ENGINEERING, B.S.E.

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The Program Educational Objectives of the Bachelor of Science in Engineering (B.S.E.) program are that within a few years of graduation program graduates will:

1. Obtain employment, or an advanced educational opportunity, that utilizes their critical thinking and technical skills.
2. Continue the development of their communication, collaboration, and technical skills, including an understanding of the expectations, standards, and responsibilities associated with their profession.
3. Practice their profession for the benefit of society with attention to ethical, societal, environmental, safety, health, and constructability considerations.

The student outcomes of the B.S.E. are:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Admission Requirements

- Meet Marshall University admission requirements
- Admission to the B.S.E. Engineering program requires a minimum composite ACT score of 21 with a math score of 24, or a minimum SAT composite of 1060 with a math SAT of 570.
- Transfer students must have completed MTH 127 College Algebra-Expanded/MTH 130 College Algebra and MTH 132 Precalculus with Sci Applica.

For those needing to complete some requirements first, there is Pre-Engineering. Requirements for Pre-Engineering are a minimum composite ACT score of 19 with a math score of 19-23, or a minimum SAT composite of 990 with a math SAT of 510-560. Students who are admitted to the Pre-Engineering program generally will require an additional calendar year to complete the requirements for the B.S.E. degree. Transfer students must be eligible to take MTH 127 College Algebra-Expanded/MTH 130 College Algebra and MTH 132 Precalculus with Sci Applica.

Graduation Requirements

The B.S.E. degree program requires a minimum of 124 credit hours of coursework as outlined below. In addition to fulfilling the university's requirements for graduation, B.S.E. students must maintain a minimum GPA of 2.0 in all professional courses. These professional courses include mathematics (MTH 229 Calculus/Analytic Geom I (CT) or above), required science courses, core engineering (ENGR) courses, engineering emphasis courses (CE), and courses used as technical electives. Entering students with a math ACT of 24-26 are required to take MTH 132 Precalculus with Sci Applica. Such students will likely need an extra semester or summer term to satisfy BSE requirements.

Course Requirements

- General Education Course

- Milestone course: a key success marker for your major. See your advisor to discuss the importance of this course in your plan of study.

The Core Curriculum is designed to foster critical thinking skills and introduce students to basic domains of thinking that transcend disciplines. The Core applies to all majors. Information on specific classes in the Core can be found at https://www.marshall.edu/gened/.

Code	Title	Credit Hours
Core 1: Critical Thinking		
FYS 100	First Yr Sem Critical Thinking	3
MTH 229	Calculus/Analytic Geom I (CT)	5
SFT 235	Intro to Occup Safety (CT)	3
Core 2		
ENG 101	Beginning Composition	3
ENG 201	Advanced Composition	3
CMM 103	Fund Speech-Communication	3
MTH 229	Calculus/Analytic Geom I (CT)	5
CHM 211	Principles of Chemistry I	3
CHM 217	Principles of Chem Lab I	2
Core II Humanities		
Core II Social Science		
Core II Fine Arts		
Additional University Requirements		
ENGR 451	Intro to Proj Management	3
ENGR 473	Capstone Senior Design (Writing Intensive)	3
SFT 235	Intro to Occup Safety (CT) (Multicultural or International)	3
ENGR 473	Capstone Senior Design (Capstone)	3
Major-Specific		
MTH 229	Calculus/Analytic Geom I (CT)	5
MTH 230	Calculus/Analytic Geom II	4
MTH 231	Calculus/Analytic Geom III	4
MTH 335	Ordinary Diff Equations	3
STA 345	Applied Prob and Stat	3

