Engineering Technology, B.S.

Degree Offered

- Bachelor of Science in Engineering Technology (B.S.)

Nature of the Program

This general Engineering Technology program provides graduates with instruction in technical and leadership skills necessary for manufacturing and industrial competitiveness and to enter careers in manufacturing process and systems design, operations, quality, continuous improvement, lean manufacturing and sustainability. It prepares graduates with knowledge, problem-solving ability and hands-on skills and to enter careers related to preparation of engineering drawings, design, installation, manufacturing, testing, technical sales, maintenance, improvement of integrated processes, their resulting products (including mechanical components and complex systems) and services within an organization. It draws upon specialized knowledge and skill in the mathematical, natural, physical and social sciences together with the principles and methods of engineering analysis and design, to design and fabricate products and specify, predict and evaluate the results to be obtained from integrated processes and systems. The B.S. Engineering Technology degree curriculum provides a multi-disciplinary overview of engineering technology with a general focus on manufacturing and requires the completion of two Areas of Emphasis.

Program Educational Objectives

It is expected that, within a few years of graduation, graduates will attain the following Program Educational Objectives (PEOs):

- PEO-1. Graduates will be engaged in their professional careers, have consolidated professional proficiency as practitioners in an area of engineering technology as reflected by their responsibilities and accomplishments of their professional practice, and engage in lifelong learning and service opportunities.
- PEO-2. Graduates will be able to work competitively and collaboratively in diverse professional environments as demonstrated by their abilities to work on teams and independently, to provide leadership, and to communicate effectively to a variety of audiences.
- PEO-3. Graduates will behave professionally and ethically, be committed to responsible safety practices, and be aware of the significance and the societal impact of their work.

FACULTY

TEACHING ASSISTANT PROFESSOR

- Emily Spayde - Ph.D. (Mississippi State University)
- Sehtab Hossain - Ph.D. (University of Missouri Kansas City)

ADJUNCT TEACHING PROFESSOR

- Todd Hamrick - Ph.D. (West Virginia University)
- Robin A. M. Hensel - Ed.D (West Virginia University)

ADJUNCT TEACHING ASSOCIATE PROFESSOR

- Mohamed Hefeida - Ph.D. (University of Illinois-Chicago)

LABORATORY COORDINATOR

- Kelsey Crawford - B.S. (West Virginia University)

Degree Requirements

Students must meet the following criteria to qualify for a Bachelor of Science in Engineering Technology degree:

- Complete a minimum of 120 credit hours
- Satisfy WVU's undergraduate degree requirements
- Satisfy Statler College's undergraduate degree requirements
- Complete all courses listed in the curriculum requirements with the required minimum grades
- Attain an overall grade point average of 2.00 or better
- Attain a WVU grade point average of 2.00 or better
- Attain a Statler grade point average of 2.00 or better
- A maximum of one math or science courses with a grade of D+, D, or D- may apply towards a Statler College degree

- Complete a survey regarding their academic and professional experiences at WVU, as well as post-graduation job placement or continuing education plans.

The Statler GPA is computed based on all work taken at WVU with a subject code within Statler College (BIOM, BMEG, CE, CHE, CPE, CS, CSEE, CYBE, EE, ENGR, ENVE, ETEC, IENG, IH&S, MAE, MINE, PDA, PNGE, SAFM, SENG) excluding ENGR 140, ENGR 150, and CS 101. The WVU GPA is computed based on all work taken at WVU. The Overall GPA is computed based on all work taken at WVU and transfer work.

Curriculum Requirements

Code	Title	Hours
University Requirements		25
Fundamentals of Engineering Requirements		5
Math and Science Requirements		21
Engineering Technology Program Requirements		69
Total Hours		120

University Requirements

Code	Title	Hours
General Education Foundations (GEF) 1, 2, 3, 4, 5, 6, 7, and 8 (31-37 Credits)		
Outstanding GEF Requirements 1, 4, 6, 7		15
ENGR 191	First-Year Seminar	1
General Electives		9
Total Hours		25

Fundamentals of Engineering Requirements

Code	Title	Hours
A minimum grade of C- is required in all Fundamentals of Engineering courses.		
ENGR 101	Engineering Problem Solving 1	2
Engineering Problem Solving (Select one of the following):		3
CHE 102	Introduction to Chemical Engineering	
CS 110 & 110L	Introduction to Computer Science and Introduction to Computer Science Laboratory	
ENGR 102	Engineering Problem Solving 2	
ENGR 103	Introduction to Nanotechnology Design	
MAE 102	Introduction to Mechanical and Aerospace Engineering Design	
Total Hours		5

