 225. Practicum in Collegiate Athletics. 2 Hours.
PR: SM 167. This course provides students with the opportunity to gain supervised experience working in collegiate athletics. Students learn about the operations of the many units of a collegiate athletic department. Students are then then placed within one or more units of a collegiate athletic department to work under the supervision of a professional within that unit.

SM 240. Sport Governance. 3 Hours.
This course examines how sport organizations interact and coordinate with numerous policy actors to facilitate and coordinate the mechanisms of governance.

SM 275. The Olympic Games. 3 Hours.
An examination of the historical development of the Olympic Games from the Greek classic period (500 B.C.) to the games of the XXXI Olympiad of Rio de Janeiro in 2016.

SM 287. Contemporary Issues in Sport Management. 3 Hours.
Explore issues and trends across the contemporary sport management landscape, including emergent problems and solutions related to the business and leadership of sport. Examine personal strengths, weaknesses, skills, motives, and goals in critical decision-making and conflict resolution in sport management scenarios.

SM 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SM 310. Esports Business. 3 Hours.
Students will learn about the esports market as a sub-set of the larger gaming industry. The course will explore the different roles of the developer, publisher, esports organizations, and the esports teams, what kinds of investments are relevant to each of those stakeholders, and what their financial concerns are.

SM 321. Esports Governance. 3 Hours.
This course provides an in-depth look at the governance and structure of esports. Students will examine esports leagues, teams, gaming publishers, and current events happening in esports with a focus on the law and ethical adherence to rules governing these competitions.

SM 322. Esports Marketing. 3 Hours.
Students in this course will be given an overview of the esports industry and its connections to the broader entertainment and communication industries. The course will explore the relationship between individual talent (from players to influencers) to professional organizations and the esports companies and how promotions, sponsorship, and marketing strategies can be developed to the benefit of all the stakeholders.

SM 345. Technology in Sport Management. 2 Hours.
PR: Majors only. This course provides an understanding of the technological concepts and principles relevant to sport management and provides student with practical experiences in the use of emerging technologies in the field.

SM 355. Orientation in Sport Management. 1 Hour.
PR: Majors only. In this course students will identify and develop the skill sets necessary for successful completion of an internship in sport management.

SM 370. Sport Finance and Economics. 3 Hours.
Provide financial and economic overview of professional, collegiate and recreational sports. Students will learn financial structures of sport organizations and various economic principles applied to the sport industry.

SM 375. Sport in the Global Market. 3 Hours.
An examination of the role of sports within the broader process of globalization. Its impact on culture, politics, economics and how these influences shape today's sport.

SM 380. History of American Sports. 3 Hours.
Acquaint students with philosophical issues related to sport and sport management and with individuals and events that helped shape the history of American sport.

SM 426. Liability in Sport. 3 Hours.
An overview of the legal system as it applies to sport, including contracts, tort law, drug testing, types of athletes, product liability, and legal duties of coaches, facilities supervisors, and athletic directors.

SM 485. Management of Sport Organizations. 3 Hours.
The purpose of this course is to facilitate a full understanding of management theory within sport organizations. This class will demonstrate the value of applying management concepts and theories with sport organizations. Finally, this class will explain the importance of contemporary management tactics, and their relevance to the skill sets needed for students planning a career in sport related professions.

SM 486. Sport Marketing & Sales. 3 Hours.
Marketing principles as they relate to sport organizations. Specific attention is focused on the marketing planning process, marketing informational systems, and internal marketing.

SM 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

SM 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

SM 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

SM 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SM 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

SM 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

SM 496. Senior Thesis. 1-3 Hours.
PR: Consent.

SM 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

SOC 101. Introduction to Sociology. 3 Hours.
Basic course intended to develop a perspective about the nature of social processes and the structure of society.

SOC 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

SOC 207. Social Problems in Contemporary America. 3 Hours.
Sociological analysis of the causes, effects and approaches to preventing and reducing social problems in American society.

SOC 221. Families and Society. 3 Hours.
Historical comparative approach to changing structure and functions of the family institution. Effect of economic, demographic, and cultural changes on relationships, gender roles, marriage, childcare; variations by socioeconomic status, race, ethnicity, gender, sexual orientation.

SOC 225. Inequality and the Media. 3 Hours.
Analyzes how media reflects and shapes inequalities in society with emphasis on race, class, gender, and sexual orientation. Content is based on research findings derived from studies of contemporary society and media.

SOC 226. Sexuality and Society. 3 Hours.
Examines sociological perspectives on sexuality, sexual identity, and associated attitudes and beliefs. Emphasis is given to processes through which these concepts and our understandings of them are socially constructed.

SOC 235. Race and Ethnic Relations. 3 Hours.
Racial and ethnic groups are examined in terms of their history, transformation over time, and the contemporary conditions and issues they face. Emphasis is on prejudice as well as systemic racism.

SOC 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SOC 301. Sociological Theory. 3 Hours.
PR: SOC 101 and (STAT 201 or STAT 211) and PR or CONC: ANTH 105. Systematic analysis of major sociological theories viewed from the historical perspective and in terms of current research.

SOC 304. Complex Organizations. 3 Hours.
The structure and functioning of large-scale, bureaucratic organizations, including studies of industrial organizations, prisons, hospitals, and government.

SOC 311. Social Research Methods. 3 Hours.
PR: SOC 101 and (STAT 201 or STAT 211 or ECON 225). Logic of social research, elements of research design, and problems of measurement, with emphasis on survey research methodology and data analysis.

SOC 312. Death and Dying. 3 Hours.
This course explains the issues and problems associated with death in American society. Topics such as changing attitudes, grief, funeral practices, life after death, the dying patient, and widowhood are presented from a variety of perspectives.

SOC 320. Social Psychology. 3 Hours.
PR: SOC 101. Provides a basic but detailed knowledge of the tenets of sociological social psychology, with an emphasis on symbolic interaction. Focuses on how individual identity is formed through a social process.

SOC 323. Sociology of Rural Life. 3 Hours.
PR: SOC 101 or consent. Social aspects of rural living. Characteristics of rural population, social structure, and institutional arrangements: family, community, education, religion, recreation, health, welfare, and local government.

SOC 331. Sociology of Law. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101) or consent. Development and practice of law as part of social systems; theoretical treatments of the relationship between law and social order; emphasis on issues of class, race, and gender.

SOC 335. Sociology of Religion. 3 Hours.
Examines relationships among religion, the economy, political structure, and social structure. Focuses on factors that shape religious beliefs, practices, and organizations and how those, in turn, affect other areas of life. Covers the rise of secularism and the rationalization of modern life as well as the factors that affect recruitment, commitment, and exit from religious groups.

SOC 337. Sociology of American Business. 3 Hours.
The changing role of business and the debate over its social responsibilities are the major issues of the course. Corporate structures, ownership, governance, power, policy, crime, philanthropy, and work life are examined.

SOC 360. Sociology of Gender. 3 Hours.
Sociological study of gender in modern society with an emphasis on gender stratification. Explores the social, structural, historical, and cultural bases of gender relations. Structured around issues of theoretical debate and discusses the myths, misconceptions, and stereotypes surrounding gender. Covers such topics as gender and work, education, politics, economics, marriage, family, and crime.

SOC 361. Practicing Sociology and Anthropology. 1 Hour.
Career applications of sociological and anthropological knowledge and skills and practical concerns with preparing for life after graduation. Provides for personalized career exploration and planning.

SOC 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SOC 405. Class, Status, and Power. 3 Hours.
PR: Junior standing or consent. Sociological study of inequality within the U.S. with an emphasis on social class and socio-economic status; also highlights the intersection of gender, race/ethnicity, sexual orientation, place, age, ability, and poverty.

SOC 417. Sociology of Globalization. 3 Hours.
Examines the social origins and implications of the growing interconnectedness of our world. Emphasis is given to economic, political, cultural, and environmental dimensions of globalization.

SOC 463. Economy and Society. 3 Hours.
Examines the role that the economy as a social institution plays in the historical paradigms in sociology and modern social theory, as well as in organization and inequality models in sociology.

SOC 470. Cities and Urban Life. 3 Hours.
PR: CRIM 232 and (CRIM 234 or CJ 101). This course introduces students to the scientific study of urban social activity and urban problems, including crime. The primary goals are to present the methods, theories, and key concepts of sociological perspectives on cities.

SOC 481. Society and Health. 3 Hours.
Examines the social causes and consequences of health and illness, including the health care structure, as related to culture, norms and social institutions.

SOC 488. The Capstone Experience. 3 Hours.
PR: SOC 301 and SOC 311 and senior standing. Senior capstone seminar in which students articulate how sociologists, criminologists and/or anthropologists come to an understanding of the social world and the human condition, and the significance of that knowledge. Students conduct in-depth research projects under the guidance of the course instructor, oriented to course-specific substantive emphases and ways of engaging with theory and evidence.

SOC 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

SOC 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

SOC 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SOC 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

SOC 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

SOC 497. Research. 1-6 Hours.
Independent research projects.

SOC 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

SOWK 147. Human Diversity. 3 Hours.
(Must be completed before applying to the major.) Covers a range of diverse populations especially those historically subjected to oppression and social and economic injustice. Addresses the causes and effects of institutionalized forms of oppression.

SOWK 151. Introduction to Social Work. 3 Hours.
A historical and philosophical overview of Social Work as a profession and field of study. Using case studies and real-world examples, this course examines the history of social institutions and their effectiveness in alleviating social problems including topics related to historically oppressed and marginalized populations, changes in the American family, and historical and current trends related to various social services.

SOWK 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

SOWK 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SOWK 297. Research. 1-6 Hours.
Independent research projects.

SOWK 300. Social Welfare Policy and Services 1. 3 Hours.
PR: SOWK 151. Review of current and historical perspectives on the social welfare institution. Includes philosophical and ideological factors that influence U.S. social welfare policy and services.

SOWK 310. Social Welfare Policy and Services 2. 3 Hours.
PR: SOWK 300. Explores the social welfare policy-making process. Analyzes current social welfare programs and possible reforms, policy responses to social issues, and strategies for shaping and influencing policy and their impact on vulnerable populations.

SOWK 320. Social Work Methods 1. 3 Hours.
PR: SOWK 147 and SOWK 151. Presents a broad range of generalist practice knowledge, values and skills. Focuses on theories and interventions with individuals, and introduces evaluation of practice effectiveness. (30-hour service learning requirement.).

SOWK 322. Social Work Methods 2. 3 Hours.
PR: SOWK 320. Builds on Methods 1 by focusing on more specific theories, methods, and intervention models with groups, communities, and organizations. Introduces program evaluation. (30-hour service learning requirement.).

SOWK 324. Methods 3: Organizations and Communities. 3 Hours.
PR: SOWK 320 and SOWK 322. Focuses on applying theories and concepts of generalist social work practice at the macro (organization/community) system level with an emphasis on rural environments.

SOWK 330. Human Behavior in the Social Environment. 3 Hours.
PR: SOWK 147 and SOWK 151 with a minimum grade of C- in each. Overview of human behavior in the social environment. Uses a multi-theoretical approach to explore human development as well as human behavior within families, groups, organizations, and communities. Highlights diversity, intersectionality, and influence of the rural environment.

SOWK 345. Interprofessional Social Justice Practice. 3 Hours.
PR: SOWK 322 with a minimum grade of C-. This course focuses on the theory and practice of interprofessional practice with special attention given to issues of diversity, anti-racism, equity, and inclusion. Students will learn how to communicate effectively with other professionals in various social work settings using anti-racist and anti-oppressive practices.

SOWK 360. Social Work Research and Statistics. 3 Hours.
PR: SOWK 300. Introduces and applies research and statistical methods social workers use to evaluate practice and programs, to critique research, to build knowledge for practice, and to address ethical standards of scientific inquiry.