CHM 211	Principles of Chemistry I	3
CHM 217	Principles of Chem Lab I	2
PHY 211	University Physics I	4
PHY 202	General Physics I Laboratory	1
Select one of the following:		
BSC 120	Principles of Biology I (and 120L)	
or BSC 120H	Principles of Biology Honors	
CHM 212	Principles Chemistry II (and CHM 218)	
MTH 300	Intro to Higher Math	
MTH 329	Elementary Linear Algebra	
PHY 213	University Physics II (and PHY 204)	
STA 445	Probability & Statistics I	
ENGR 103	Freshman Engineering Seminar	1
ENGR 104	The Engineering Profession	1
Select one of the following:		
CE 102	Introduction to CAD	
ENGR 102	Introduction to CAD	
Select one of the following:		
CS 110	Computer Science I	
ENGR 111	Engineering Computations	
ME 111	Mech Engineering Computations	
ENGR 213	Statics	3
ENGR 214	Dynamics	3
ENGR 215	Engineering Materials	3
ENGR 216	Mech of Deformable Bodies	3
ENGR 217	Engineering Career Preparation	1
ENGR 219	Engineering Thermodynamics	3
ENGR 222	Engr Cost Analysis & Economy	3
ENGR 318	Fluid Mechanics	3
ENGR 319	Fluid Mechanics Laboratory	1
ENGR 451	Intro to Proj Management	3
ENGR 473	Capstone Senior Design	3
ME 245	Circuits and Instrumentation	3
ME 330	Manufacturing Methods/Design	3
SFT 235	Intro to Occup Safety (CT)	3
Engineering Elective Option		3
Select one of the following: Any 300-level or higher BME, CE, EE, ENGR, IE, or ME course not taken to satisfy degree requirements or area of emphasis requirements.		
Area of Emphasis Requirements		**24-33**

Semester Plan

First Year

First Semester		**Credit Hours**
ENGR 103	Freshman Engineering Seminar	1
ENGR 104	The Engineering Profession	1
MTH 229	Calculus/Analytic Geom I (CT)	5
ENG 101	Beginning Composition	3
CMM 103	Fund Speech-Communication	3
FYS 100	First Yr Sem Critical Thinking	3
UNI 100	Freshman First Class	1
	Credit Hours	**17**

Second Semester

CAD Course; one of the following:		2
CE 102	Introduction to CAD	
ENGR 102	Introduction to CAD	
Computations Course; one of the following:		3
CS 110	Computer Science I	
ENGR 111	Engineering Computations	
ME 111	Mech Engineering Computations	
MTH 230	Calculus/Analytic Geom II	4
PHY 211	University Physics I	4
PHY 202	General Physics I Laboratory	1
ENG 201	Advanced Composition	3
	Credit Hours	**17**

Second Year

First Semester

ENGR 213	Statics	3
MTH 231	Calculus/Analytic Geom III	4
CHM 211	Principles of Chemistry I	3
CHM 217	Principles of Chem Lab I	2
SFT 235	Intro to Occup Safety (CT)	3
	Credit Hours	**15**

Second Semester

ENGR 214	Dynamics	3
ENGR 216	Mech of Deformable Bodies	3
ENGR 222	Engr Cost Analysis & Economy	3
MTH 335	Ordinary Diff Equations	3
ENGR 217	Engineering Career Preparation	1
Emphasis Course 1		3
	Credit Hours	**16**

Third Year

First Semester

ENGR 318	Fluid Mechanics	3
ENGR 319	Fluid Mechanics Laboratory	1
ENGR 215	Engineering Materials	3
STA 345	Applied Prob and Stat	3
Emphasis Course 2		3
Emphasis Course 3		3
	Credit Hours	**16**

Second Semester

ENGR 219	Engineering Thermodynamics	3
ME 245	Circuits and Instrumentation	3
ME 330	Manufacturing Methods/Design	3
Math Science Elective		3-5
Emphasis Course 4		3
	Credit Hours	**15-17**

Fourth Year

First Semester

ENGR 451	Intro to Proj Management	3
Engineering Elective Option		3-4

Emphasis Course 5		3
Emphasis Course 6		3
Core II Social Science (MC/I, WI)		3
	Credit Hours	**15-16**
Second Semester		
ENGR 473	Capstone Senior Design	3
Emphasis Course 7		3
Emphasis Course 8		3
Core II Humanities (WI, CT)		3
Core II Fine Arts		3
	Credit Hours	**15**
	Total Credit Hours	**126-129**

- Engineering, General Emphasis (http://catalog.marshall.edu/undergraduate/programs-az/engineering-computer-sciences/college-programs/engineering-bse/engineering-general-emphasis/)
- Engineering, Industrial and Systems Emphasis (http://catalog.marshall.edu/undergraduate/programs-az/engineering-computer-sciences/college-programs/engineering-bse/engineering-industrial-systems-emphasis/)