Math and Science Requirements

Code	Title	Hours
A minimum grade of C- is required in all Math and Science courses.		
Chemistry		4
CHEM 111 & 111L	Survey of General, Organic, and Biological Chemistry 1 and Survey of Chemistry 1 Laboratory	
CHEM 115 & 115L	Fundamentals of Chemistry 1 and Fundamentals of Chemistry 1 Laboratory	
Calculus 1 (GEF 3):		3
MATH 150	Applied Calculus	
MATH 155	Calculus 1	
Calculus 2		3
MATH 151	Applied Calculus 2	
MATH 156	Calculus 2	
Physics 1		4
PHYS 101 & 101L	Introductory Physics 1 and Introductory Physics 1 Laboratory	

PHYS 111 & 111L	General Physics 1 and General Physics 1 Laboratory	
Physics 2		4
PHYS 102 & 102L	Introductory Physics 2 and Introductory Physics 2 Laboratory	
PHYS 112 & 112L	General Physics 2 and General Physics 2 Laboratory	
Statistics		3
STAT 211	Elementary Statistical Inference	
STAT 215	Introduction to Probability and Statistics	
Total Hours		21

Engineering Technology Program Requirements

Code	Title	Hours
Computer Applications		2
BCOR 121	Introduction to Business Applications	
CS 101	Intro to Computer Applications	
WRIT 305	Technical Writing	3
ENGR 140	Engineering in History (also meets GEF 5)	3
ETEC 199	Introduction to Engineering Technology	1
ETEC 130 & 130L	Manufacturing Processes 1 and Manufacturing Processes 1 Laboratory	3
ETEC 210 & 210L	Engineering Graphics and Descriptive Geometry and Engineering Graphics and Descriptive Geometry Laboratory	3
ETEC 220 & 220L	Applications of Technology and Applications of Technology Laboratory	3
ETEC 310 & 310L	Material Science with Applications and Material Science with Applications Laboratory	3
ETEC 330 & 330L	Manufacturing Processes 2 and Manufacturing Processes 2 Laboratory	3
ETEC 340 & 340L	Electronic Circuits and Electronic Circuits Laboratory	4
or EE 221 & 221L	Introduction to Electrical Engineering and Introduction to Electrical Engineering Laboratory	
ETEC 350	Analysis for Engineering Technology	3
ETEC 401	Science, Technology, & Society	2
ETEC 440 & 440L	Industrial Automation PLC 1 and Industrial Automation PLC 1 Laboratory	3
ETEC 475S	Engineering Technology Capstone Experience	3
IENG 377	Engineering Economy	3
IENG 445	Project Management for Engineers	3
Area of Emphasis 1		12
Area of Emphasis 2 *		12
Total Hours		69

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Three credits in one of the Areas of Emphasis must be replaced with either ETEC 370, ETEC 450, or ETEC 491.

Plan of Study

First Year

Fall	Hours	Spring	Hours
ENGL 101 (or GEF 4)	3	BCOR 121	2
ENGR 191	1	ENGL 101 (or GEF 4)	3

ETEC 199	1	ETEC 210 & 210L	3
ETEC 130 & 130L	3	MATH 151	3
MATH 150	3	PHYS 102 & 102L	4
PHYS 101 & 101L	4		
	15		15

Second Year

Fall	Hours	Spring	Hours
CHEM 111 & 111L	4	ENGL 102	3
ENGR 101	2	ENGR 102	3
ENGR 140	3	ETEC 310 & 310L	3
ETEC 220 & 220L	3	AoE 1 Elective (#1)	3
STAT 211	3	AoE 2 Elective (#1)	3
	15		15

Third Year

Fall	Hours	Spring	Hours
ETEC 330 & 330L	3	WRIT 305	3
ETEC 340 & 340L	4	ETEC 370 (Applied Workshop (#2))	1
ETEC 350	3	ETEC 440 & 440L	3
ETEC 370 (Applied Workshop (#1))	1	IENG 377	3
AoE 1 Elective (#2)	3	AoE 2 Elective (#2)	3
		GEF 6	3
	14		16

Fourth Year

Fall	Hours	Spring	Hours
ETEC 401	2	ETEC 475S	3
ETEC 370 (Applied Workshop (#3))	1	IENG 445	3
AoE 1 Elective (#3)	3	AoE 1 Elective (#4)	3
AoE 2 Elective (#3)	3	General Elective	3
General Elective	3	GEF 7	3
General Elective	3		
	15		15

Total credit hours: 120

Areas of Emphasis

- Construction Management
- Energy Technology
- Engineering Management and Entrepreneurship
- Industrial Engineering Technology
- Mechanical Engineering Technology
- Multi-Disciplinary Engineering Technology

Construction Management Area of Emphasis

Code	Title	Hours
A minimum grade of C- is required in each course.		
Select twelve (12) credits from the following:		12
CE 413	Construction Scheduling	
CE 414	Construction Engineering	
CE 417	Infrastructure Asset Management 1	
CE 418	Construction Estimating	
Total Hours		12

