

DEPARTMENT OF MECHANICAL ENGINEERING

The Department of Mechanical Engineering offers a four-year degree program leading to the Bachelor of Science in Mechanical Engineering (BSME) and a two-year degree program in Nuclear Technology. The program leading to the Bachelor of Science in Mechanical Engineering (BSME) degree is accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET).

The mission of the Department of Mechanical Engineering at Arkansas Tech University is to develop and maintain accredited programs leading to the Bachelor of Science degree. The department is committed to providing its students with a positive atmosphere in which to learn the fundamentals of engineering practice including engineering science and design. In order to meet its mission, the department has established educational objectives for its program.

The educational objectives of the engineering program of the Department of Mechanical Engineering at Arkansas Tech University are to:

1. Produce graduates who embark upon successful careers and engage in lifelong learning.
2. Produce graduates trained in methods of engineering analysis including the mathematical and computational skills appropriate for solving engineering problems.
3. Produce graduates with skills pertinent to the design process including the ability to formulate problems, to think creatively, to communicate effectively, to synthesize information and to work collaboratively.
4. Produce graduates able to use current experimental and data analysis techniques for application to engineering problems.
5. Instill in its graduates an understanding of their professional and ethical responsibilities.

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 the students a solid grounding in the machine design and thermal systems areas and to help 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 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 machine design, nuclear systems, or thermal systems.

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Mechanical Engineering

Pre-professional curriculum

Prior to enrolling in any 3000 or 4000-level engineering course, students must successfully complete a pre-professional curriculum containing preparatory courses normally taken during the first three semesters. The pre-professional curriculum is composed of the following courses:

- ENGL 1013 and 1023 (or equivalent)
- MATH 2914 and 2924
- CHEM 2124
- PHYS 2114

Satisfactory completion of the pre-professional curriculum is defined as a grade of "C" or better in each course or, alternatively, a grade point average of 2.20 or greater for the courses comprising the pre-professional curriculum. Students should meet with their advisor during the semester in which they anticipate completing the pre-professional curriculum to complete the procedure for admittance to upper-level engineering classes.

Most graduates of the engineering programs go directly into the work force as practicing engineers. Many are employed by the numerous small manufacturers in the Arkansas River Valley area. Others have obtained positions with larger companies such as Texas Instruments, Motorola, or Entergy. 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.

Transfer of Credit

Students wishing to transfer into one of the programs offered by the Department of Mechanical Engineering are urged to contact the Department Chair as soon as possible to reduce the possibility of taking non-transferable courses. Course work taken at another institution must meet the requirements of the Arkansas Tech University transfer policies and, in addition, are subject to the department's current transfer policy. Contact the Department of Mechanical Engineering for the latest course transfer information and policy.

Students planning to transfer to another university can, in most cases, complete the first two years of work at Arkansas Tech University. Students who plan to transfer should consult with the school to which they plan to transfer to coordinate details.

The following curriculum represents the program of study and a suggested sequence for the Bachelor of Science in Mechanical Engineering degree. The student should be aware that not all courses are offered each semester and that the ordering of courses is subject to change. In order to minimize scheduling difficulties, each student should schedule a special session with their advisor at the beginning of their junior year to plan the remaining coursework.

Bachelor of Science in Mechanical Engineering (BSME)

Freshman Year	Fall	Spring
Engineering Graphics (MCEG 1002)	2	
Intro to Engineering (ELEG/MCEG 1012)	2	
Biological Science ¹	4	
Physical Activity ¹	1	
English Composition I, II (ENGL 1013, 1023) ¹	3	3
Calculus I, II (MATH 2914, 2924)	4	4
General Chemistry (CHEM 2124)		4
Social Science ¹		3
Fine Arts ¹		3
Total	16	17

Bachelor of Science in Mechanical Engineering (BSME)

Sophomore Year

Calculus III (MATH 2934)	4	
Statics (MCEG 2013)	3	
Engineering Materials (MCEG 2023)	3	
Programming in C (COMS 2803)	3	
Physics I, II (PHYS 2114, 2124)	4	4
Mechanics of Materials (MCEG 3013)		3
Dynamics (MCEG 2033)		3
Applied Statistics (MATH 3153)		3
Physical Activity ¹		1
Differential Equations (MATH 3243)		3
Total	17	17

Junior Year

Electric Circuits I (ELEG 2103)	3	
Mechanical Lab I (MCEG 3442)	2	
Thermodynamics I (MCEG 3313)	3	
Fundamentals of Mechanical Design (MCEG 3413)	3	
Principles of Economics I (ECON 2003)	3	
Humanities ¹	3	
Social Science ¹		3
Electric Circuits II (ELEG 2113)		3
Electric Circuits Lab (ELEG 2111)		1
Machine Component Design (MCEG 4423)		3
Mechanics of Fluids and Hydraulics (MCEG 4403)		3
Engineering Modeling & Design (ELEG/MCEG 3003)		3
Total	17	16

Senior Year

Engineering Design (ELEG/MCEG 4202)	2	
Thermodynamics II (MCEG 4433)	3	
Mechanical Lab II (MCEG 4442)	2	
Social Science ¹	3	
Engineering Electives ³	6	6
Engineering Lab Elective ²		1
Control Systems I (ELEG 4303)		3
Heat Transfer (MCEG 4443)		3
Design Project (MCEG 4493)		3
Total	16	16

¹See appropriate alternatives or substitutions in "General Education Requirements" on page 76.

²3000-level or above ELEG or MCEG laboratory class

³3000-level or above ELEG or MCEG course with minimum of three (3) hours at the 4000-level and approval of advisor.

Nuclear Technology

The department also offers a two-year program leading to the Associate of Science in Nuclear Technology (ASNT) degree. This degree is designed to allow the student to obtain the knowledge base and training necessary to work in one of the many areas in the nuclear field. While many technology degrees, especially at the associate's level, are seen as less rigorous paths, the ASNT program at Arkansas Tech University includes most of the same courses as the first two years of the engineering programs.

Graduates of the program leading to the Associate of Science Degree in Nuclear Technology may find employment in many areas of the nuclear industry. Many past ASNT graduates have continued their studies to obtain bachelors degrees in engineering or the physical sciences either at Arkansas Tech University or at other institutions.

Associate of Science in Nuclear Technology (ASNT)

Freshman Year	Fall	Spring
Introduction To Engineering (ELEG/MCEG 1012)	2	
Engineering Graphics (MCEG 1002)	2	
Social Sciences ¹	3	
General Chemistry (CHEM 2124)	4	
English Composition I, II (ENGL 1013, 1023) ¹	3	3
Calculus I, II (MATH 2914, 2924)	4	4
Engineering Materials (MCEG 2023)		3
Technical Elective ²		6
Physical Activity ¹		1
Total	18	17
Sophomore Year		
Statics (MCEG 2013)	3	
Calculus III (MATH 2934)	4	
Basic Nuclear Engineering (MCEG 3503)	3	
Thermodynamics I (MCEG 3313)	3	
General Physics I, II (PHYS 2114, 2124)	4	4
Dynamics (MCEG 2033)		3
Radiation Detection Laboratory (MCEG 3512)		2
Electric Circuits I (ELEG 2103)		3
Radiation Health Physics (MCEG 3523)		3
Physical Activity ¹		1
Total	17	16

¹See appropriate alternatives or substitutions in "General Education Requirements" on page 76.

²Mathematics, science, or engineering elective must be approved by an engineering advisor and the Mechanical Engineering Department Chair.