SOWK 370. Wellness and Resilience for the Helping Professions and Beyond. 3 Hours.
Teaching of skills to acquire resilience in the face of commonly experienced stressors and difficulties. Presents a personalized set of strategies and skills for self-care and resilience to optimize academic and collegiate experiences, including field placements, and future career in the helping professions.

SOWK 380. Child Welfare. 3 Hours.
Introduction to issues in the field of child welfare. Includes policies, practice, protective services, family centered services, prevention, out of home placement, and in-home placement.

SOWK 400. Legal Issues in Social Work. 3 Hours.
PR: SOWK 300 and SOWK 320 and SOWK 330. Explores legal and ethical issues and obligations affecting social workers and social work practice.

SOWK 401. Social Work Practice and Human Sexuality. 3 Hours.
PR: SOWK 320 and SOWK 330. Focus on issues of sexuality that impact direct/micro and mezzo practice, and indirect/macro social work practice.

SOWK 402. Practice and Family Violence. 3 Hours.
PR: SOWK 300 and SOWK 320 and SOWK 330 with a minimum grade of C- in each. Exploration of generalist Social Work practice with individuals who utilize services from the Child Protective Services and Intimate Partner Violence areas of practice. Primary focus is on learning and utilizing direct-practice skills for assessment and effective, best-practice interventions with families experiencing violence within their homes.

SOWK 403. Social Issues of Public Health. 6 Hours.
Examines issues related to assessment and intervention in community health/mental health in Vietnam and Cambodia.

SOWK 404. Social Work Practice and End of Life Care. 3 Hours.
PR: SOWK 300 and SOWK 320 and SOWK 330. Applies a multidisciplinary and multidimensional approach to the study of end of life. Addresses death, dying, and bereavement across the lifespan.

SOWK 481. Senior Capstone. 3 Hours.
PR: Completion of advanced SOWK courses with a grade of C- or higher in each course. Provides educational direction and support for students' field placement experience. Assists students in the integration, mastery, and application of practice theory in conjunction with placement learning activities, and provides opportunities to apply research to practice by evaluating the effectiveness of practice and programs.

SOWK 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice such as a tutor or assistant.

SOWK 491. Professional Field Experience. 1-12 Hours.
PR: Consent. (May be repeated up to a maximum of 12 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

SOWK 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SOWK 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

SOWK 494A. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

SOWK 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

SOWK 497. Research. 1-15 Hours.
Independent research projects.

SOWK 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service-learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

SPAN 101. Elementary Spanish 1. 3 Hours.
PR: Score of S1 on placement test or no prior study of the language or departmental consent. Introduction to the sound and writing systems of the language with emphasis on listening, speaking, reading and writing within an authentic cultural context. (Course presumes no prior knowledge of the language.).

SPAN 102. Elementary Spanish 2. 3 Hours.
PR: SPAN 101 or score of S2 on placement exam. Continuation of SPAN 101. Introduction to the sound and writing systems of the language with emphasis on listening, speaking, reading, and writing within an authentic cultural context.

SPAN 203. Intermediate Spanish 1. 3 Hours.
PR: SPAN 102 or score of S3 on placement exam. Continuation of SPAN 102.

SPAN 204. Intermediate Spanish 2. 3 Hours.
PR: SPAN 203 or score of S4 on placement exam. Foundation for advanced study of Spanish. Emphasis on oral and written communication.

SPAN 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SPAN 298. Honors. 1-3 Hours.
PR: Student in Honors Program and consent by the honors director. Independent reading, study or research.

SPAN 310. Spanish for Heritage Speakers. 3 Hours.
Grammar, reading, writing, and culture for heritage speakers of Spanish with little or no formal education in Spanish language.

SPAN 311. Readings in Spanish. 3 Hours.
PR: SPAN 200 or SPAN 204 or a satisfactory score on the Spanish placement test. Major emphasis on improving reading skills in Spanish through comprehension exercises, discussion, and written analyses. Grammar review when appropriate.

SPAN 312. Writing in the Hispanic World. 3 Hours.
PR: SPAN 200 or SPAN 204 or a satisfactory score on the Spanish placement test. Major emphasis on improving writing skills in Spanish such as description, narration and argumentation through exposure to different types of cultural texts.

SPAN 313. Spanish Through Media. 3 Hours.
PR: SPAN 310 or SPAN 311 or SPAN 312. Explores Spanish language and Hispanic cultures through audio-visual materials.

SPAN 314. Spanish Conversation. 3 Hours.
PR: SPAN 311 or SPAN 312 or SPAN 313. Conversational skills are emphasized through class discussions and oral reports. Students cannot receive credit for both this course and SPAN 310.

SPAN 315. Spanish for Professional Purposes. 3 Hours.
PR: SPAN 204 or equivalent. Specialized vocabulary, grammar, and syntax for students in the legal system, public health, banking and finance fields, information technology, real estate, and human resources. Provides students with the opportunity to apply their skills to actual functional, practical, and relevant content, with particular emphasis on their areas of study.

SPAN 330. Latin American Culture. 3 Hours.
PR: Two courses from SPAN 310, SPAN 311, SPAN 312, SPAN 313, SPAN 314. Survey of Latin American Civilization and culture from Pre-Columbian period to the present.

SPAN 331. Early Spanish American Literature. 3 Hours.
PR: Two 300-level SPAN courses. Readings in Spanish American literature from the colonial period to Modernism.

SPAN 332. Modern Spanish American Literature. 3 Hours.
PR: Two 300-level SPAN courses. Readings in Spanish American literature from Modernism to the present.

SPAN 333. Spanish American Literature. 3 Hours.
PR: Two 300- level SPAN courses. Readings in Spanish American literature from the colonial period to the present.

SPAN 334. Seminar in Spanish American Literature. 3 Hours.
PR: Two courses from SPAN 310, SPAN 311, SPAN 312, SPAN 313, SPAN 314. In-depth study of key words of the Spanish American literary canon.

SPAN 335. Seminar in Spanish-American Culture. 3 Hours.
PR: 2 courses from SPAN 310, SPAN 311, SPAN 312, SPAN 313, SPAN 314. Examination of media, film, dance, music, visual arts, food, or other non-literary cultural production of Spanish America.

SPAN 340. Culture of Spain. 3 Hours.
PR: Two courses from SPAN 310, SPAN 311, SPAN 312, SPAN 313, SPAN 314. Survey of Spanish civilization and culture from its origins to the present day.

SPAN 341. Early Literature of Spain. 3 Hours.
PR: SPAN 304. Readings in Spanish literature from the medieval period to the eighteenth century.

SPAN 342. Modern Literature of Spain. 3 Hours.
PR: Two courses from SPAN 310, SPAN 311, SPAN 312, SPAN 313, SPAN 314. Readings in Spanish literature from the eighteenth century to the present.

SPAN 343. Spanish Literature. 3 Hours.
PR: Two 300-level SPAN courses. Readings in Spanish literature from the medieval period to the present.

SPAN 345. Seminar in Spanish Culture. 3 Hours.
PR: Two courses from SPAN 310, SPAN 311, SPAN 312, SPAN 314. Examination of media, film, dance, music, visual arts, food, or other non-literary cultural productions of Spain.

SPAN 350. Phonetics and Pronunciation. 3 Hours.
PR: Two of the following: SPAN 310, SPAN 311, SPAN 312, SPAN 313, SPAN 314, or consent. Introduces key concepts and terminology associated with the sound system of Spanish and prepares students to improve their pronunciation.

SPAN 351. Spanish in the United States. 3 Hours.
PR: ((SPAN 311 and (SPAN 312 or SPAN 313 or SPAN 314)) or ((SPAN 312 and (SPAN 313 or SPAN 314)) or (SPAN 313 and SPAN 314). Presentation of wide variety of topics regarding the Spanish language in the United States from linguistic descriptions (at the phonetic, phonological, morphological and syntactic levels) to the social aspects of the language (bilingualism, linguistic attitudes and racism, identity issues, educational matters, etc.). Readings and in-class discussions will foster critical thinking and research from a sociolinguistic perspective.

SPAN 360. Intensive Advanced Spanish in Latin America. 3-6 Hours.
PR: SPAN 204. Development of advanced reading writing, listening, and speaking skills taught on location, as part of a faculty-led program in Latin America.

SPAN 361. Commercial Spanish. 3 Hours.
PR: Two courses from SPAN 310, SPAN 311, SPAN 312, SPAN 313, SPAN 314. Development of advanced speaking, reading, and writing skills appropriate for business contexts within the Spanish-speaking world.

SPAN 370. Advanced Spanish Language in Spain. 3 Hours.
PR: SPAN 204 or SPAN 200 or score of 494 or higher on placement test. Overview of reading writing, listening and speaking skills taught on location, as part of a faculty-led summer program in Spain.

SPAN 371. Introduction to Spanish Culture in Spain. 3 Hours.
PR: SPAN 204 or SPAN 200 or a score of 494 or higher on placement test. Overview of Spanish culture taught on location as part of the faculty-led summer program in Spain.

SPAN 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SPAN 401. Grammar Review. 3 Hours.
Intensive grammar review for graduate students. (Credit does not count toward 36 hours required for master's degree.).

SPAN 480. Issues in the Hispanic World. 3 Hours.
PR: Completion of 21 upper division hours in Spanish. An examination of contemporary issues facing the Hispanic world, with particular attention given to cultural developments and influences.

SPAN 481. Hispanic Presence in the World. 3 Hours.
Completion of 21 upper-division hours in Spanish. This course is designed to provide Spanish majors with a capstone experience and offers them a more comprehensive view of the role of Spanish in the world.

SPAN 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

SPAN 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

SPAN 492. Directed Study. 1-3 Hours.
Directed study, reading, and/or research.

SPAN 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SPAN 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

SPAN 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

SPAN 496. Senior Thesis. 1-3 Hours.
PR: Consent.

SPAN 497. Research. 1-6 Hours.
Independent research projects.

SPAN 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

SPED 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SPED 364. Individualized Educational Programming. 3 Hours.
PR: SPED 304. Individualized curriculum planning and instructional program design for students with mild disabilities at elementary and secondary school levels; evidence-based practice in special and inclusive classrooms; lesson planning, implementation and evaluation.

SPED 365. Technology and Universal Design for Learning. 3 Hours.
Application of computer hardware and software, adaptive and assistive devices, instructional and productivity software, and principles and practices of Universal Design for Learning for students with special needs.

SPED 366. Transition Planning. 3 Hours.
PR: SPED 304. Assessment, planning, and programs to promote transition to post-secondary education and employment for students with special needs through individual transition plan process.

SPED 381. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381A. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381B. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381C. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381D. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381E. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381F. Special Problems and Workshop in Special Education. 2-4 Hours.
PR:Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381G. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381H. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381I. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381J. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381K. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381L. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381M. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381N. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381O. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381P. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381Q. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381R. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381S. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381T. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381U. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381V. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381W. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381X. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381Y. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 381Z. Special Problems and Workshop in Special Education. 2-4 Hours.
PR: Consent. To take care of credits for special workshops and short intensive unit course on methods, supervision, and other special topics.

SPED 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SPED 401. Academic Interventions for Special Needs. 3 Hours.
Curriculum development and instructional programming across academic content areas for students with mild/moderate disabilities.

SPED 402. Educational Assessment for Students with Special Needs. 3 Hours.
Formal and informal assessment procedures for eligibility decisions, program development, and progress assessment in special education, assessment accommodations, designing appropriate educational programs from assessment data.

SPED 403. Behavior Support for Students with Special Needs. 3 Hours.
Theory and classroom application of intervention procedures to implement behavior changes in students with special needs; effective group and individual behavior management.