Energy Technology Area of Emphasis

Code	Title	Hours
A minimum grade of C- is required in each course.		
Select 12 credit hours from the following:		12
ARE 445	Energy Economics	
DSGN 280	Sustainable Design and Development *	
DSGN 340	Design for Energy Efficiency	
DSGN 470	Leadership in Energy and Environmental Design Green Building Systems	
ENGR 310	Energy Engineering	
ENLM 200	Principles of Environmental, Energy, and Land Management *	
ENLM 220	Energy Production & Operations *	
ENLM 250	Managing Non-Technical Risks *	
ENLM 300	Ethics and Negotiations for Land Managers	
ENLM 415	Midstream Energy Planning and Development	
ENLM 442	GIS Skills for Energy Land Management	
IENG 433	Energy Efficiency and Sustainability	
MAE 320	Thermodynamics	
or ETEC 320	Thermodynamics for Engineering Technology	
RESM 405L	Drones in Resource Management	
RESM 440 & 440L	Foundations of Applied Geographic Information Systems and Foundations of Applied Geographic Information Systems Laboratory	
RESM 460	Energy Project and Program Management	
Any 200- or 300- or 400-level Chemical Engineering (CHE), Civil Engineering (CE), Mining Engineering (MINE), or Petroleum and Natural Gas Engineering (PNGE) courses		
Total Hours		12

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A maximum of 3 credit hours may be selected at the 200-level.

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If this is the second Area of Emphasis selected, three credits will be replaced with one of the following courses:

- ETEC 370
- ETEC 450
- ETEC 491

Engineering Management and Entrepreneurship Area of Emphasis

Code	Title	Hours
A minimum grade of C- is required in each course.		
Select 12 credit hours from the following:		12
BCOR 320	Legal Environment of Business	
BCOR 330	Information Systems and Technology	
BCOR 340	Principles of Finance	
BCOR 350	Principles of Marketing	

BCOR 360	Supply Chain Management
BCOR 370	Principles of Management
BCOR 380	Business Ethics
COMM 404	Persuasion
or COMM 335	Social Media in the Workplace
ENGR 450	Technology Entrepreneurship and Enterprise Development
ENTR 400	Advanced Concepts in Entrepreneurship
ENTR 405	Entrepreneurial Creativity & Innovation
ENTR 420	Entrepreneurial Finance
ENTR 436	Family Business
ENTR 440	Small Business Consulting
ENTR 460	Entrepreneurship Practicum
HRMG 470	Conflict Management
IENG 474	Technology Entrepreneurship
Total Hours	12

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A maximum of 3 credit hours may be selected at the 200-level.

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- ETEC 370
- ETEC 450
- ETEC 491

Industrial Engineering Technology Area of Emphasis

Code	Title	Hours
A minimum grade of C- is required in each course.		
Select 12 credit hours from the following:		12
COMM 306	Organizational Communication	
DSGN 270	Product Design Foundations *	
GSCM 450	Supply Chain Quality Management	
IENG 220	Re-Engineering Management Systems *	
IENG 331	Computer Applications in Industrial Engineering	
IENG 461	System Safety Engineering	
IENG 473	Team Facilitation	
SAFM 470	Managing Construction Safety	
SAFM 471	Motor Fleet Safety	
Any 200- or 300- or 400-level Industrial Engineering course (except for IENG 377 and IENG 445)		
Total Hours		12

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A maximum of 3 credit hours may be selected at the 200-level.

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- ETEC 370
- ETEC 450
- ETEC 491

Mechanical Engineering Technology Area of Emphasis

Code	Title	Hours
A minimum grade of C- is required in each course.		
Select 12 credit hours from the following:		12
AGEE 303	Small Engines and Hydraulics	
FNRS 333	Wood Machining	

FNRS 337 & 337L	Wood Adhesion and Finishing and Wood Adhesion and Finishing Laboratory
FNRS 341 & 341L	Wood Mechanics and Wood Mechanics Laboratory
MAE 211	Mechatronics *
MAE 241	Statics *
MAE 459	Hybrid Electric Vehicle Propulsion and Control
Any 300- or 400-level MAE course (except for MAE 312)	
Total Hours	12

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A maximum of 3 credit hours may be selected at the 200-level.

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- ETEC 370
- ETEC 450
- ETEC 491

Multi-Disciplinary Engineering Technology Area of Emphasis

Students work with their assigned Academic Advisor to create a proposed AoE course plan designed to meet the student's stated career goals or interests.

Code	Title	Hours
A minimum grade of C- is required in each course.		
Select 12 credits from the following: *		**12**
Select any courses from Energy Technology Area of Emphasis		
Select any courses from Industrial Engineering Technology Area of Emphasis		
Select any courses from Mechanical Engineering Technology Area of Emphasis		
Any 200- or 300- or 400- level Statler College Course (except IENG 377, IENG 445, and MAE 312)		
Total Hours		12

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Only 3 credits may be selected at the 200-level.

Major Learning Outcomes

ENGINEERING TECHNOLOGY

Upon graduation, all Bachelor of Science students in Engineering Technology will have an ability to:

1. apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline;
2. design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline;
3. apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;
4. conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes; and
5. function effectively as a member as well as a leader on technical teams.