Mechanical Engineering, B.S.

DEPARTMENT

Mechanical Engineering

Dr. Gemunu Happawana, Chair
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

Bachelor of Science Degree Requirements

Mechanical Engineering Major

1. Major requirements (66 units) and additional requirements (21 units)

   **Major requirements (66 units)**

   ME 1, 2, 26, 31, 32, 95, 112, 115, 116, 118, 125, 135, 136, 140, 145, 154, 156 (40 units)
   CE 20, 121 (6 units)
   ECE 71 or CSCI 40, ECE 91, 91L (7 units)

   Design Applications (7 units)
   ME 155, 159, 166

   Technical Area Courses (6 units)
   Take a minimum of 3 units in Group A (ME 122, 137, 142, 144, 146, 162, or 164)
   A maximum of 3 units in Group B (ME 180, 190, 191T; ECE 121, 121L, 155) may be substituted for a course in Group A with faculty advisor's approval.

   **Additional requirements (21 units)**
   MATH 76, 77, 81* (see Advising Note 6), PHYS 4A, 4AL, 4B, 4C

   2. General Education requirements (49 units)

   COMM 3, 7, or 8 (GE Area A1); ENGL 10 (GE Area A2); HIST 11 or 12 (GE Area D1); select one course from each of the following GE Areas: B2 and D3; for C1 requirement, no additional course is necessary because the following ME major courses are double counted to satisfy this (ME 26, ME 95 and ME 135).

   The following courses are required to satisfy both G.E. and major requirements:
   CHEM 1A/1AL (GE Area B1)
   MATH 75 (GE Area B4)
   PHIL 20 (GE Area C2)
   PLSI 2 (GE Area D2)
   ME 134 (GE Area IB)
   For PHIL 120 (GE Area IC) requirement, no additional course is necessary because the following ME major courses are double counted to satisfy this (ME 135, ME 155 and ME 166).

   3. Other requirements (6 units)
   Upper-division writing and Multicultural and International (MI)**

   4. Sufficient elective units to meet required total units (if needed) (See Degree Requirements.)

   5. Total (123 units)**

   * ENGR 101 may be taken as an alternative with faculty advisor's approval.

   ** Engineering majors are exempt from G.E. areas A3, E, ID, and the third course in Area C. PLSI 120 may be taken to meet both major and MI requirements.

Advising Notes
1. Courses in mathematics, the physical sciences, or engineering taken CR/NC are not counted toward fulfillment of degree requirements in mechanical engineering.

2. Mechanical engineering majors might consider a math, physics, or business minor.

3. Since the mechanical engineering major curriculum is very demanding, many students, especially those not fully prepared in mathematics, chemistry, and/or physics, take 4 1/2 or more years to graduate rather than the traditional 4 years.

4. Advising is mandatory in the Lyles College of Engineering. A registration hold will be placed on students who fail to see their advisor at least once per academic year.

5. The Upper-Division Writing Skills requirement has to be completed no sooner than the term in which 60 units of coursework are completed or no later than the term in which 90 units are completed. This requirement can be met by passing the university writing examination or by taking ENGR 105W or a department-approved writing course. Must be taken and passed with a letter grade of C or better in the junior year if the student fails the writing exam requirement.

6. With faculty advisor approval, ENGR 101 may be taken instead of MATH 81.

**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.