Bachelor of Science in Mechanical Engineering

About This Program

The mechanical engineer needs to be extremely versatile and can be found in a large variety of private and public sector organizations. He or she may be involved in product design and development, manufacturing, project management, power generation or other operations. Therefore, the Bachelor of Science in Mechanical Engineering curriculum is broad-based and emphasizes fundamental engineering sciences and applications. Approximately equal emphasis is given to machine design, structural analysis, thermodynamics and energy, systems and control, and materials science. Classroom lectures are supplemented by laboratories. The student completes a capstone design project as the culmination of the undergraduate program.

ABET ACCREDITATION

The Mechanical Engineering program is accredited by the Engineering Accreditation Commission of ABET (https://www.abet.org/), under the commission's General Criteria and the Program Criteria for Mechanical Engineering and Similarly Named Engineering programs. The Mechanical Engineering program has been accredited since 1967.

PROGRAM EDUCATIONAL OBJECTIVES

The program is designed so that a few years following graduation students will be able to:

- Demonstrate professional growth through their employment in mechanical, aerospace, or related engineering organizations, or by progressing in their postgraduate studies in engineering or other professional disciplines.
- Become an active participant in professional society activities,
- Demonstrate the initiative, motivation and ability to grow professionally in their chosen endeavor.

STUDENT OUTCOMES

Upon completion of the degree, students will be able to:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. 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. Communicate effectively with a range of audiences.
4. 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. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

Admissions Criteria

For admission to the aerospace engineering and mechanical engineering programs, students must meet the requirements for admission to the College of Engineering. For unconditional transfer into the department, a student must have a minimum grade point average of 2.50 in all science, mathematics and engineering courses, a minimum 3-GPA calculation of 2.50 in UTA coursework, and a total of no more than four unsuccessful attempts in engineering courses.

ADVANCEMENT INTO THE PROFESSIONAL PROGRAM

Requirements for advancement into the professional programs are in accordance with those in the College of Engineering with the following additional stipulations.

- Each student must have a total of no more than four unsuccessful attempts in engineering courses and complete all pre-professional courses with a minimum grade of C in each course and a minimum GPA of 2.50 on a 4.0 scale in each of three categories:
  - overall,
  - required math, science, and engineering courses, and
  - required MAE courses.
- Application to the professional program is to be made to the undergraduate advisor during the semester following completion of the last pre-professional course.
- No professional Mechanical and Aerospace Engineering course may be taken unless the student is admitted into the professional program or obtains the consent of the undergraduate advisor. Professional courses may be taken to fill out a schedule in the semester that the last pre-professional course is taken.

- Some professional Mechanical and Aerospace Engineering courses are offered only once a year. Students are urged to plan their course sequence schedules carefully to avoid delaying their graduation.

Curriculum

Foundations		
General Core Requirements (https://catalog.uta.edu/academicregulations/degreerequirements/generalcorerequirements/)		42
Students are required to complete specific courses in certain core areas. Those included in the preprofessional program are identified with a footnote.		
In addition to the specified courses, students must chose 6 hours of U.S. History, 6 hours of Political Science, 3 hours of Language, Philosophy, Culture, and 3 hours of Creative Arts from the general education core.		
For Communication select:		
COMS 2302	PROFESSIONAL AND TECHNICAL COMMUNICATION FOR SCIENCE AND ENGINEERING	
ENGL 1301	RHETORIC AND COMPOSITION I [1]	
For Life & Physical Science select:		
PHYS 1443	GENERAL TECHNICAL PHYSICS I [1]	
PHYS 1444	GENERAL TECHNICAL PHYSICS II [1]	
For Mathematics select:		
MATH 1426	CALCULUS I [1]	
MATH 2425	CALCULUS II [1]	
For Social & Behavioral Science select:		
ECON 2305	PRINCIPLES OF MACROECONOMICS	
or IE 2308	ECONOMICS FOR ENGINEERS	
For Foundational Component Area option select:		
MATH 2326	CALCULUS III [1]	
Mechnical Engineering Foundations (Pre-Professional Program)		
Extra hours from required core courses that are part of the pre-professional program.		4
UNIV-EN 1131	STUDENT SUCCESS [2]	1
or ENGR 1101	ENTRANCE TO ENGINEERING FOR TRANSFER STUDENTS	
MAE 1140	PROBLEMS IN MECHANICAL AND AEROSPACE ENGINEERING	1
MATH 3330	INTRODUCTION TO LINEAR ALGEBRA AND VECTOR SPACES	3
CHEM 1465	CHEMISTRY FOR ENGINEERS	4
EE 2320	CIRCUIT ANALYSIS	3
MAE 1107	INTRODUCTION TO MECHANICAL ENGINEERING	1
MAE 1312	ENGINEERING STATICS	3
MAE 1351	INTRODUCTION TO ENGINEERING DESIGN	3
MAE 2312	SOLID MECHANICS	3
MAE 2323	DYNAMICS	3
MAE 2360	NUMERICAL ANALYSIS & PROGRAMMING	3
MAE 2381	EXPERIMENTAL METHODS AND MEASUREMENTS	3
MAE 3310	THERMODYNAMICS I	3
MAE 3324	STRUCTURE & MECHANICAL BEHAVIOR OF MATERIALS	3
MAE 3360	ENGINEERING ANALYSIS	3
Mechanical Engineering Professional Program (Specialization) [3]		
MAE 3181	MATERIALS AND STRUCTURES LAB	1
MAE 3183	MEASUREMENTS LABORATORY II	1

