

# ENGINEERING SCIENCES

**Department of Physics and Engineering**  
**School of Natural Sciences, Mathematics, and Engineering**  
**Department Chair:** Jorge Talamantes  
**Program Office:** Science Building III, 307  
**Telephone:** (661) 654-2664  
**email:** engineering@csub.edu  
**Website:** www.csub.edu/engineering  
**Faculty:** D. Abouelnasr, I. Ampatzidis, L. Cabrales Arriaga, A. Dzyubenko, V. Gasparyan, E. Lever, J. Lewis, R. Negrini, T. Meyer, D. Saini, J. Talamantes

## Program Description

Engineering Sciences is a broad-based general engineering degree program. As such, it provides the graduate flexibility, breadth of technical knowledge, and communication skills so important in today's rapidly changing multidisciplinary and multicultural work environment. The student may opt for a BS in Engineering Sciences with an Emphasis on Biosystems and Agricultural Engineering, Engineering Management, or Petroleum Engineering by the appropriate choice of electives.

The Engineering Sciences program provides a curriculum and course of training that prepares the student not only for today's challenges, but also for future ones in a fast-paced, global, and diverse society. The program emphasizes the fundamentals of engineering and modern methods, processes and technologies, and also gives the students the tools to learn by themselves and to pursue life-long learning. Furthermore, the program and the faculty strive to ensure that graduates also attain a global understanding of the environmental, ethical and societal impacts of the technologies they help develop.

The program offers opportunities for team-based design projects in collaboration with local industries and public institutions, thus preparing students for careers in for-profit and non-profit organizations, or to further their education in graduate school. Faculty members of the Department of Physics and Engineering will be pleased to advise any students who may wish to pursue this major. For student learning objectives and more information, visit our website at [www.csub.edu/engineering](http://www.csub.edu/engineering).

## Requirements for the Bachelor of Science Degree in Engineering Sciences

<b>Total Units Required to Graduate</b>	<b>180 units</b>
<b>Major Requirements</b>	<b>140 units</b>
ENGR Courses	88
Cognates	52
<b>Other University Requirements</b>	<b>40-47 units</b>
CSUB 101	2
American Institutions	10 <sup>a</sup>
Area A1, A2	10 <sup>b</sup>
Area B	0 <sup>b, c</sup>
Area C	10 <sup>a</sup>

Area D	5 <sup>a, d</sup>
Theme 1	0 <sup>b</sup>
Theme 2	0 <sup>e</sup>
Theme 3	0 <sup>c</sup>
GRE	3-5
GWAR (Exam) or Class	0-5

<sup>a</sup>Assumes PLSI 101 or PPA 275 is taken to double-count American Institutions and Area D3. HIST 231 or 232 will double-count American Institutions and Area C3

<sup>b</sup>A3, B1, B3, Theme 1 satisfied in major or cognate

<sup>c</sup>B2 and Theme 3 requirements waived for Engineering Sciences majors

<sup>d</sup>Engineering Sciences majors have a 5-unit reduction in area D requirements

<sup>e</sup>PHIL 316 is required for the major and satisfies the Theme 2 requirement

## Major Requirements for the Bachelor of Science Degree in Engineering Sciences

- Lower Division** (30 units):  
ENGR 160, 161, 162, 207, 240, 241, 243, 244
- Upper Division Required** (35 units):  
ENGR 300, 301, 310, 320, 330, 401, 405, 490A, 490B, 490C
- Upper Division Electives** (23 units):  
ENGR 307, 340, 341, 342, 351, 410, 420, 422, 424, 426, 440, 441, 442, 452, 453, 454, 477
- Cognate Requirements** (52 units):  
MATH 201, 202, 203, or MATH 231, 232, 233, MATH 205 and PHYS 221, 222, CHEM 211, 211L, 212, 212L, PHIL 316, and a total of at least 5 units from the following list (Biosystems and Agricultural Engineering Emphasis students must take BIOL 100, 103, 201, 202, or 203): any BIOL or GEOL course, CHEM 213, 213L, MATH 204 or 234, 206, PHYS 223, 323A, 323B, 325

## Requirements for the Major in Engineering Sciences with Biosystems and Agricultural Engineering Emphasis

The Biosystems and Agricultural Emphasis is obtained by taking the courses required above for the BS degree in Engineering Sciences, but choosing the following 23 units of Upper Division electives:

- ENGR 340, 341, 342, 440, 441, 442
- In addition, students pursuing this emphasis must take one of the following courses: BIOL 100, 103, 201, 202, or 203
- In addition, students pursuing this emphasis are encouraged to undertake a design project related to biosystems and agricultural engineering, when available, in ENGR 490A, 490B and 490C
- Although not required for the emphasis, students are strongly advised to take ENGR 307 and 426

### **Requirements for the Major in Engineering Sciences with Engineering Management Emphasis**

The Engineering Management Emphasis is obtained by taking the courses required above for the BS degree in Engineering Sciences, but choosing the following Upper Division electives:

1. ENGR 420, 422, 424, 426
2. An additional 7 units of electives that apply towards the BS in Engineering Sciences

### **Requirements for the Major in Engineering Sciences with Petroleum Engineering Emphasis**

The Petroleum Engineering Emphasis is obtained by taking the courses required above for the BS degree in Engineering Sciences, but choosing the following 23 units of Upper Division electives:

1. ENGR 351, 426, 452, 453, 454
2. In addition, students pursuing this emphasis are encouraged to undertake a design project related to petroleum engineering, when available, in ENGR 490A, 490B and 490C

### **Information on General Education Courses**

- CSUB 101 Roadrunner RUSH-A seminar is required for entering Freshman
- Any of the required Physics courses (PHYS 221, 222) or CHEM 211, 211L, 212, 213L will satisfy Areas B1 and B3
- Area B2 is waived for Engineering Sciences majors
- Any of the required calculus courses (MATH 201, 202, 203, or MATH 231, 232, 233) will satisfy Area B4
- Area A3 is substituted by ENGR 207 for Engineering Sciences
- US History double-counts for Area C3
- Engineering Sciences majors are required to take only 10 units of Area D courses, 5 of which can be double-counted in American Institution by taking either PLSI 101 or PPA 275
- Theme 3 is waived for Engineering Sciences majors
- PHIL 316 Professional Ethics must be taken and will satisfy Theme 2
- EDTE 416 is a 3 unit course which satisfies the GRE requirement