

ENGINEERING, BACHELOR OF SCIENCE (B.S.)

Bachelor of Science in Engineering

Program Description:

The Bachelor of Science (B.S.) degree in Engineering prepares graduates to become practicing engineers equipped with the fundamental knowledge and skills to address complex challenges across a range of engineering applications. The program emphasizes the application of engineering principles, science, and mathematics to effectively identify, formulate, and solve problems. Students develop the ability to apply engineering design processes to produce innovative solutions and systems that meet specified needs, always considering public health, safety, and welfare, alongside broader global, cultural, social, environmental, and economic factors.

Our curriculum fosters core technical competencies, promotes the lifelong learning essential for adapting to evolving technological landscapes, and cultivates the ethical and professional responsibilities expected within the engineering profession. Graduates are prepared to contribute meaningfully to their profession and communities through effective communication, collaborative teamwork, and a commitment to ethical practice. The program integrates theoretical knowledge with practical application, preparing graduates to analyze, design, and improve processes and systems effectively. *Students will have opportunities to focus their studies in specific areas of engineering practice through elective coursework.*

Program Educational Objectives (PEOs):

Within a few years of graduation, graduates of the B.S. in Engineering program are expected to:

1. Be established practitioners who successfully apply engineering principles to identify, formulate, and solve problems in their respective industries.
2. Advance professionally through continued learning and adapting to evolving engineering challenges.
3. Contribute effectively and ethically to the engineering profession and their communities.

Student Outcomes (SOs):

Upon graduation, students in the B.S. in Engineering program will have demonstrated:

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 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.

Program Constituencies:

The primary constituencies of the B.S. in Engineering program are:

- Program faculty
- Department of Engineering and Technology Advisory Council

Program Requirements

CIP Code: 14.0101

Major

Code	Title	Hours
University Graduation Requirements		
General Education (http://catalogs.eku.edu/undergraduate/general-academic-information/general-education-requirements/)		36
Foundations of Learning		
GSD 101	Foundations of Learning	3
Upper division courses (42 hrs. distributed throughout Major/Supporting/Gen Ed/Free Electives categories)		
Major Requirements		
Core Courses		46
AEM 201	Metallic Material Processes	3
AEM 301	Non-Metallic Material Processes	3
MFE 150	Manufacturing Engineering: Design, Processes, and Impacts	3
MFE 195	Engineering Graphics and Design	3
MFE 202	Statistical Quality Control	3
MFE 330	Materials Testing and Measurement	3
MFE 407	Engineering Project Management	3
MFE 498	Senior Capstone Design Project I	3
MFE 499	Senior Capstone Design Project II	3
PHY 221	Statics	3
PHY 315	Electrical Circuits	4
PHY 360	Engineering Dynamics	3
PHY 375	Engineering Thermodynamics	3
PHY 380	Fluid Mechanics	3
CSC 174	Introduction to Programming for Science & Engineering	3
Concentrations		
Students must select one of the following Concentrations:		9
Advanced Manufacturing		
Quality and Lean Manufacturing		
Supporting Course Requirements		22
CHE 111 & 111L	General Chemistry and General Chemistry Lab I (Element 4) ^G	1
ECO 230	Fundamentals of Microeconomics (Element 5B) ^G	
MAT 234	Calculus I (Element 2) ^G	

MAT 244	Calculus II	4
MAT 353	Differential Equations	3
PHY 201	University Physics I (Element 4) ^G	2
PHY 202	University Physics II (Element 4) ^G	5
STA 270	Applied Statistics (Element 2) ^G	4
STA 340	Applied Regression Analysis	3

The addition of a certificate or minor to this program is highly recommended.

<i>Free Electives</i>	<i>4</i>
Total Hours	120

G Course also satisfies a General Education element. Supporting hours are included within the 36 hr. General Education requirement above.

Advanced Manufacturing Concentration

Code	Title	Hours
Concentration Courses		
Choose nine hours from the following:		9
MFE 352	Industrial Robotics and Automation	
MFE 382	Advanced Manufacturing Processes	
MFE 390	Computer-Aided Design and Analysis	
MFE 453	Additive Manufacturing	
Total Hours		9

Quality and Lean Manufacturing Concentration

Code	Title	Hours
Concentration Courses		
Choose nine hours from the following:		9
MFE 308	Lean Manufacturing Systems	
MFE 332	Statistical Process Control and Quality Auditing	
MFE 506	Lean Six Sigma for Manufacturing	
STA 570	Quality Control & Reliability	
STA 585	Experimental Design	
Total Hours		9