Engineering - Mechanical Engineering Option, M.S.

DEPARTMENT

Mechanical Engineering
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Engineering East Building, Room 154
559.278.2368
www.fresnostate.edu/engineering/mechanical-engineering

MS in Engineering - Mechanical Engineering Option, M.S.
BS in Mechanical Engineering, B.S.
Courses Offered

Mechanical engineering is the use of basic science in the design and manufacture of components and systems. This requires the application of physical and mechanical principles in the development of machines, energy conversion systems, materials, and equipment for measurement and control. Knowledge of mathematics, physics, and chemistry lies at the core of this field. Application of this knowledge uses engineering technology -- a disciplined way of thinking, modeling, and testing that enables development of new systems despite incomplete information and uncertainty.

The undergraduate and graduate programs in mechanical engineering provide basics and advanced studies in design, advanced materials, alternative energy and sustainable systems, engineering mechanics, mechatronics and controls and thermo-fluids. All areas include statics, dynamics, materials, fluid mechanics, thermodynamics, and experimental methods. Application areas in design include mechanics of materials, applied mechanics, structural and manufacturing aspects of producing equipment, and vibrations. Application areas in thermal and fluid mechanics focus on energy conversion and include combustion, heat engines, refrigeration, and fluid flow.

Students should consult with their advisers to select the proper courses that emphasize their areas of interest.

Attainment of Engineer-in-Training (EIT) and Professional Engineering (PE) licensure are strongly recommended as first steps in professional lifelong learning.

Mission

Our mission is to provide a broad-based, practice-oriented Mechanical Engineering education that enables graduates to become technically proficient, professional leaders through engagement in the community and lifelong learning.

Program Educational Objectives - BSME

Our alumni (within three to five years after graduation) will:

1. Be engaged in a professional career of graduate studies using knowledge and skills obtained in their ME education;
2. Become leaders and effective communicators actively involved in their community for the betterment of society.

Student Outcomes-BSME

Upon the successful completion of the Bachelor of Science in Mechanical Engineering program at California State University, Fresno, students will have achieved the following:
a. an ability to apply knowledge of mathematics, science, and engineering
b. an ability to design and conduct experiments, as well as to analyze and interpret data
c. an ability to 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
d. an ability to function on multidisciplinary teams
e. an ability to identify, formulate, and solve engineering problems
f. an understanding of professional and ethical responsibility
g. an ability to communicate effectively
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
i. a recognition of the need for, and an ability to engage in life-long learning
j. a knowledge of contemporary issues
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
Accreditation
The Bachelor of Science in Mechanical Engineering program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org. The program has been continuously accredited since 1965.

Co-op Program
The department participates in a cooperative education program (Valley Industry Partnership (VIP) for cooperative education) which allows the student to gain industrial experience and financial benefits through projects with local companies.

REQUIREMENTS

Master of Science Programs Requirements
The Lyles College of Engineering offers a Master of Science in Civil Engineering and a Master of Science in Engineering (with options in Computer, Electrical, and Mechanical Engineering).

M.S. in Civil Engineering
M.S. in Engineering (Options in Computer, Electrical, and Mechanical Engineering)

The Master of Science in Engineering program has the following goals: (1) to develop the students’ advanced analytical skills by developing an in-depth understanding of major theoretical and practical engineering concepts; (2) to develop students’ written and oral communication skills applied to technical areas; (3) to achieve an appropriate level of competence by the students in solving practical electrical or mechanical engineering problems; (4) to develop students’ critical and creative thinking skills in mastering new topics required to understand and solve complex engineering problems; and (5) to allow the students to demonstrate a sufficient depth of knowledge in a substantive area of electrical or mechanical engineering to pursue advanced academic or industrial work.

Program Objectives
The program has the following objectives: (1) to complete a minimum of 30 units of graduate coursework, including appropriate core courses, (2) to successfully demonstrate knowledge base in culminating experience, and (3) to enhance the students’ career goals by increasing their theoretical, research, and problem-solving skills in applied engineering.

Program Requirements
The program consists of the following:

A. Main Core (1 unit)
ENGR 200

B. Option Core (9 units)
EE Option: ENGR 201, ECE 224; choose one from ECE 230, ECE 241, ENGR 206
CompE Option: ECE 278; choose two from ECE 240, 243, 274
ME Option (choose 3 courses): ENGR 201, 202, 205, 206

C. Electives (14 units)
CompE and EE Options: Choose from remaining upper-division and graduate courses. Minimum of 6 units from corresponding program electives. Maximum of 9 upper-division units. See advising notes.
ME Option: Choose from remaining upper-division and program courses. Maximum of 9 upper-division units. See courses in Mechanical Engineering.

