

MECHANICAL ENGINEERING, BACHELOR OF SCIENCE

Mechanical engineering is the profession which designs, develops, and manufactures machines that produce, transmit, or use power. Mechanical engineers are involved in the design, development, and production of virtually every product one can imagine. The range of job possibilities for mechanical engineers, both in location and function, is limitless.

The mechanical engineering program at Arkansas Tech is designed to give its students a solid grounding in the machine design and thermal systems areas and to satisfy the engineering manpower needs of industry in Arkansas and the mid-south region. The required courses provide a basic foundation in mechanical engineering with a strong cross-disciplinary component and an emphasis on engineering design. The Bachelor of Science in Mechanical Engineering program is accredited by the Engineering Accreditation Committee of ABET, <http://www.abet.org>.

Most graduates of the engineering program go directly into the work force as practicing engineers. Many are employed by manufacturing companies in the Arkansas River Valley area, while others have obtained positions with large national and multinational corporations. A number of graduates have elected to attend one of many different graduate schools specializing in disciplines such as engineering (electrical, mechanical, industrial, or nuclear), mathematics, physics, or business.

The first two years of the curriculum contain the needed mathematics, science, and engineering science basics to prepare the student for the upper-level mechanical engineering courses. The junior and senior years include 12 hours of engineering electives which allows the student to concentrate in one of the available areas of specialization which include manufacturing, machine design, nuclear systems, or thermal systems.

For a detailed policy regarding transfer credit for the Mechanical Engineering programs, please see the Department of Mechanical Engineering (<https://catalog.atu.edu/undergraduate/programs/stem/engineering-computing-sciences/mechanical-engineering/>) page.

It is highly recommended that all freshmen engineering students starting fall 2017 purchase laptop computers. Laptop computer specifications are at: <https://www.atu.edu/engineering/specifications.php>.

Curriculum

The matrix below is a sample plan for all coursework required for this program.

Course	Title	Hours
Freshman		
Fall		
ENGL 1013	Composition I ¹	3
FAH 1XXX	Fine Arts and Humanities Courses ¹	3
MATH 2914	Calculus I	4
CHEM 2124 & CHEM 2120	General Chemistry I and General Chemistry I Lab	4
MCEG 1011	Introduction to Mechanical Engineering	1
TECH 1001	Orientation to the University	1
Hours		16
Spring		
ENGL 1023	Composition II ¹	3
PHYS 2114 & PHYS 2000	Calculus-Based Physics I and Physics Laboratory I	4

MATH 2924	Calculus II	4
MCEG 1002	Engineering Graphics	2
MCEG 2203	Computational Methods in Engineering	3
Hours		16

Sophomore

Fall		
Select one of the following:		
CHEM 2134 & CHEM 2130	General Chemistry II and General Chemistry II Lab	4
PHYS 2124 & PHYS 2010	Calculus-Based Physics II and Physics Laboratory II	
MATH 2934	Calculus III	4
MCEG 2013	Statics	3
MCEG 2023	Engineering Materials	3
Hours		14

Spring

SS 1XXX	Social Science Courses ¹	3
ELEG 2103	Electric Circuits I	3
MATH 3243	Differential Equations I	3
MCEG 2033	Dynamics	3
MCEG 3013	Mechanics of Materials	3
Hours		15

Junior

Fall		
ELEG 2113	Electric Circuits II	3
MCEG 3313	Thermodynamics I	3
MCEG 3413	Fundamentals of Mechanical Design	3
MCEG 3442	Mechanical Laboratory I	2
ENGR Electives ^{2,3}		3
Hours		14

Spring

MCEG/ELEG 4202	Engineering Design	2
MCEG 4403	Mechanics of Fluids and Hydraulics	3
MCEG 4423	Machine Component Design	3
MATH Elective ⁴		3
ENGR Electives ^{2,3}		3
Hours		14

Senior

Fall		
USHG 1XXX	U.S. History and Government ¹	3
MCEG/ELEG 3003	System Modeling and Analysis	3
MCEG 4433	Thermodynamics II	3
MCEG 4442	Mechanical Laboratory II	2
MCEG 4491	Mechanical Design Project I	1
Technical Elective ^{3,5}		3
Hours		15

Spring

FAH 1XXX	Fine Arts and Humanities Courses ¹	3
ELEG 4303	Control Systems	3
MCEG 4443	Heat Transfer	3
MCEG 4492	Mechanical Design Project II	2
ENGR Lab Elective ⁶		2
ENGR Electives ^{2,3}		3
Hours		16
Total Hours		120

¹ See appropriate alternatives or substitutions in "General Education Requirements (<https://catalog.atu.edu/undergraduate/general-education-requirements/>)".

² 3000-level or above ELEG or MCEG course with minimum of three (3) hours at the 4000-level and approval of advisor.

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³ Seniors admitted to the Accelerated BSME to Masters of Engineering in Mechanical Engineering Program are able take up to 12 credit hours at the 5000-level that can count as 4000-level courses. The following courses may be used to fulfill the engineering and technical elective requirements in the BSME program: MCEG 5043 Physical Metallurgy, MCEG 5053 Corrosion Principles, MCEG 5323 Power Plant Systems, MCEG 5343 Internal Combustion Engines, MCEG 5413 Finite Element Analysis, MCEG 5463 Heating, Ventilating, and Air-Conditioning Design, MCEG 5473 Mechanical Vibrations, MCEG 5503 Nuclear Power Plants I, and MCEG 5993 Special Problems in Engineering I.

⁴ Mathematics elective course to be chosen with approval of advisor from list of eligible courses maintained in the departmental office.

⁵ Technical elective course to be chosen with approval of advisor from list of eligible courses maintained in the departmental office.

⁶ 3000-level or above ELEG or MCEG laboratory class.