

Engineering and Computer Science - Graduate Programs

College of Engineering and Computer Science

Campus advisers:

M.S. in Civil Engineering

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M.S. in Computer Science

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M.S. in Engineering

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Mechanical Engineering Option

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M.S. in Engineering

Electrical Engineering Option

Mechanical Engineering Option

Edwards Air Force Base

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Master of Science Programs

The College of Engineering and Computer Science offers Master of Sciences in Civil Engineering and Computer Science, as well as Engineering (with Options in Electrical and Mechanical Engineering.) Students at Edwards Air Force Base (AFB) may enroll in the Master of Science in Engineering program through the Edwards AFB coordi-

nator. It is not necessary for these students to visit the Fresno campus. To contact advisers for information on individual programs, see the list of advisers on this page.

Master of Science Programs

M.S. in Civil Engineering

See pages 284-285

M.S. in Computer Science

See pages 295-296

M.S. in Engineering (Options in 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 for each student: (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. Core Requirement**
(3 courses required) **9**
ENGR 202, 205, 206, 210
- B. Elective Courses** **15**
Approved upper division and graduate courses. See page 303 for courses in Electrical Engineering and page 307 for courses in Mechanical Engineering.

C. Culminating Experience 6

- Choose between
- 1. 6 units of electives plus comprehensive exam,
- 2. EE 298 or ME 298 Project (3) plus 3 units of electives, or
- 3. EE 299 or ME 299 Thesis (6)

Total 30

See department pages for course descriptions.

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 and the total undergraduate upper division semester hours applied to this degree program do not exceed nine hours.)

The Graduate Record Examination (GRE) Aptitude Test is required of all students prior to advancement to candidacy status. The Advanced Test in Engineering may be required as detailed in the section titled *Admission to Graduate Standing*. (Call the coordinator for information.) A GRE information booklet and application forms are available in the Edwards AFB resident coordinator's office or from the Division of Graduate Studies at California State University, Fresno.

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.

Faculty. All faculty are from the Fresno campus and from among qualified engineers in the Edwards A.F.B. area.

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 2.7, (c) a minimum GRE quantitative score of 450 are eligible for classified

(degree status) graduate standing, and (d) a letter of recommendation from and academic or an industrial source. Students who meet requirements (a) and (c) with a GPA below 2.7 must take the GRE Advanced Test in Engineering and achieve a score above the 50th percentile. In addition, to achieve classified standing these students must take three courses chosen by the coordinator and the department chair and complete these courses with a grade of *B* or higher.

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. 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 upper-division and 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 (concurrently with regular students) for credit or audit. Prior approval is required.

See the catalog Web site for core courses that may be applied to the programs. Visit <http://www.csufresno.edu/catoffice/current/engcore.html>.

Students Enrolling at Edwards AFB

Students at Edwards AFB have the following available to them. Other students should see individual department sections for information.

Military Personnel. Eligible military personnel may apply for tuition assistance (T.A.) which pays 75 percent of tuition cost. The student pays the remaining 25 percent at the time of registration. Officers (but not enlisted personnel) incur a two-year noncumulative service commitment following use of T.A.

Civilian Personnel. Government civilian employees may be eligible to have tuition paid by their government agency, if it can be shown that the course content is work related. Also, many industrial firms have programs to reimburse employees for tuition paid for courses successfully completed. Contact your education development officer or training office for details.

G.I. Benefits. Eligible veterans and active duty personnel with more than 180 days in service may apply for educational benefits. Those with service prior to Jan. 1, 1977, receive benefits under the old G.I. Bill, which reimburses the full tuition cost. Those entering service after Jan. 1, 1977, may be eligible under the new G.I. Bill, which is a contributory plan. Application for V.A. educational benefits may be made in the office of the resident coordinator at the time of registration. The forms are processed through the Fresno campus Veterans Office.

Textbooks. Textbooks normally are available in the California State University, Fresno office at Edwards A.F.B. prior to the first class meeting. In most cases, the cost of textbooks is not reimbursed by the government. Students should be prepared to pay by check.

Enrollment and Registration

Enrollment in the program may be accomplished in the office of the California State University, Fresno Edwards resident coordinator. It is not necessary to visit the Fresno campus. Students who wish to enroll are highly encouraged to contact the Edwards resident coordinator for a counseling appointment. Registration for individual courses generally is accomplished during the week prior to the start of classes. Dates and times for registration are announced by fliers and in the various EAFB media.

GRADUATE COURSES

(See *Course Numbering System*.)

Engineering (ENGR)

202. Applied Engineering Analysis (3)
Study of analytical tools used in the analysis and modeling of engineering systems. Emphasis is placed on solving problems in engineering disciplines.

205. Computing in Engineering Analysis (3)

Prerequisite: a first course in numerical analysis at the graduate level. Solution of engineering problems using digital computation. Modeling of engineering systems for numerical analysis.

206. Probability Theory and Statistical Analysis (3)

A first course in probability theory and statistical analysis at the graduate level. Finite sample spaces, conditional probability and independence, one-dimensional random variables, functions of random variables, two- and higher-dimensional random variables, poisson and other discrete random variables, continuous random variables, moment-generating function, reliability theory, sums of random variables, samples and sampling distributions, estimation of parameters, testing hypothesis.

210. Linear Control Systems (3)

A first-year graduate course covering the analysis, synthesis, and performance of linear control systems. Partial fraction expansion, Routh's criterion, the impulse function. Basic servo characteristics and types, block diagrams, transfer functions. A detailed treatment of the root locus method for analysis and synthesis. Frequency response, logarithmic and polar plots, Nyquist's criterion, stability characteristics, phase margin and gain margin.

212. Advanced Control Systems (3)

Prerequisite: ENGR 210 or permission of coordinator. Describing function analysis of nonlinear control systems; phase-plane analysis; Liapunov stability analysis; discrete-time systems; z-transform-method; linear stochastic systems; application of statistical design principles; optimal and adaptive control systems; digital control systems.

For a complete listing and descriptions of all graduate courses, see department pages 304 and 310.