

MECHANICAL ENGINEERING, BACHELOR OF SCIENCE (BS)

This degree combines studies in selected areas of engineering, physics, mathematics, and science to prepare students to solve real-world problems in mechanical engineering. The Bachelor of Science in Mechanical Engineering Degree is accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org>). The first two years of the curriculum allow students to establish a solid foundation in mathematics, sciences and introduces foundation subjects in mechanical engineering. The third and fourth year curriculum explores further areas in Mechanical Engineering and a capstone is introduced in the fourth year. The senior year capstone course allows the students to consolidate their education experience. The primary objective of the Mechanical Engineering program is to prepare students to enter and progress in mechanical engineering positions in business, industry and government. Graduates are generally expected to work in the research and development of ideas, products and processes by applying engineering principles to the solution of practical problems in the mechanical engineering field.

Minimum required to apply for admission to the Mechanical Engineering Program

Students must have completed, or be scheduled to complete, the following courses by the end of winter quarter.

MATH 161, MATH 162 and MATH 163; All ≥ 2.0

PHYS 151, PHYS 152, PHYS 153, PHYS 161, PHYS 162 and PHYS 163; All ≥ 2.0

MENG 240 and MENG 241; All ≥ 2.0

ENGL 201; ≥ 2.0

CHEM 151

Students must apply for admission to the Mechanical Engineering program at EWU (<http://www.ewu.edu/cstem/programs/engineering/engineering-degrees/bsme>) by February 15. Admission is based upon the student's GPA in the core courses listed above and a short essay.

Note: pre-program prerequisites include MATH 141, MATH 142, METC 102, METC 110.

Required Supporting Outside Department Courses

CHEM 151	GENERAL CHEMISTRY	5
MATH 161	CALCULUS I	5
MATH 162	CALCULUS II	5
MATH 163	CALCULUS III	5
MATH 241	CALCULUS IV	5
MATH 347	INTRODUCTORY DIFFERENTIAL EQUATIONS	4
PHYS 151	GENERAL PHYSICS I	4
PHYS 152	GENERAL PHYSICS II	4
PHYS 153	GENERAL PHYSICS III	4
PHYS 161	MECHANICS LABORATORY	1
PHYS 162	HEAT AND OPTICS LABORATORY	1
PHYS 163	INSTRUMENTATION LAB I	1

Required Departmental Courses

MENG 201 or CSCD 255	MATLAB C PROGRAMMING FOR ENGINEERS	4-5
MENG 207	ELECTRICITY	4
MENG 217	3D PARAMETRIC COMPUTER AIDED DESIGN	4
MENG 240	STATICS	4
MENG 241	STRENGTH OF MATERIALS	4
MENG 242	DYNAMICS	4
MENG 353	INDUSTRIAL MATERIALS	5
MENG 380	THERMODYNAMICS	5
MENG 381	LABORATORY ANALYSIS AND REPORTS	5
MENG 382	FLUID MECHANICS	5
MENG 385	ROBOTICS AND AUTOMATION	5
MENG 386	ENGINEERING NUMERICAL ANALYSIS	5
MENG 405	DESIGN OF MACHINE ELEMENTS	5
MENG 412	FUNDAMENTALS OF ENGINEERING	2
MENG 452	ENGINEERING ECONOMICS	2
MENG 490A	SENIOR CAPSTONE: DESIGN LABORATORY I	2
MENG 490B	SENIOR CAPSTONE: DESIGN LABORATORY II	3
MENG 493	SENIOR SEMINAR	1
METC 456	ENGINEERING ETHICS, CONTRACTS AND PATENTS	2
TECH 301	METALLIC PROCESSES	5
TECH 393	TECHNOLOGY WORLD CIVILIZATION	4

Required Track—choose one of the following 15

Materials & Computational Mechanics

MENG 453	MATERIALS AND DESIGN
MENG 455	COMPOSITE MATERIALS
MENG 492	FINITE ELEMENT ANALYSIS

Robotics & Automation

MENG 485	ADVANCED ROBOTICS AND AUTOMATION
MENG 486	PROGRAMMABLE LOGIC CONTROLLERS IN AUTOMATION
MENG 487	SENSORS THEORY FOR AUTOMATION

Thermo Sciences

MENG 407	HVAC
MENG 444	HEAT TRANSFER
MENG 482	ADVANCED FLUID DYNAMICS

Required Electives—choose two 10

Note: students may select electives from a different track listed above or from the list below.

METC 417	ADVANCED PARAMETRIC DESIGN
METC 468	QUALITY ASSURANCE AND INTRO TO LEAN
MENG 495	INTERNSHIP
or MENG 491	SENIOR THESIS

Total Credits 149-150

For information on General Education, see Undergraduate Degree (<http://catalog.ewu.edu/archives/2016-2017/undergraduate-degree>).

Student Learning Outcomes—students will

- apply knowledge of mathematics, science and engineering;
- design and conduct experiments, as well as analyze and interpret data;

- design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability;
- function on multidisciplinary teams;
- identify, formulate, and solve engineering problems;
- understand professional and ethical responsibility;
- communicate effectively;
- have the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- recognize the need for and demonstrate an ability to engage in life-long learning;
- have a knowledge of contemporary issues;
- use the techniques, skills and modern engineering tools necessary for engineering practice.