D. Culminating Experience (6 units)
For either option, choose
1. 6 units of electives plus comprehensive exam, minimum of 3 units from corresponding program electives, or
2. ECE 298 or ME 298 Project (3 units) plus 3 units of program electives, or
3. ECE 299 or ME 299 Thesis (6 units)

Total (30 units)

Advising Notes
3. Approved graduate courses may be taken with the permission of the department of the program of study.

Up to nine semester hours of satisfactory graduate credit may be transferred into the program from other institutions if not used in completing another graduate degree program. Undergraduate courses may be transferred if the courses were not used in completing another degree program. The total undergraduate upper-division semester hours applied to this degree program cannot exceed nine hours.

The Graduate Record Examination (GRE) Aptitude Test is required of all students prior to advancement to candidacy status.

The program requires extensive use of a computer; therefore, students are expected to have their own computer or access to one 24 hours a day.

**Admission to the University.** Requirements for admission to California State University, Fresno are in accordance with Title 5, Chapter 1, Subchapter 3 of the California Code of Regulations.

**Admission to the Program.** Students who apply to the program are placed in one of the following categories:

1. **Graduate Standing, Classified.** Students with (a) an undergraduate degree in an appropriate engineering discipline from an ABET accredited program, (b) an undergraduate grade point average of 3.0, (c) a minimum GRE quantitative score of 550 are eligible for classified (degree status) graduate standing, and (d) a letter of recommendation from an academic or an industrial source.
2. **Graduate Standing, Conditionally Classified.** Students from non-ABET accredited engineering programs, or with a degree in physical science or mathematics or a different engineering discipline, and who have not met the requirements of category 1, will be given conditionally classified graduate standing. These students may be required to take prerequisite courses as determined by the graduate program at the time of admission. Upon satisfactorily meeting any specified requirements, students will then be advanced to classified standing.

**Degree Candidacy.** The following requirements must be met prior to advancement to candidacy:

1. Classified graduate standing.
2. Completion at California State University, Fresno of at least 9 units of the proposed program with a 3.0 average on all completed work appearing on the program.
3. A minimum grade point average of 3.0 in all required graduate coursework from the date of commencing the first course of the proposed master's degree program.
4. Departmental recommendation for advancement to candidacy.
5. Satisfactory completion of the Graduate Writing Skills Requirement.

**Nondegree students.** Students with a bachelor's degree may take graduate courses (concurrent with regular students) for credit or audit. Prior approval is required.

**Accelerated Graduate Programs**

The accelerated M.S. program provides a path to students who are talented and want to acquire additional knowledge in specialized areas of interest, as a continuation of their B.S., within a short period of time. The benefits to the students that participate in the program are as follows:

- More efficient use of their fourth academic year leading to a baccalaureate degree
- Ability to focus more rigorously on their areas of professional practice, culminating in a master's degree
- Opportunity to receive both B.S. and M.S. in five years

**Eligibility:** A student who has completed 75 units of required and elective G.E., math, science, and engineering coursework required for his/her undergraduate program may apply to the accelerated graduate program.

**Application Materials:** To apply to the accelerated graduate program, a student must submit the following:

- Application form
- A detailed statement of purpose
- Two letters of recommendation, at least one from a faculty member of the program
Timing of Application: Application may be made no sooner than at the beginning of the sixth semester of study of an undergraduate degree program. Students officially enter the program no earlier than the seventh semester of an eight-semester undergraduate program.

Requirements: The applicants must satisfy the following requirements:

• Overall GPA of 3.0 or greater at the time of application
• Satisfactory GRE scores (consult program advisers)
• Complete all the courses specified by the program by the end of the sixth semester with GPA of 3.0 or greater
• Complete no less than 30 units of coursework in residence by the end of the sixth semester
• Complete undergraduate writing requirement by the end of the sixth semester
• Complete all G.E. requirements prior to taking 200-level courses

Progress Toward Awarding of Degree: Students can take up to 10 units of courses that qualify for the M.S. program (but no more than 6 units of 200-level courses per semester) before completion of the B.S. program. Students shall not proceed with further graduate-level coursework until they have obtained the classified standing. The classified standing can be obtained by filing the appropriate form with the Office of Graduate Studies after the completion of the B.S.

Awarding of Degree: Students must meet all programmatic requirements for each degree. This implies that no coursework, project, independent study, etc., may be simultaneously applied toward meeting the requirements of the B.S. and M.S. Students must complete the requirement for the B.S. at least two semesters prior to completing the requirement for the M.S.

FACULTY

For faculty phone numbers and e-mail, see the campus directory.

For more on the faculty, see the faculty pages.
The faculty pages are updated by the department or program.

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<th>Name</th>
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