SPED 404. Special Education in Contemporary Society. 3 Hours.
Students will gain the essential knowledge, skills, attitudes, and beliefs necessary for creating learning environments that enable every student to achieve their maximum potential. Students will gain insight into the experiences of exceptional students and their families, as well as the educators who support exceptional individuals throughout their lifetimes.

SPED 419. Internship: Preschool Special Needs. 6 Hours.
Internship or advanced student teaching for certification or additional endorsement to work with children ages birth to pre-kindergarten with special needs.

SPED 460. Differentiation of Instruction. 3 Hours.
This course is designed to prepare prospective general and special education teachers to differentiate instruction to effectively meet the academic and social needs of the full range of students in inclusive settings within their schools.

SPED 463. Collaborative-Consultative Inclusion Strategies. 3 Hours.
Strategies for building and maintaining effective collaborative teams for the inclusive school environment; skills for communication, decision making, group dynamics, and conflict resolution.

SPED 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

SPED 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated for a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

SPED 492. Directed Study. 1-3 Hours.
Directed study reading and/or research.

SPED 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SPED 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

SPED 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

SPED 496. Senior Thesis. 1-3 Hours.
PR: Consent.

SPED 497. Research. 1-6 Hours.
Independent research projects.

SPSC 127. Program Delivery and Management in Community and Campus Sport. 3 Hours.
Explore the structure, stakeholders, and trends in recreational sports. Develop and manage instructional plans, evaluate programs, and generate revenue to support sport initiatives.

SPSC 227. Operational Leadership in Community and Campus Sport. 3 Hours.
Examine strategic planning, project management, personnel management, budgeting, marketing, and risk management in recreational sports. Develop leadership skills to effectively manage campus and community sport programs.

SPSC 289. Pre-Internship in the Sport Sciences. 3 Hours.
Gain practical experience in a range of sport sciences professions and develop necessary skills expected by employers in the workforce.

SPSC 421. Beyond the Odds: The Operations and Ethics of Sports Gambling. 3 Hours.
This course offers a comprehensive exploration of sports gambling, guiding students through its historical roots, operational mechanics, ethical challenges, and technological advancements. By examining these diverse aspects, students will develop critical insights and practical skills relevant to the rapidly evolving sports gambling landscape.

SPSC 422. Fantasy Sports: Strategy, Analysis, and Innovation. 3 Hours.
This course offers an in-depth exploration of the fantasy sports industry, combining historical perspectives, game mechanics, statistical analysis, and strategic decision-making. Students will delve into the economic, social, and technological impacts of fantasy sports while developing innovative solutions to enhance the fantasy sports experience.

SPSC 423. From Cardboard to Crypto: Practical Insights on Sports Collectibles. 3 Hours.
This course delves into the history, evolution, and market dynamics of trading cards, offering students practical insights into collecting, valuing, and trading these coveted items. Students will gain a comprehensive understanding of the legal, ethical, and technological aspects shaping the sports collectibles industry, preparing them for potential careers or personal involvement in this growing industry.

SRVL 179. Introduction to Service Learning for Student Support Services/TRIO. 1 Hour.
This course allows SSS/TRIO participants to work in small peer groups to complete volunteer work with a local non profit/community partner. Students will acquire transferable skills and knowledge that will be useful in college and as a life-long learner.

SRVL 199. Orientation to Service Learning. 1,2 Hour.
Orientation to degree programs and requirements, departmental resources, curriculum options, student responsibilities and opportunities.

SRVL 200. Serving the Public Schools. 3 Hours.
Provides educational direction and support for students who perform community service in public schools. Students serve as tutors, student advisors, and mentors and help to instill the benefits of higher education.

SRVL 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SRVL 298. Honors. 1-3 Hours.
PR: Student in the Honors Program and consent. Independent reading, study or research.

SRVL 300. Intro to WVU Peer Advocates. 3 Hours.
Professional training in crisis intervention and prevention of student sexual assault and other personal violence. Includes a service-learning component.

SRVL 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SRVL 400. WVU Peer Advocates Advanced. 3 Hours.
PR: SRVL 300. Advanced approaches to responding, advocating, and preventing sexual assault, power based personal violence, and forms of discrimination.

SRVL 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

SRVL 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

SRVL 492. Directed Study. 1-3 Hours.
Directed study, reading, and or research.

SRVL 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SRVL 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

SRVL 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

SRVL 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study, or research.

SRVL 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service learning. The main objective will e to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

STAT 101. Elementary Statistics Corequisite. 1 Hour.
PR: Corequisite of STAT 211. This is a co-requisite support course associated with STAT 211. This course reinforces basic learning and study skills along with foundational mathematical skills necessary to succeed in elementary statistics. Based on the criteria defined by the Math Department, some students are required to register for this course based on placement.

STAT 111. Understanding Statistics. 3 Hours.
Introduction to basic concepts and ideas of statistics. Methodologies and case studies to prepare students to understand the use of statistics in the mass media and professional publications in their major field of study. Not open to students who have earned credit for STAT 211 or STAT 215.

STAT 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

STAT 211. Elementary Statistical Inference. 3 Hours.
PR: MATH 124 or higher, or advanced placement. Basic concepts of descriptive and inferential statistics: descriptive measures, random variables, sampling distributions, estimation, tests of hypotheses, chi-square tests, regression and correlation.

STAT 215. Introduction to Probability and Statistics. 3 Hours.
PR: MATH 156 with a minimum grade of C-. Probability, random variables, discrete and continuous probability distributions, joint probability distributions, and expected value. The central limit theorem. Point and interval estimation and tests of hypotheses. Chi-square tests, linear regression, and correlation.

STAT 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

STAT 298. Honors. 1-3 Hours.
PR: Students in the Honors Program and consent by the honors director. Independent reading, study or research.

STAT 312. Intermediate Statistical Methods. 3 Hours.
PR: (STAT 211 or STAT 215) with a minimum grade of C- or equivalent. Extension of basic concepts of statistical inference: estimation and hypothesis testing for two or more populations, multiple regression and correlation, and analysis of variance.

STAT 313. Introductory Design and Analysis. 3 Hours.
PR: STAT 312 with a minimum grade of C-. Introduction to the linear model, the complete and fractional factorial experiment, and the completely random, randomized complete block, Latin square, and split-plot experimental designs.

STAT 316. Forensic Statistics. 3 Hours.
PR: STAT 215. Probabilistic and statistical evaluation of evidence in forensic science: concepts of uncertainty/variation, discriminating power, coincidence/significance probabilities, historical overview, transfer evidence, DNA profiling, fingerprint identification, biometric identification, and selected forensic statistics topics/ case studies.

STAT 331. Sampling Methods. 3 Hours.
PR: STAT 211 or STAT 215 or equivalent. Methods of sampling from finite populations, choice of sampling unit and sample survey design. Estimation of confidence limits and optimum sample size. Single and multi-stage sampling procedures.

STAT 421. Statistical Analysis System (SAS). 3 Hours.
PR: (STAT 211 or STAT 215 or equivalent) and (CS 110 or equivalent). Introduction to the use of the Statistical Analysis System (SAS), a statistical computer program. Students will perform statistical data analysis, data file modifications, and statistical report writing.

STAT 423. Bioinformatics Computing. 3 Hours.
PR: STAT 312. Introduction to R computing within a bioinformatics context. Topics include: R packages, data structures, objects, and data input/output; R data Visualization; R/Perl text processing; accessing bioinformatics databases; and R interfaces to Perl, Java, and SQL databases.

STAT 445. Introductory Regression Analysis. 3 Hours.
PR: STAT 312 with a minimum grade of C-. Analyses of simulated or real data with a focus on the least squares matrix approach to the linear model. Use of diagnostic measures to assess and improve model adequacy leading to practical model-based inferences or predictions.

STAT 461. Introduction to Probability Theory. 3 Hours.
PR: MATH 251 with a minimum grade of C-. Theoretical coverage of probability, random variables, and discrete and continuous probability distributions. Expected value, moment generating functions, and special probability distributions. Random sampling, distributions of certain functions of random variables, and the central limit theorem.

STAT 462. Theoretical Introduction to Statistical Inference. 3 Hours.
PR: STAT 461 with a minimum grade of C-. Theoretical introduction to statistical inference. Properties of estimators and techniques of estimation. Hypotheses testing including the Neyman-Pearson Lemma and likelihood ratio tests. Regression and correlation.

STAT 480. Capstone Design. 1 Hour.
Design of a research project in consultation with advisor(s). Practice of effective written and oral communication; engagement of students in purposeful writing in mathematics.

STAT 481. Capstone Experience. 2 Hours.
PR: STAT 480 with a minimum grade of C-. Implementation of research project in consultation with advisor(s). Practice of effective written and oral communication; engagement of students in purposeful writing in mathematics.

STAT 482. Statistics Practicum. 1 Hour.
PR: STAT 313. A capstone experience core course. Students are expected to: research and design (optionally) a study, do independent statistical analyses of a data set, and present the results in both verbal and written forms.

STAT 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

STAT 491. Professional Field Experience: Capstone. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

STAT 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

STAT 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

STAT 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

STAT 496. Senior Thesis. 1-3 Hours.
PR: Consent.

STAT 497. Research. 1-6 Hours.
PR: Consent. Independent research projects.

STAT 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

STCM 315. Strategic Advertising and Public Relations Writing. 3 Hours.
PR: (ADPR 215 or ADV 215 or PR 215 or STCM 215) and (JRL 215 or MDIA 215) with a minimum grade of C- in each. This class provides exposure to and practice in developing the kinds of writing required in advertising and public relations careers. (Course is equivalent to ADV 315 & PR 324.).

STCM 319. Advertising and Public Relations Design. 3 Hours.
PR: JRL 215 and (ADV 215 or PR 215 or STCM 215) with a minimum grade of C- in each. This course is an introduction to the Adobe Creative Suite and will cover the basics of Adobe Acrobat, InDesign, Illustrator and Photoshop software. Students will learn the vocabulary, methods, processes and necessary skills to produce professional layouts and design for advertising and public relations work in various media to reach diverse audiences.

STCM 499. Global Service Learning. 1-3 Hours.
PR: Consent. Theory and practice of global service learning. The main objective will be to pair the experiential aspects of meaningful and sustained service in the host community with work from the student's anchor course by offering a methodological framework for cultural immersion and community service as well as adding to the content of the anchor course.

SUST 101. Sustainable Earth. 3 Hours.
Introduction to Earth system processes, human impacts on the environment, and sustainability. Both human and environmental sustainability are emphasized in topics related to Earth materials, climate change, the origin of landforms, natural hazards (earthquakes, volcanoes, landslides, and floods), sustainable energy, and water resources.

SUST 101L. Sustainable Earth Laboratory. 1 Hour.
PR or CONC: SUST 101. Laboratory study of climate change, sustainability of natural resources, and geologic hazards through examination of data sets, case studies and critical analyses of coupled human-environment interactions.

SUST 102. Global Sustainability. 3 Hours.
Focuses on how individuals, communities and institutions located in regions across the world are responding to the challenges of social, economic and environmental change. Students study distinctive patterns of change in rural and urban areas as well as the response from institutions across scales from local to international levels. Students explore how individuals and organizations develop solutions to sustainability.

SUST 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

SUST 201. Earth System Science. 3 Hours.
PR: SUST 101 and SUST 101L and PR or CONC: SUST 201L. Scientific study of the Earth systems, including hydrosphere, lithosphere, atmosphere, cryosphere and biosphere, and their interactions. Emphasize earth materials, the use of data to predict natural hazards, how exploration and production of natural resources is conducted and the implications for environmental change and sustainability of human civilization.