MAE 3185	INTRODUCTION TO MECHATRONICS (This course is new for fall 2021)	1
MAE 3242	MECHANICAL DESIGN I	2
MAE 3311	THERMODYNAMICS II	3
MAE 3313	FLUID MECHANICS	3
MAE 3314	HEAT TRANSFER	3
MAE 3318	KINEMATICS AND DYNAMICS OF MACHINES	3
MAE 3319	DYNAMIC SYSTEMS MODELING AND SIMULATION	3
MAE 3344	INTRODUCTION TO MANUFACTURING ENGINEERING	3
MAE 4188	DESIGN PROJECT LABORATORY II	1
MAE 4287	DESIGN PROJECT I	2
MAE 4310	INTRODUCTION TO AUTOMATIC CONTROL	3
MAE 4342	MECHANICAL DESIGN II	3
MAE 4344	COMPUTER-AIDED ENGINEERING	3
Technical Electives		
Select three 3000/4000-level courses in engineering, science, or mathematics with prior approval of the academic advisor.		9
Total Hours		**130**

1 Core course included in the pre-professional program
2 UNIV-EN 1131 is required for students admitted as freshman. ENGR 1101 is required for students admitted as transfer.
3 All pre-professional courses must be completed before enrolling in professional courses.

Total hours completed will depend upon prior preparation and academic qualifications.

MECHANICAL AND AEROSPACE ENGINEERING DOUBLE MAJOR

A student wishing to obtain a double major in mechanical engineering and aerospace engineering under a single degree, simultaneously prior to graduation, can integrate the courses for the double major requirement throughout his/her undergraduate career at UT Arlington. When applying for graduation, a student should note on the application that he/she will be completing an additional major. One diploma is issued and both majors are recorded on a student's transcript and diploma. The student is encouraged to consult with the Undergraduate Advisor on the appropriate course of study.

Program Completion

ACADEMIC HONESTY

The College of Engineering takes academic honesty and ethical behavior very seriously. Engineers are entrusted with the safety, health, and well being of the public. Students found guilty of academic dishonesty will be punished to the full extent permitted by the rules and regulations of UT Arlington. In particular, a student found guilty of a second offense by the Office of Community Standards will be subject to dismissal from the College of Engineering

ACADEMIC STANDING

To be in good academic standing within the MAE department, each mechanical engineering and aerospace engineering student in the pre-preprofessional program must maintain a minimum 3-GPA calculation of 2.50 and have a total of no more than four unsuccessful attempts in engineering courses. Further, in the professional program, each student must maintain a minimum UTA cumulative GPA of 2.0 and a minimum major GPA of 2.0.

ADDITIONAL REQUIREMENTS

Requirements for the bachelor of science in mechanical engineering and bachelor of science in aerospace engineering are in accordance with those of the University and the College of Engineering with the following additional stipulations.

- Each student must complete all professional courses stipulated under "Requirements for a Bachelor of Science Degree in Aerospace Engineering" or "Requirements for a Bachelor of Science Degree in Mechanical Engineering" with a minimum grade of C in each course.
- Each student must have a minimum UTA cumulative GPA of 2.0, and a minimum major GPA of 2.0. The major GPA includes all MAE courses in the degree plan.

- Mechanical Engineering and Aerospace Engineering students will satisfy the university general core curriculum and degree requirements most efficiently by selecting the specified courses in the course requirement table. Of these specified courses, ENGL 1301, MATH 1426, MATH 2425, MATH 2326, PHYS 1443 and PHYS 1444 are also required in the pre-professional program.
- After a student has begun the professional program at UT Arlington, it is required that further professional courses be completed at UT Arlington.

ORAL COMMUNICATION AND COMPUTER USE COMPETENCY REQUIREMENTS

Mechanical Engineering and Aerospace Engineering students will satisfy the Oral Communication Competency requirement by completing COMS 2302 and the Computer Use Competency requirement by completing MAE 2360.

Advising Resources

First time in college students meet with engineering advisors in the UAEC (UAECengineering@uta.edu). Transfer students are advised prior to New Maverick Orientation by the department. Students, please read all student emails carefully and consult the department advising webpage for additional contact information and answers to common questions.

Location:

204 Woolf Hall

Email:

maeundergrad@uta.edu

Phone:

817-272-2561

Web:

Additional Advising Information (https://www.uta.edu/academics/schools-colleges/engineering/academics/departments/mechanical-aerospace/students/ugadvising/)