SUST 201L. Earth System Science Laboratory. 1 Hour.
PR: SUST 101 and SUST 101L and PR or CONC: SUST 201. Application of methods used by geoscientists to study the earth, including mineral, rock and fossils identification, and data presented in maps, graphs, diagrams and models to interpret the spatial distribution and temporal development of hazards, resources and climate-induced environmental changes.

SUST 202. Just Sustainable Development. 3 Hours.
Advances student knowledge in the field of sustainability studies by exploring the role and responsibilities of individuals, institutions, and communities to create a future that is environmentally sustainable and socially just. Building upon a base knowledge of geographical and earth science concepts, this course prepares students to consider the ethical implications and decision-making processes that contribute to sustainable development.

SUST 202L. Sustainable Development Laboratory. 1 Hour.
PR or CONC: SUST 202. Application of story mapping to sustainability studies research, analysis and data visualization methods to measure progress toward and communicate about the UN Sustainable Development Goals. Students will learn geographic information and story mapping skills associated with online research, media literacy and data literacy while building a digital story map focused on measuring progress toward the UN Sustainable Development Goals.

SUST 207. Climate System Science. 3 Hours.
PR or CONC: SUST 207L. Investigation of the atmosphere and hydrosphere using a system science approach in the context of sustainability. Course is focused on the description, explanation, and understanding of the physical and chemical processes that govern Earths' climate and weather, atmospheric processes, and the hydrologic cycle.

SUST 207L. Climate System Science Laboratory. 1 Hour.
PR or CONC: SUST 207. Laboratory study of Earth's climate and hydrologic systems focused on meteorological data analysis.

SUST 240. Earth Data Analytics. 3 Hours.
PR: (MATH 124 or MATH 126 or MATH 129) with a minimum grade of C-. Introduction to quantitative analysis of data, including methods for extracting actionable information to guide decision-making in Earth science and Sustainability applications. Students are introduced to coding, open-source data science software packages, basic statistical methods, and best practices in undertaking reproducible science.

SUST 250. Digital Earth and GIS. 3 Hours.
PR or CONC: SUST 250L. Explores the concepts, principles, and practices of acquiring, storing, analyzing, displaying, and using geospatial data and investigates the science behind geographic information systems and the techniques and methods GIS scientists and professionals use to generate data, answer questions, and inform decision making. Explores the role of geospatial technologies in society and associated ethical practices.

SUST 250L. Digital Earth and GIS Laboratory. 1 Hour.
PR or CONC: SUST 250. Laboratory exploration of the concepts, principles, and practices of acquiring, storing, analyzing, displaying, and using geospatial data. Students gain experience working with geospatial data and software.

SUST 260. Natural Disasters. 3 Hours.
Introduction to natural disasters and the natural processes and human actions that cause them. This course will introduce common natural disasters (including floods, landslides, earthquakes, volcanoes, and tsunamis) and investigate their frequency, magnitude, global distribution, and impacts on society. The course will also discuss the promise and pitfalls of common natural disaster mitigation techniques.

SUST 302. Research for Sustainable Development. 3 Hours.
Focuses on qualitative research methods to investigate the cultural and spatial dimensions of sustainable development problems, whether at the local, regional, or international scale. Ethnographic and geospatial research skills will be emphasized. Students conduct a small study to practice new research approaches. Introduces the ethics and strategies of collaborative and participatory action research.

SUST 305. Sustainable Governance. 3 Hours.
PR: GEOG 205 or SUST 202. Understand and evaluate the rules, processes, and institutions involved in governance frameworks that promote social and environmental sustainability from the local to global levels. Helps prepare students for careers in politics, the nonprofit sector, consulting, and education. Students will apply skills such as interviewing, writing, and presenting results in different formats to diverse audiences.

SUST 308. Climate Modeling. 3 Hours.
PR: SUST 207 and SUST 240. Explores concepts and methods for generating climate models, forecasts, and predictions with a primary focus on physical process modeling. The first part of the course focuses on a deep exploration of the global climate system and associated physical processes and mathematical representations. The second part of the class focuses on computational methods used in climate modeling.

SUST 340. Urban Sustainability. 3 Hours.
Provides an urban perspective on environmental, socio-economic, and infrastructural sustainability problems and their consequences. Students gain a better understanding of how cities can be a culprit, but also a major part of the solution to today's sustainability challenges. Students take an active role in assessing the sustainability of cities, identifying shortcomings or future needs, and communicating potential solutions.

SUST 372. Sustainable Energy. 3 Hours.
Examines role and history of earth sciences in developing energy resources and assessing the sustainability impacts associated with their development, emphasizing the impact of extraction and production on the environment, from non-renewable fossil fuel sources and related greenhouse gas emissions and climate change to low or no-carbon renewable energy systems.

SUST 388. Careers in Sustainability. 1 Hour.
Development of career goals and preparation for entry in the job market.

SUST 402. Climate and Environmental Justice. 3 Hours.
Fosters a critical understanding of justice by examining the historical roots of climate and environmental inequalities worldwide. Why are some communities exposed to high levels of pollution and lack clean water while others enjoy lower environmental risks? Does inequality contribute to ecosystem degradation and climate change? What is the relationship between social and environmental justice and sustainability?.

SUST 403. Sustainability, Planning and Development. 3 Hours.
PR: SUST 202. Apply key issues in sustainability studies to the fields of regional planning and social action. Students learn approaches to building more sustainable communities at the local and regional level while deepening their understanding of key actors and institutions as well as approaches to shape their policies, practices, and projects to advance sustainable development goals.

SUST 410. Critical Minerals. 3 Hours.
PR or CONC: SUST 201. Formation of critical minerals, such as lithium, nickel, cobalt, graphite, and rare earth elements (REEs); their role in renewable energy generation, energy storage, energy transmission, and other technologies; and practices in sustainable exploration, extraction of conventional and unconventional critical mineral resources.

SUST 420. Geothermal Energy. 3 Hours.
PR: SUST 101. Explores the origin and distribution of Earth's internal heat and the methods used to harness it to provide clean and renewable energy for applications ranging from domestic heat pumps to large electrical power plants.

SUST 430. Subsurface Resources for Energy Transition. 3 Hours.
PR: SUST 201 and SUST 201L. This course covers the fundamentals of carbon dioxide (CO2) and hydrogen (H2) storage, the physical, geochemical, and biological constraints that affect the performance and safety of their storage in subsurface geological formations, and the role of storage in the decarbonization of the energy sector for the sustainable energy transition.

SUST 480. Subsurface Methods. 3 Hours.
PR: (SUST 201 and SUST 201L) and (PHYS 102 or PHYS 112). Students develop the skills to produce subsurface interpretations from integrated geological, geophysical, and engineering datasets using specialized software. They construct maps and 3D visualizations of subsurface structure suitable for assessing geological CO2 or H2 storage, geothermal exploration, or fossil fuel development.

THET 100. First-Year Practicum. 1 Hour.
PR: THET 191. Assigned theatre projects as front-of-house staff for the School's production program. (May be repeated for a maximum of 4 hours.).

THET 101. Introduction to the Theatre. 3 Hours.
(Open to all students.) A survey of the nature and function, the arts and crafts, and major phases in the historical development of the theatre.

THET 102. Acting. 3 Hours.
(Open to all students.) Basic theories and concepts in stage acting for the beginning student. Emphasis on the physical, intellectual, emotional, and personality languages of acting.

THET 103. Stagecraft. 3 Hours.
Fundamentals of scenery construction and technical theatre through formal lecture. Requirements include assignments on running crews for Division productions.

THET 104. Stagecraft Lab. 1 Hour.
PR or CONC: THET 103. (May be repeated for a maximum of 3 credits.) Fundamentals of scenery construction and technical theatre through practical crew experience. Requirements include assignments on scenic construction for Division productions.

THET 105. Costuming. 3 Hours.
Introduction to Stage Costuming through lecture and demonstration. Emphasis on the application of basic sewing skills and processes used in costume construction.

THET 106. Costuming Lab. 1 Hour.
(May be repeated for a maximum of 3 credit hours.) Introduction to stage costuming through practical experience. Emphasis on the application of basic sewing skills and processes used in costume construction for Division productions.

THET 113. Stage Management Principles. 3 Hours.
An examination of the fundamental principles that govern the contemporary stage manager.

THET 120. History of Musical Theatre. 3 Hours.
This course explores American musical theatre, one of this country's primary contributions to world culture, covering its origins, components, and its major creative figures.

THET 144S. Fundamentals of Acting. 3 Hours.
PR: Theatre major. An introduction to the fundamental techniques of acting with a focus on ensemble building, action, imagination, concentration of attention, and objectives. Course projects include structured improvisations and exercises leading to beginning scene study in Realism. Pre-requisite(s) and/or co-requisite(s) may differ on regional campuses.

THET 170. World Theatre and Drama. 3 Hours.
Introduction to theatre and drama traditions in ten world cultures. An intercultural study of theaters, performance and staging practices, the cultural milieu, and dramatic literature.

THET 191. First-Year Seminar. 3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

THET 200. Production Practicum. 1 Hour.
PR: THET 104 or THET 106 or consent. (May be repeated for a maximum of 4 hours.) Assigned theatre projects as an introduction to the elements of theatrical production.

THET 206S. Stage Management Seminar. 1-3 Hours.
PR: THET 113. The practical application of stage managing for a theatrical production.

THET 213. Intermediate Stage Management. 3 Hours.
PR: THET 113. A follow-up course to Stage Management Principles. The course will go into greater depth about stage managing for musicals, dance, and alternate forms of entertainment. Students will practice calling cues to music and choreography. In addition, students will learn to interpret labor law and union contracts, beginning with Actor's Equity Association/LORT rulebook.

THET 214. Production Management Principles. 3 Hours.
PR: THET 113. This course will expand upon the topics discussed in Stage Management Principles, applying a student's knowledge of unions and labor laws to the work of a Theatrical Production Manager. Students will learn about the administrative side of theatrical work, including season planning, calendar development, budgeting, human resources, and crisis management.

THET 219S. Intermediate Costume Construction. 3 Hours.
PR: THET 105. Study and practical application of costume construction techniques and introduction to pattern making with an emphasis on their applications through extensive hands-on experience with construction projects for division productions.

THET 220. Fundamentals of Lighting. 3 Hours.
PR: THET 103. Fundamentals of stage lighting through formal lecture and practical experience. Laboratory requirements include assignments on the lighting/electrics crews for school productions.

THET 221. Theatre Makeup. 3 Hours.
Lecture-laboratory course in art of stage makeup. Practical makeup for the University Theatre productions.

THET 222S. Drafting for the Stage. 3 Hours.
PR: THET 103. Techniques in drafting in accordance with current graphic standards for stage design and technology. Introduction and refinement of technique and graphic style through projects and exercises.

THET 225S. Introduction to Stage Design 1. 3 Hours.
Study elements/principles of two/three dimensional design and application to scenery, lighting and costume design. Emphasis on creative analysis and communication using techniques in drawing, painting, and model making.

THET 226S. Introduction to Stage Design 2. 3 Hours.
PR: THET 225 or THET 225S. Experience applying elements/principles of two/three dimensional design to study of scenery, lighting, and costume design. Studio course focusing on color theory, painting and finishing techniques in model making.

THET 230. Text Analysis. 3 Hours.
For the student theatre practitioner in acting, design, directing, and stage management. Explorations include: anchoring techniques, concept of "pressures," and the parameters of a dramatic event.

THET 231. Advanced Text Analysis. 3 Hours.
PR: THET 230. For the student practitioner in the studio acting program only exploring, in more depth, and with new challenging texts, analysis techniques of THET 230 but with total focus on performing the text.

THET 240S. Fundamental Vocal Technique 1. 2 Hours.
PR: Majors only. Developing the expressive voice. Understanding the anatomy and physiology of the voice, breath and resonance. Release of physical blocks.

THET 242S. Fundamentals of Movement. 2 Hours.
PR: Consent. An investigation into the fundamentals of human movement, and issues of movement in performance. Exercises concentrate on the development of spatial and self-awareness, ensemble skills, and character development.

THET 244. Intermediate Acting. 3 Hours.
PR: THET 144. Continued exploration of acting techniques including exercise work in objectives, beats, actions, personalization, environment improvisation, monologue, and scene study work.

THET 244S. Intermediate Acting. 3 Hours.
PR: THET 144 or THET 144S. Continued exploration of acting techniques including exercise work in objectives, beats, actions, personalization, environment improvisation, monologue, and scene study work.

THET 245. Intermediate Acting. 3 Hours.
PR: THET 244. Continuation of THET 244.

THET 246S. Auditioning and Career Development. 3 Hours.
PR: THET 102 or THET 144 or THET 144S or permission of the instructor. Preparatory and laboratory class in auditioning for theatre, film and television. Examination of the entertainment industry including headshots, resumes, unions, casting, representation, self-branding and promotion, and personal career development.

THET 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

THET 300. Practicum. 1 Hour.
PR: THET 104 or THET 106 or consent. (May be repeated for a maximum of 4 credit hours.) Assigned independent production projects supervised by a faculty mentor.

THET 301. History of Western Theatre. 3 Hours.
A survey of important movements, people, innovations, styles, and traditions in European and American theatre from the Greeks to the present.

THET 302. Directing. 3 Hours.
Fundamental theory and practice of directing for live theatre with emphasis on script analysis, director-actor communication, ground plan, and composition.

THET 310S. Stagecraft 2. 3 Hours.
PR: THET 103. Study of advanced technical procedures including welding, materials, wood joinery, and practical construction problem solving. Emphasis on the practices and development of skills through projects.

THET 312. Theatrical Rigging. 3 Hours.
PR: THET 222S. An examination of the tools, equipment, hardware, and safety practices commonly used in theatrical rigging.

THET 313. Entertainment Management Seminar. 1 Hour.
PR: THET 213. This course serves as a follow-up to Intermediate Stage Management. Students will be exposed to the role of Stage Management in Non-Traditional Entertainment forms, including circus, television/film, Disney parks, Disney theatrical, touring, and many others. Students will execute skills in professional development and etiquette, interview techniques, and networking.

THET 315S. Portfolio Development. 3 Hours.
A 3 hour lab course on techniques of portfolio development focusing on both digital and traditional portfolio formats and related general techniques of graphic design and image preparation.

THET 317. Costume Pattern Drafting Techniques. 3 Hours.
PR: THET 105 and THET 106. This course centers on the practice of interpreting 2-dimensional drawings and pictures into drafts that can be built into a wearable 3-dimensional object. The common application is the creation of custom clothing but can also include hats, shoes, gloves, scarves, crowns, armor, and other accessories. Students will learn the necessary math required to draft the shape of the human form.

THET 321S. Stage Properties. 3 Hours.
PR: THET 103. Techniques and methods for designing and fabricating stage properties for theatrical production. Practical experience in the construction of properties for class projects and for the School's productions.

THET 322S. Scene Design. 3 Hours.
PR: (THET 222 or THET 222S) and (THET 225 or THET 225S). Introduction to the fundamentals of scenic design including conceptualization, development, drafting, rendering, model building and techniques of design presentation.

THET 323S. Advanced Scene Design. 3 Hours.
PR: THET 322 or THET 322S. Advanced study of scenic design with an emphasis on conceptualization, rendering, model building, and alternative forms of design presentation for the performing arts. (May be repeated for a maximum of 9 credit hours.).

THET 324S. Costume Design 1. 3 Hours.
PR: THET 226 or THET 226S. Study of basic design elements as applied to costume design. Script analysis leading to conceptualization and communication through visual language. Experience in practical organization skills, paperwork and budgeting.

THET 325S. Lighting Design. 3 Hours.
PR: THET 220. Experience in the design of stage lighting including conceptualization, drafting and rendering techniques related to the development and presentation of lighting design.

THET 326S. Advanced Costume Design. 3 Hours.
PR: THET 324 or THET 324S. Experience applying the basic principles of costume design to text, movement text, opera, dance, and puppetry. Emphasis on rendering techniques, presentation, composition, and fabric selections. (May be repeated for a maximum of 6 credit hours.).

THET 327S. History of Costume and Decoration 1. 3 Hours.
PR: (THET 225 or THET 225S) and (THET 226 or THET 226S). A historical survey of clothing, artistic style and decoration from ancient Egypt to 1750. Emphasis on how stage designers employ style in the design of costumes, scenery, and properties. (Field trip required.).

THET 328S. History of Costume and Decoration 2. 3 Hours.
PR: (THET 225 or THET 225S) and (THET 226 or THET 226S). A historical survey of clothing, artistic style, and decoration from 1750 to the present. Emphasis on how stage designers employ style in the design of costumes, scenery and properties. (Field trip required.).

THET 329S. Computer Assisted Design for the Stage. 3 Hours.
PR: THET 222 or THET 222S. Study of the graphic applications of computer assisted design and drafting for stage design through project work and exercises in a studio format.

THET 330S. Rendering Techniques. 3 Hours.
This course allows the students to explore and develop different techniques of rendering scenic, costume, and lighting designs. Students will work in watercolor, acrylic, marker, pencil and other media.

THET 340S. Intermediate Vocal Techniques 1. 2 Hours.
PR: (THET 240 or THET 240S) and consent. Extending vocal range, power, and flexibility. Achieving personal connection between words and self. Formation of speech sounds.

THET 341S. Intermediate Vocal Techniques 2. 2 Hours.
PR: (THET 340 or THET 340S) and consent. Developing of flexibility and muscularity of the voice. Phonetics.

THET 342S. Stage Movement 1. 2 Hours.
PR: (THET 242 or THET 242S) and consent. Continuation of THET 242S. Workshop in movement skills related to the actor's craft, including the analysis, description and execution of a broad range of movement qualities.

THET 343S. Stage Movement 2. 2 Hours.
PR: (THET 342 or THET 342S) or consent. An exploration of compositional techniques through the development of original performance material using movement as a basis. Will include a study of the history of theatrical performance art works and artists. (May be repeated for a maximum of 6 credit hours.).

THET 344S. Acting Studio. 3 Hours.
PR: (THET 244 or THET 244S) or consent. The purpose of studio is to reexamine basic acting principles and introduce advanced techniques in characterization, personalization, and given circumstances through exercises, monologue work, and intensive scene study coordinated with rehearsal and performance in THET 345S.

THET 345S. Advanced Acting Studio. 3 Hours.
PR: Consent. Continuation of THET 344S. Applied application of intermediate work in personalization, given circumstances, action, and objectives. Includes rehearsal and performance of play from the Modern Contemporary Theatre.

THET 346S. Actor's Craft. 3 Hours.
PR: THET 244 or THET 244S. Gives the general theatre student a studio style acting class experience, emphasizing exercises and monologue and scene work in a variety of styles.

THET 348S. Studio Scene Study 1. 1 Hour.
PR: THET 244 or THET 244S. The presentation of scenes chosen from modern and contemporary theatre, before a panel of acting, voice, and movement faculty for critique.

THET 352S. Acting the Song. 3 Hours.
PR: THET 144 or THET 144S. Exploration of lyric, rhyme, imagery, storytelling, phrasing, musical composition and overall theme of a song for clues the actor can use in performance.

THET 355S. Musical Theatre Studio. 3 Hours.
PR: (THET 244 or THET 244S) and (MUSC 226 or MUSC 226S). Examine, explore and execute acting techniques and styles applicable to the musical through scene and musical performance study as well as classroom exercises. (May be repeated for a maximum of 6 credit hours.).

THET 360. Western Theatre History 1: Greeks to Restoration. 3 Hours.
A survey of important movements, people, innovations, styles, and traditions in European theatre from Greeks through the period of Restoration. Through lecture presentations, discussions, readings, and tests, students will become familiar with theatrical practices, and figures, across a broad spectrum of contexts, definitions, and approaches in the western theatre canon.

THET 365. Western Theatre History 2: Enlightenment to Contemporary. 3 Hours.
A survey of important movements, people, innovations, styles, and traditions in 19th and 20th century European theatre ranging from the period of Enlightenment to Contemporary. Through lecture presentations, discussions, readings, and tests, students will become familiar with theatrical practices, and figures, across a broad spectrum of contexts, definitions, and approaches in the western theatre canon.

THET 370. Production Dramaturgy. 3 Hours.
PR: THET 112. A process-oriented course dealing with the demands and possibilities for dramaturges in the contemporary theatre. Casebooks and work with other sources contribute to the skill set for dramaturges assisting productions.

THET 375S. Puppet Construction. 3 Hours.
PR: THET 105. This studio class focuses on puppetry through the study of basic mechanical systems, printing, sculpting, sewing and finishing techniques.

THET 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

THET 400. Advanced Production Practicum. 1 Hour.
PR: THET 200 or consent. (May be repeated for a maximum of 6 hours.) Assigned advanced production projects that are supervised by a faculty mentor.

THET 401. Capstone Experience. 3 Hours.
This course provides a culminating senior project for students in the areas of BFA acting, design, puppetry, and children's theatre, as well as for the BA in theatre.

THET 402. Repertory Theatre. 1-6 Hours.
PR: Consent. Rehearsal and performance techniques for producing plays in rotating repertory. Emphasis is on the creation of synthesized company of performers, designers, and technicians. (May be repeated for maximum of 12 credit hours.).

THET 403S. Advanced Directing. 3 Hours.
PR: THET 302. Emphasis on the work of the director as an integrating artist. High level of proficiency in the direction of a one-act play is required of all students enrolled.

THET 404S. Playwriting. 3 Hours.
PR: Consent. Development of basic playwriting techniques. Specific assignments explore characterization, dramatic event, dialogue, tension, compression. Emphasis on the student finding one's own voice, style, and courage to dramatize one's view of the world.

THET 405S. Advanced Playwriting. 3 Hours.
PR: THET 404 or THET 404S. Further exploration of dramatic technique, with emphasis on orchestrating the longer play. Also touches on script analysis of known dramatic texts and on practical problems of a playwriting career.

THET 406S. Advanced Stage Management Seminar. 1-3 Hours.
PR: THET 113 and (THET 206 or THET 206S). The advanced practical application of stage managing, allowing the students more independence to demonstrate a mastery of skills developed in previous coursework. Students are expected to stage manage or assist as Production Manager for a fully produced School of Theatre & Dance production and advise their peers and assistants on communication strategies to facilitate effective production team collaboration.

THET 410. Light Console Programming. 3 Hours.
PR: THET 220. Intermediate to advanced programming methods and procedures for industry standard lighting consoles, including typical lighting console hierarchy and operation and its field application and implementation. Application and development of skills in general lighting electrics, lighting management, and lighting networking set up and troubleshooting.

THET 413. Advanced Stage Management. 3 Hours.
PR: THET 213 and THET 214 with a minimum grade of C- in each. Advanced Stage Management is meant to serve as a final stage management course prior to graduation. Students in this advanced class are expected to examine their personal leadership skills for evaluation and improvement. Students will employ soft skills to better their communication, negotiation, and management styles through career preparation activities and case studies.

THET 414. Advanced Production Management. 3 Hours.
PR: THET 214. Students in this advanced class are expected to learn the intricacies of working with unions other than Actors' Equity Association from an administrative capacity, including advanced budget planning. In addition to unions, students will employ soft skills to better their communication, negotiation, and management styles through career preparation activities and case studies.

THET 417. Tailoring. 3 Hours.
PR: THET 425 or Instructor Approval. The Tailoring course teaching strategies and techniques used in the art of structured garments. The course emphasizes precision, teaching students to block, cut, and stitch accurately and consistently. They will also learn of internal jacket structures, complex pockets, and shaping collars. The key goal for tailoring is to create a crisply stitched garment that fits on an actor.

THET 418. Draping for Costumes. 3 Hours.
PR: THET 219. Draping is the practice of taking a 2-dimensional costume rendering and using fabric to realize that design on a mannequin. Once students learn how to accurately interpret shapes, they will engineer the foundations that make the garment wearable, including internal interfacings, closures, and body shapers. From there, students will learn to correct patterns based on fit.

THET 421S. Lighting Design 2. 3 Hours.
PR: THET 200 and (THET 325 or THET 325S). An advanced study of lighting design with emphasis on design development, cueing, and design refinement during technical rehearsals.

THET 422S. Advanced Stage Makeup. 3 Hours.
PR: THET 221. An advanced study of stage makeup materials and techniques. Intensive focus on facial anatomy, casting, sculpting, and design.

THET 423S. Costume Crafts. 3 Hours.
PR: THET 111 and (THET 425 or THET 425S). Identification and application of the materials and techniques used in the fabrication of costume crafts. Emphasis on research and practical experience through hands on project work.

THET 424. Advanced Technical Production. 3 Hours.
PR: THET 103 and THET 222. Detailed study of the fundamentals and principles of technical direction. The course will examine leadership principles, the flow of information needed to successfully implement a design, different phases of a production/build, budgeting, theatrical construction methods, and how to apply them to given design challenges.

THET 425S. Advanced Costume Construction. 3 Hours.
PR: THET 111. Study and practical application of costume construction techniques through development of flat-pattern drafting skills. Emphasis on use of research to interpret the costume rendering. Extensive hands-on experience with construction projects for Division productions. (May be repeated for a maximum of 6 credit hours).

THET 426. Automation. 3 Hours.
PR: THET 329. Automation is the exploration of motorized equipment used in the arts and how it can be utilized for production purposes. Topics from electricity to mechanical design will be discussed.

THET 427. Lighting Technology. 3 Hours.
PR: THET 220. An advanced study of the tools and technology available to lighting designers with an emphasis on contemporary lighting systems. Including electrical calculations, power distribution, networking and advanced industry specific software.

THET 428S. Scene Painting. 3 Hours.
PR: (THET 322 or THET 322S) and (THET 622 or THET 622S) or consent. An introduction to the basic tools, materials, and techniques of scene painting for the stage.

THET 429S. Sound Seminar. 3 Hours.
PR: THET 103 and THET 104. An exploration of sound design and equipment for the theatre with practical emphasis on producing and recording sound effects using computer software.

THET 433S. Model Building. 3 Hours.
PR: (THET 225 or THET 225S) and (THET 226 or THET 226S). Design and construction methods of the scenographic model are examined. Mastery is attained through the construction of three or four projects in the design studio.

THET 435. Theatre Health and Safety. 3 Hours.
Course investigates common health and safety issues encountered in Theatrical Production. Examines the laws and governing agencies in the theatrical industry. Certifies students in CPR and First Aid.

THET 440S. Advanced Vocal Techniques. 2 Hours.
PR: Consent. Meeting the demands of heightened texts requiring greater emotional and physical commitments. Tutorials.

THET 441S. Advanced Vocal Techniques 2. 2 Hours.
PR: (THET 440 or THET 440S) and consent. Integrating vocal techniques in the context of rehearsal and performance in plays of heightened text and issues of period and style.

THET 442S. Advanced Stage Movement 1. 2 Hours.
PR: (THET 343 or THET 343S) or consent. Practical application of issues of performance theory and composition. Studies in the relationship of text and movement in performance, and in the development of original performance material that uses movement as a point of departure.

THET 443S. Advanced Stage Movement 2. 2 Hours.
PR: (THET 442 or THET 442S) or consent. Intensive study of issues related to physicality i performance; special topics, which may include, but are not limited to stage combat, mask, and large group composition.

THET 444S. Advanced Acting Studio. 3 Hours.
PR: Consent. Continuation of advanced exercises focusing on the works of Shakespeare. Includes verse scansion, text analysis, dynamics, scene study, exercise work and characterization.

THET 445S. Advanced Acting Studio. 3 Hours.
PR: Consent. Continuation of THET 444S. Rehearsal and presentation of style project, (Shakespeare, Comedy of Manners, Shaw, etc.). Also includes seminars in special topics in performance.

THET 447S. Studio Scene Study 2. 1 Hour.
PR: THET 444 or THET 444S. The presentation of scenes chosen from Shakespeare and other plays of heightened text, before a panel of acting, voice and movement faculty for critique.

THET 450S. The Complete Performer. 3 Hours.
PR: (THET 447 or THET 447S) and (THET 455 or THET 455S). This lab-based course employs the best pedagogical approaches to strengthen the abilities of the actor who sings, acts, and dances. Students will work with musicians, lyricists, and book writers toward creating an original musical short, presented at the end of the semester. It is designed to cultivate student ability to compete in the musical theatre community as a triple threat.

THET 455S. Advanced Musical Theatre Studio. 3 Hours.
PR: (THET 344 or THET 344S) and (THET 355 or THET 355S). Presentation of scenes and musical performances from the American Musical Theatre genre (1960-Present) with instruction and critique from a panel of acting, music, and dance faculty. Students will examine, explore and execute acting techniques and styles applicable to the musical through scene and musical performance study and classroom exercises. (May be repeated for a maximum of 6 credit hours.).

THET 460. Contemporary Drama. 3 Hours.
PR: ENGL 102 or ENGL 103. Contemporary drama provides an analysis and exploration of a set of representative living playwrights with research and context. Also, writing and discussion will follow current issues of the periodical American Theatre.

THET 462S. Puppetry. 3 Hours.
Comprehensive study of puppetry as a theatrical form. Construction, manipulation, and production methods for adult and youth audiences are highlighted.

THET 464S. Children's Theatre. 3 Hours.
PR: Consent. Study of theatre for child audiences. Writing, acting, designing, directing and producing plays with detailed analysis of scripts and children as audience members. (Field trip required.).

THET 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

THET 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

THET 492. Directed Study. 1-3 Hours.
PR: Consent. (May be repeated for a maximum of 12 credit hours.) Directed study, reading, and/or research.

THET 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

THET 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

THET 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

THET 496. Senior Thesis. 1-3 Hours.
PR: Consent.

THET 497. Research. 1-6 Hours.
Independent research projects.

THET 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

ULIB 101. Introduction to Library Research. 2 Hours.
Focuses on the concepts and logic of information access including using the libraries' online catalog, various databases and the Internet to find quality information. Incorporates hands-on practice with electronic resources for research and synthesis of information.

ULIB 102. Introduction to Health Sciences Library Research. 2 Hours.
Focuses on the concepts and logic of information access including using the libraries' online catalog, various databases and the Internet to find quality health sciences information. Incorporates hands-on practice with electronic resources for research and synthesis of information. Students produce information products for a variety of audiences.

ULIB 103. Introduction to STEM Library Research. 2 Hours.
Focuses on the concepts and logic of information access including using the libraries' online catalog, various databases, and the Internet to find quality STEM information. Incorporates hands-on practice with electronic resources for research, synthesis, and evaluation of information. Includes discussion of library research and publishing ethics. Students produce information products for a variety of STEM audiences.

ULIB 199. Orientation to College Research. 2 Hours.
Offers knowledge and skills needed to successfully complete undergraduate research projects. Introduces resources for research and evaluation skills, as well as basic project management skills.

ULIB 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

ULIB 300. Film and Media Literacy. 3 Hours.
Introduction to media literacy, film vocabulary, criticism, research databases, conventions, cliches, and characteristics of genre films to guide evaluating and critiquing films. Online course; films on electronic media library reserve.

ULIB 301. Gender and the Research Process. 3 Hours.
This course teaches the research process through the lens of gender. Students decide on a subject, write a research question, develop a working knowledge, search for information, select appropriate sources, and present results.

ULIB 302. Research for Non-Profits. 3 Hours.
The course will develop research skills including precise, effective use of discipline specific databases and grant-seeking resources. Students will apply these skills working in teams to produce a research portfolio for a local non-profit organization.

ULIB 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

USAF 100. Leadership Laboratory. 1 Hour.
Dynamic and integrated grouping of leadership developmental activities designed to meet the needs and expectations of prospective Air Force junior officers and complement the AFROTC academic program. ' Leadership Laboratory' enrollment is restricted to AFROTC cadets.

USAF 131. Foundations of United States Air Force 1. 1 Hour.
Coreq: USAF 100. Survey course designed to introduce students to the United States Air Force. Provides an overview of the basic characteristics, missions, and organization of the Air Force. Includes an overview of AFROTC and AFROTC special programs.

USAF 132. Foundations of United States Air Force 2. 1 Hour.
USAF 132. Foundations of United States Air Force 2. 1 HR. Coreq: USAF 100. Continuation of USAF 131.

USAF 251. Air and Space Power 1. 1 Hour.
PR: Corequisite of USAF 100. Student of USAF heritage and leaders with respect to the evolution and employment of air and space power. Analysis of operational examples will emphasize development and application of competencies, functions, and doctrine.

USAF 252. Air and Space Power 2. 1 Hour.
Continuation of USAF 251.

USAF 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

USAF 371. Leadership Studies 1. 3 Hours.
Coreq: USAF 100. Student of leadership, management, professional knowledge, leadership ethics, and communication skills required of an air force junior officer. Case studies are used as a means of exercising practical application of concepts.

USAF 372. Leadership Studies 2. 3 Hours.
Coreq: USAF 100. Continuation of USAF 371.

USAF 481. National Security/Active Duty 1. 3 Hours.
PR: USAF 100-level classes and USAF 200-level classes or special permission form Aerospace Studies Department. Examines the national security process, regional studies, leadership ethics, and USAF doctrine. Topics include the military as a profession, officership, military justice, civilian control of the military, active duty preparation, and issues affecting military professionalism.

USAF 482. National Security/Active Duty 2. 3 Hours.
PR: USAF 100-level courses and USAF 200-level courses or special permission from Aerospace Studies Department. USAF 131, 132, 251, 252, 371, 372, 481, and 482 may be taken out of sequence if unusual circumstances warrant and the student received approval from the professor of Aerospace Studies.

USAF 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

USAF 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

USAF 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

USAF 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

USAF 496. Senior Thesis. 1-3 Hours.
PR: Consent.

USAF 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

VETS 110L. Introduction to Veterinary Technology. 1 Hour.
This introductory course provides students with hands-on skills to the profession of veterinary technology. The student will cover topics in hospital operation, professional standards and ethics, and overview of the major components of the veterinary technician industry. Introduction to common clinical procedures and animal health care. Lab includes restraint, lab procedures, and administration of medicines.

VETS 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

VETS 302. Animal Pathology. 3 Hours.
PR: ANPH 301 or consent. Diseases of farm animals with special emphasis on their cause, prevention, and control.

VETS 400. Veterinary Medical and Surgical Nursing Care 1. 4 Hours.
PR or CONC: (A&VS 150 and A&VS 251 and VETS 110L) with a minimum grade of C- in all. An in-depth study of animal patient care and surgical nursing focusing on elements of small and large animal surgical nursing, surgical assistance, surgical instrumentation, suture material, aseptic technique, parasitology, blood analysis and chemistry's, pharmacology, anesthesiology, exotics, radiography, and dentistry.

VETS 401. Veterinary Anatomy. 3 Hours.
PR: Junior standing or consent. Functional study of domestic and farm animal anatomy.

VETS 401L. Veterinary Anatomy Laboratory. 1 Hour.
PR or CONC: VETS 401 and Junior standing. Gross dissection techniques used for the study of functional anatomy in domestic animals.

VETS 402. Veterinary Medical and Surgical Nursing Care 2. 4 Hours.
PR or CONC: (A&VS 150 and A&VS 251 and VETS 110L and VETS 400) with a minimum grade of C- in all. The continuation of an in-depth study of animal patient care and surgical nursing focusing on elements of small and large animal surgical nursing, surgical assistance, surgical instrumentation, suture material, aseptic technique, parasitology, blood analysis and chemistry's, pharmacology, anesthesiology, exotics, radiography, and dentistry.

VETS 405. Parasitology. 3 Hours.
PR: (BIOL 101 and BIOL 101L and BIOL 102 and BIOL 102L) or (BIOL 115 and BIOL 115L) and PR or CONC: VETS 405L. Common parasites of farm animals, their life cycles, effects on the host, diagnosis, control, and public health importance.

VETS 405L. Parasitology Laboratory. 1 Hour.
PR or CONC: VETS 405. Parasitology - VETS 405 Laboratory.

VETS 411. Principles of Laboratory Animal Science. 3 Hours.
PR: Consent for undergraduates. The production, genetics, physiology, nutrition, disease and regulations of laboratory animals used in research and teaching. This course meets minimal requirements for laboratory animal technical certification programs of the American Association of Laboratory Animal Science (AALAS).

VETS 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

VETS 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

VETS 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

VETS 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

VETS 496. Senior Thesis. 1-3 Hours.
PR: Consent.

VETS 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

WDSC 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

WDSC 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WDSC 337L. Wood Adhesion and Finishing Laboratory. 0 Hours.
Coreq: WDSC 337. Wood Adhesion and Finishing - WDSC 337 Laboratory.

WDSC 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WDSC 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

WDSC 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

WDSC 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WDSC 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

WDSC 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

WDSC 496. Senior Thesis. 1-3 Hours.
PR: Consent.

WDSC 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

WGST 150. Women in Movies. 3 Hours.
Through viewing popular Hollywood films, we will analyze femininity across the life span. Critical thinking and cultural analysis will be practiced as we study heroines, working girls, motherhood, brides, cheerleaders, and old women on screen.

WGST 170. Introduction to Women's and Gender Studies. 3 Hours.
The major contexts in which gender identities have been and are defined and of the relationships between these definitions and the roles and history of women and men in society and culture.

WGST 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

WGST 200. Feminist Histories and Practices. 3 Hours.
Definitions, implications and origins of feminism. Explores various histories and forms of feminist organizing, how intersectionality shapes/changes feminism, how global/historical/political locations inform feminism, and how feminist efforts to create change have included critically engaging with the politics of knowledge production.

WGST 215. African Women Writers. 3 Hours.
Selected works by African women writers. (Also listed as FLIT 215.).

WGST 220. Medieval Women Mystics. 3 Hours.
History, writings, and impact of mystics, including but not limited to, Hildegard of Bingen, Saint Clare of Assisi, Julian of Norwich, Saint Catherine of Siena, Saint Catherine of Genoa, and Saint Teresa of Avila.

WGST 225. Women in Appalachia. 3 Hours.
Use variety of sources to explore how race, class, ethnicity, sex and gender impact lives of diverse Appalachian women, including portrayal of women, stereotypes, impact of stereotypes, and how women construct their own identities.

WGST 242. Women's Health and Fitness. 3 Hours.
In this applied class, students will be actively learning about college-age women's health and participating in fitness activities, as well as creating a personal plan to improve one's health.

WGST 250. Women in Science. 3 Hours.
History of women in science and methods of gender analysis applied to issues facing women in science in the United States.

WGST 260. Perspectives on Lesbian, Gay, Bisexual, Transgender, and Queer Studies. 3 Hours.
Overview of lesbian, gay, bisexual, transgender, and queer studies. Examines the construction of gender, biological sex, sexual orientation, and gender identity, expression and performance related to lesbian, gay, bisexual, transgender, queer, questioning, intersex, asexual, pansexual, and two-spirit identities. Also examines intersections with race, ethnicity, class, nation, culture, ability, and religion.

WGST 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WGST 300. Methods for Inclusive Research. 3 Hours.
Basic and applied research concepts and methods that are essential for professionals whose work involves translational research (i.e., applied) and/or action research (i.e., involving communities who use the research). Assists students in becoming reflective evidence-based decision-makers.

WGST 330. Feminist Theory. 3 Hours.
PR or CONC: WGST 200 or WGST 260 with a minimum grade of C-. Explores current feminist theory through works by diverse scholars, focusing on questions of essentialism, difference, sexuality, bodies, language, power, economic and ecological justice, intersections of race, class and gender, and global social justice struggles.

WGST 340. Gender and Violence. 3 Hours.
Gender violence has implications for all members of society. This course will examine violence in the lives of women across the lifespan. Etiology, theories, effects, and prevention modalities will be evaluated.

WGST 345. Women in International Development. 3 Hours.
Examines cultural diversities in the definition of women's roles and status; investigates women's access to education, health, income, credit and technology; and studies women's contributions in third world development.

WGST 360. Queer Theories. 3 Hours.
PR or CONC: WGST 200 or WGST 260 with a minimum grade of C-. Provides a framework for understanding the history and contemporary applications of queer theories and interdisciplinary LGBTQ studies. Explores the relationship of queer theories to feminist theories through examining works by diverse scholars, focusing on questions of identities, bodies, policies, institutions, and popular and visual cultures.

WGST 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WGST 448. Sexuality in American Culture. 3 Hours.
Explores changes in sexuality in the United States from the seventeenth century to the present, examining social and cultural struggles and debates over the meaning of sexuality and sexual orientation in American society.

WGST 449. Women's Movements Since 1960. 3 Hours.
Comparison of U.S. "Second wave" and "Third Wave" feminisms; validity of the concepts of "waves" of feminism; and impact of race, class, sexual orientation, on perspectives on women's status.

WGST 450. Sex and Science at the Movies. 3 Hours.
Explores how bodies, sexuality, and other gendered traits are used in films to demonstrate techno-science's societal impacts. Examines the relationship between media representations and techno-scientific practice.

WGST 460. Men and Masculinities. 3 Hours.
PR: WGST 170 or WGST 260. An advanced seminar in women's and gender studies that critically examines the concept of masculinity and its impact on men's and women's lives. Analyzes masculinities from cultural, historical, biological, philosophical, sociological, psychological, economic, and political perspectives.

WGST 484. Seminar:Capstone. 3 Hours.
PR: Consent. Required of all women's studies students. Students will broaden their theoretical definitions of feminism and women's studies to include non-western models and solutions, pairing this study with a local service project informed by global activists.

WGST 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

WGST 491. Independent Study. 1-18 Hours.
Faculty supervised study of topics not available through regular course offerings.

WGST 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WGST 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

WGST 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

WGST 496. Senior Thesis. 1-3 Hours.
PR: Consent.

WGST 498. Honors. 1-3 Hours.
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.

WMAN 100. The Tradition of Hunting. 3 Hours.
Introduction to the cultural and spiritual role of hunting; use of hunting as a wildlife management tool; and its economic value in wildlife conservation programs. Includes discussions on gun control, anti-hunting, and animal rights.

WMAN 150. Principles of Conservation Ecology. 3 Hours.
Overview of the science of conservation ecology with emphasis on the concepts of biological diversity, extension, habitat loss and fragmentation, establishment of protected areas, endangered species, and establishment and preservation of new populations.

WMAN 160. Ecology of Invading Species. 3 Hours.
Survey of invasive/exotic plant and animal species and their effects on native ecosystems, including the breakdown of natural barriers to invasion by the increase of world commerce which unifies widely dispersed resources.

WMAN 175. Introduction to Wildlife and Fisheries. 3 Hours.
PR: Corequisite of WMAN 175L. Introduction to the study and management of wildlife and fisheries resources of the Appalachians. Includes an overview of resource management history, career opportunities, natural resources policy, and the basic life of birds, mammals, and fishes.

WMAN 175L. Introduction to Wildlife and Fisheries Laboratory. 0 Hours.
PR: Corequisite of WMAN 175. Introduction to Wildlife and Fisheries - WMAN 175 Laboratory.

WMAN 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

WMAN 200. Restoration Ecology. 3 Hours.
Principles and practice of restoring natural ecosystem function, structure, and integrity.

WMAN 205. Wildlife Summer Field Camp. 3 Hours.
This is a field-intensive, orientation course in field ecology and wildlife techniques. It is designed to immerse the beginning wildlife professional to the art and science of collecting data on wildlife and their habitats. Knowledge of animal-habitat relations and field techniques is critical to management of these resources.

WMAN 206. Fisheries Summer Field Camp. 3 Hours.
A course in field ecology and fisheries sampling techniques. Designed to introduce the beginning fisheries conservation professional to the science of collecting data on aquatic habitat, organisms, and fish populations in their natural habitats.

WMAN 207. International Conservation. 3 Hours.
PR or CONC: WMAN 150. This course enables students to participate in Education Abroad opportunities in other countries to conduct biodiversity research and learn about conservation issues facing that country. Students will be visiting a diverse range of ecosystems, conducting fish or wildlife research, and participating in several naturalist-led hikes. The selected place of travel may vary with each course offering.

WMAN 224. Vertebrate Natural History. 3 Hours.
PR: BIOL 102 and (BIOL 102L or BIOL 104) or BIOL 117 or consent and Coreq: WMAN 224L. Relationships of fish, amphibians, and reptiles to the forest, with emphasis on the ecology, taxonomy, evolution, natural history, and field identification of these groups. Laboratory emphasizes natural history and anatomy of fish, amphibians, and reptiles.

WMAN 224L. Vertebrate Natural History Laboratory. 0 Hours.
PR: Corequisite of WMAN 224. Vertebrate Natural History - WMAN 224 Laboratory.

WMAN 250. Big Game Ecology and Management. 3 Hours.
Intensive field trip and online material emphasizing white tailed deer and black bear ecology with additional material on western game species and exotics.

WMAN 260. Waterfowl Ecology. 3 Hours.
Intensive field-trip and on-line material emphasizing the ecology of waterfowl and management of wetland habitats.

WMAN 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WMAN 298. Honors. 1-3 Hours.
PR: Students in the Honors Program and consent by the honors director. Independent reading, study or research.

WMAN 300. Wildlife and Fisheries Techniques. 4 Hours.
PR: (CS 101 or FOR 240) and STAT 211 and PR or CONC: RESM 440 with a minimum grade of C- in each and Coreq: WMAN 300L. Field and laboratory techniques for the scientific management and evaluation of wildlife and fisheries resources.

WMAN 300L. Wildlife and Fisheries Techniques Laboratory. 0 Hours.
PR: Corequisite of WMAN 300. Wildlife and Fisheries Techniques - WMAN 300 Laboratory.

WMAN 311. Silvicultural Applications for Wildlife. 4 Hours.
PR: FNRS 205 and FNRS 205L with a minimum grade of C-. Silvicultural concepts and applications with an emphasis on wildlife habitat management. Topics will include: site quality assessment, forest sampling, tree and stand growth and development, silvicultural treatments and regeneration systems. Field exercises will focus on practical application of silvicultural concepts.

WMAN 311L. Silvicultural Appl Wildlife Laboratory. 0 Hours.
PR: FNRS 205 and FNRS 205L with a minimum grade of C- in each and Coreq: WMAN 311. Silvicultural Applications for Wildlife - WMAN 311 Laboratory.

WMAN 313. Wildlife Ecosystem Ecology. 4 Hours.
PR: ((BIOL 101 and BIOL 101L and BIOL 102 and BIOL 102L) or (BIOL 115 and BIOL 117)) and (MATH 124 or higher) and Coreq: WMAN 313L. Basic principles of ecosystem, community, and population ecology. Emphasizing structure, function, succession, physiological ecology, population growth and regulation, and systems modeling.

WMAN 313L. Wildlife Ecosystem Ecology Laboratory. 0 Hours.
PR: Corequisite of WMAN 313. Wildlife Ecosystem Ecology - WMAN 313 Laboratory.

WMAN 314. Marine Ecology. 3 Hours.
Study of key coastal species and their interactions. Self-paced lectures and exercises culminating with one-week capstone trip to Atlantic coast for hands-on study of invertebrates, coastal fishes and birds, and marine ecology.

WMAN 330. Conservation Genetics. 3 Hours.
PR: BIOL 101 and BIOL 102 or equivalent or higher and MATH 124 or higher. Introduction to the principles of modern genetics needed to understand and manage important challenges in conservation of biodiversity including game, non-game, and endangered/threatened species. Also listed as GEN 330.

WMAN 393. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WMAN 411. Introduction to Quantitative Ecology. 3 Hours.
PR: STAT 211 with a minimum grade of C-. Introduction to quantitative techniques unique to the analysis of fish and wildlife data.

WMAN 425. Mammalogy. 4 Hours.
PR: WMAN 224 with a minimum grade of C-. Mammals and their biological properties with emphasis on life history, ecology, and distribution of regional forms.

WMAN 425L. Mammalogy Laboratory. 0 Hours.
PR: WMAN 224 with a minimum grade of C- and Coreq: WMAN 425. Mammalogy - WMAN 425 Laboratory.

WMAN 426. Ornithology. 3 Hours.
PR: WMAN 224 and Coreq: WMAN 426L. Identification, distribution, and ecology of birds (particularly of forest lands.).

WMAN 426L. Ornithology Laboratory. 0 Hours.
PR: Corequisite of WMAN 426. Ornithology - WMAN 426 Laboratory.

WMAN 427. Herpetology. 3 Hours.
PR: WMAN 224 with a minimum grade of C-. Identification, biology, ecology, and conservation of reptiles and amphibians, with emphasis on species found in the state of West Virginia.

WMAN 445. Fisheries Management. 4 Hours.
PR: Corequisite of WMAN 445L. Basic principles of management of fishery resources, with an emphasis on freshwater stocks. Includes current environmental and management issues, concepts, and methods used in management of fisheries.

WMAN 445L. Introduction to Fisheries Management Laboratory. 0 Hours.
PR: Corequisite of WMAN 445. Introduction to Fisheries Management - WMAN 445 Laboratory.

WMAN 446. Freshwater Ecology. 4 Hours.
PR: (BIOL 101 and BIOL 102 and BIOL 103 and BIOL 104) or BIOL 115 or WMAN 224 or consent and Coreq: WMAN 446L. Physical, chemical, and biological characteristics of inland waters with emphasis on the structure and function of stream ecosystems.

WMAN 446L. Freshwater Ecology Laboratory. 0 Hours.
PR: Corequisite of WMAN 446. Freshwater Ecology - WMAN 446 Laboratory.

WMAN 450. Advanced Wildlife and Fisheries Management. 4 Hours.
PR: WMAN 300 and Coreq: WMAN 450L. Principles and practices of wildlife and fisheries habitat and species management.

WMAN 450L. Advanced Wildlife and Fisheries Management Laboratory. 0 Hours.
PR: Corequisite of WMAN 450. Advanced Wildlife and Fisheries Management - WMAN 450 Laboratory.

WMAN 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

WMAN 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

WMAN 492. Directed Study. 1-3 Hours.
Directed study, reading and/or research.

WMAN 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WMAN 494. Seminar. 1-3 Hours.
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

WMAN 495. Independent Study. 1-6 Hours.
Faculty supervised study of topics not available through regular course offerings.

WMAN 496. Senior Thesis. 1-3 Hours.
PR: Consent.

WMAN 498. Honors. 1-3 Hours.
PR: Students in the Honors Program and consent by the honors director. Independent reading, study or research.

WRIT 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

WRIT 201. Public Writing. 3 Hours.
PR: (ENGL 101 and ENGL 102) or ENGL 103 with a minimum grade of C-. Focus on writing that informs or persuades a public audience. It asks writers to identify a problem in the community, thoroughly research the problem, determine the best plan for addressing the problem, and present the plan to agents of change in the community. Writers will develop well-supported arguments in a variety of ways.

WRIT 202. Introduction to Writing Studies. 3 Hours.
PR: ENGL 101 or ENGL 103 with a minimum grade of C-. Gateway course for both the BA in Professional Writing and Editing and the BS in Scientific and Technical Writing. Introduces writing as a field of study and allows students to explore the major.

WRIT 301. Writing Theory and Practice. 3 Hours.
PR: (ENGL 101 and ENGL 102) or ENGL 103. Traditional and contemporary approaches to rhetoric and writing theory for professional writing and editing students who wish to develop their abilities to analyze and produce written texts.

WRIT 302. Editing. 3 Hours.
A comprehensive approach to editing, including the correctness and effectiveness of a document, information design, and editorial responsibility. Students gain a realistic perspective on workplace practice through real-world scenarios, case studies, and technological applications.

WRIT 303. Multimedia Writing. 3 Hours.
Study of communication and design issues in multimedia composition. Focuses on communication, creative expression, persuasion, interactivity, and rhetorical principles. Practice in composing multimedia documents such as online publications, interactive literary works, and tutorials.

WRIT 304. Business and Professional Writing. 3 Hours.
PR: (ENGL 101 and ENGL 102) or ENGL 103. Students will analyze different writing contexts, meet the needs of different audiences, and organize and present material in letters, memos, and reports. Includes some research, Internet components, and a review of style, grammar and usage.

WRIT 305. Technical Writing. 3 Hours.
PR: (ENGL 101 and ENGL 102) or ENGL 103. Writing in scientific and technical fields. Introduces students to typical genres, workplace practices, document design, and conventions of writing for experts and non-experts.

WRIT 306. Topics in Digital Humanities. 3 Hours.
PR: WVU sections require (ENGL 101 and ENGL 102) or ENGL 103 with a minimum grade of C- in all, PSC and WVUIT sections require (ENGL 101 and ENGL 102). Introduces the digital humanities as a community of practice, a growing interdisciplinary field, and a set of approaches to research and teaching. Topics may include critical code studies, technology in the classroom, digital editions, text and network analysis, machine learning, and data visualization. Designed for students who are “tech-curious” but not yet experienced with coding or working with data.

WRIT 402. Publishing. 3 Hours.
PR: ENGL 101 and 102 (or ENGL 103) with a minimum grade of C-. The history, theory, and practice of publishing as well as the design and layout of documents in print and digital forms according to the needs of a specific audience.

WRIT 403. Grant Proposal Writing for Community & Industry. 3 Hours.
PR: (ENGL 102 or ENGL 103) with a minimum grade of C-. Introduction to activities, responsibilities, challenges, and opportunities that characterize proposals for communities, nonprofits, or research/industry. Students will learn components of the process, including how to identify appropriate funding streams, develop fundable themes, write a specific work plan and budget, and understand the grant review process. Coursework will involve readings, individual proposal analyses, and collaborative proposal writing.

WRIT 407. The Writing of Health and Medicine. 3 Hours.
PR: (ENGL 101 and ENGL 102) or ENGL 103 with a minimum grade of C- in each. Explores genres important to health and medicine. Students read, analyze, and write texts in these genres-considering their audiences, purposes, and conventions as well as the role specific texts play in shaping the practices and experiences of health and medicine.

WRIT 408. Rhetoric and Science. 3 Hours.
PR: (ENGL 101 and ENGL 102) or ENGL 103. Explores the relationship between rhetoric and science. Students will analyze the audiences, purposes, and conventions of scientific arguments as well as the role of specific texts in shaping scientific disciplines and debates. No background in science is required.

WRIT 450. Intro to Forensic Linguistics. 3 Hours.
Introduces students to the analysis of language for legal purposes and provides them first-hand experience in forensic linguistics. The course focuses on the application of linguistic theory, research, and procedures to issues of the law. In their final project, students review forensic linguistic case studies.

WRIT 460. Appalachian Englishes. 3 Hours.
PR: (ENGL 102 or ENGL 103) with a minimum grade of C-. An introduction for methods and topics in the study of the linguistic, historical, and social patterns of English language varieties in Appalachia through the examination of modern research and the analysis of public perceptions.

WRIT 480. Capstone Internship. 3 Hours.
PR: WRIT 202 and WRIT 301 and WRIT 302 and (WRIT 304 or WRIT 305) with a minimum grade of C- in all. Focuses practical on-the-job experience as writers within a professional organization as they apply the knowledge and skills they have developed in the major. Students also participate in a weekly seminar to discuss theories of workplace writing, ethical issues, and professionalism.

WRIT 490. Teaching Practicum. 1-3 Hours.
PR: Consent. Teaching practice as a tutor or assistant.

WRIT 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

WVUE 188. Adventure West Virginia. 1 Hour.
This course is for incoming WVU students who completed and Adventure WV First Year Trip during the summer prior to their first semester at WVU. The course serves as a complement to the student's first year experience at WVU; it encourages reflection, goal setting, and involvement in the WVU community.

WVUE 189. Academic Mindset. 1 Hour.
The course will introduce students to a mindset that will assist them in acquiring knowledge and developing skills associated with achieving academic and personal success.

WVUE 191. First Year Seminar. 1-3 Hours.
Exploration of academic experiences through meaningful contexts. The course will envelope a range of academic components needed to achieve student success and successfully transition to West Virginia University.

WVUE 192. First Year Experience: Athletes. 1 Hour.
Exploring academic experiences through meaningful contexts for Student Athletes. The course will cover a range of academic components needed to achieve academic success and provide the opportunities necessary for a successful transition to West Virginia University.

WVUE 200. RiseWVU University Mentoring. 1 Hour.
This course encourages campus and community connections for undergraduate students through mentoring from WVU faculty and staff members to further assist with the continued transition to college.

WVUE 270. Effective Public Speaking. 3 Hours.
Designed for improvement of the student's speech based upon theory and demonstrated performance of voice and diction skills and public-speaking skills for effective communication in a variety of speaking situations.

WVUE 280. Presidential Student Ambassadors: Leading & Serving. 3 Hours.
PR: Consent. In addition to developing and presenting four major public speaking assignments, students fulfill Student Engagement & Leadership requirements of 20 leadership events and 40 service hours to become Certified Student Leaders.

WVUE 281. Presidential Student Ambassadors: Speakers Bureau. 1 Hour.
PR: WVUE 280 with a minimum grade of B-. Students who have completed WVUE 280 (Presidential Student Ambassadors: Leading & Serving) will enroll in Speakers Bureau the following semester. They will speak to eight external audiences (e.g., prospective and current WVU students and/or their families, WVU/State audiences, etc.) about university-related topics. The professor will assign four events; students will be responsible for scheduling additional audiences, pre-approved by the Professor.

WVUE 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WVUE 425. College to Career. 3 Hours.
PR: Must be at least a Junior in academic standing. This course is designed to help students make the transition from college to career in a successful manner. The course focuses on six specific needs that employers often refer to as soft skills: Communications, Critical Thinking, Leadership, Positive Attitude, Team Work, and Work Ethic.

WVUE 491. Professional Field Experience. 1-18 Hours.
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

WVUE 493. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

WVUE 495. Independent Study. 1-6 Hours.
Faculty-supervised study of topics not available through regular course offerings.