Engineering Overview

Engineering involves the application of scientific and mathematical principles used in design and in the solution of practical technical problems. CRC's program provides the foundation in mathematics, physics, and engineering necessary to transfer to a university and complete a Bachelor of Science degree in Engineering. However, because the lower division requirements of universities vary, the student should check the transfer university's catalog to be sure he/she meets its specific requirements. See a CRC counselor for assistance.

Program Maps

Civil and Electrical / Computer, A.S. Degree (/crc/main/doc/programs/program-maps/engr-elec-comp-as-degree-ho.pdf)
Civil / Mechanical, A.S. Degree (/crc/main/doc/programs/program-maps/engr-civil-mech-as-degree-ho.pdf)

Associate Degrees

A.S. in Engineering - Civil/Mechanical Option

Pre-Professional Transfer Opportunities
CRC's program provides the foundation in mathematics, physics, and engineering necessary to transfer to a university and complete a bachelor's degree in engineering. Engineering involves the application of scientific and mathematical principles needed to solve practical technical problems. Although the first two years of engineering courses for all engineering degrees are similar, students should consult the lower division requirements of the institution to which they wish to transfer.

Highlights include:
* Challenging and rewarding classes that transfer to four-year universities
* A Mathematics, Engineering and Science Achievement (MESA) program

Note to Transfer Students:
If you are interested in transferring to a four-year college or university to pursue a bachelor's degree in this major, it is critical that you meet with a CRC counselor to select and plan the courses for your major. Schools vary widely in terms of the required preparation. The courses that CRC requires for an Associate's degree in this major may be different from the requirements needed for the Bachelor's degree.

When choosing whether to take the suggested electives, check university requirements; these courses may be required at some universities.

Catalog Date: June 1, 2020

Degree Requirements

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 400</td>
<td>General Chemistry I</td>
<td>5</td>
</tr>
<tr>
<td>CISP 360</td>
<td>Introduction to Structured Programming (4)</td>
<td>4</td>
</tr>
<tr>
<td>ENGR 400</td>
<td>Introduction to Electrical Circuits and Devices</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 312</td>
<td>Engineering Graphics</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 420</td>
<td>Statics</td>
<td>3</td>
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<tr>
<td>ENGR 412</td>
<td>Properties of Materials</td>
<td>4</td>
</tr>
<tr>
<td>MATH 401</td>
<td>Calculus I</td>
<td>5</td>
</tr>
<tr>
<td>MATH 402</td>
<td>Calculus II</td>
<td>5</td>
</tr>
<tr>
<td>MATH 420</td>
<td>Calculus III</td>
<td>5</td>
</tr>
<tr>
<td>PHYS 411</td>
<td>Mechanics of Solids and Fluids</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 421</td>
<td>Electricity and Magnetism</td>
<td>4</td>
</tr>
</tbody>
</table>

Total Units: 49

Check specific university requirements before choosing a course

The Engineering - Civil/Mechanical Option Associate in Science (A.S.) degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See CRC graduation requirements.

Career Information
Aerospace Engineer; Architectural Engineer; Chemical Engineer; Civil Engineer; Computer Engineer; Electrical Engineer; Mechanical Engineer, and other types of engineers. Most career options require a B.S. degree.

**A.S. in Engineering - Electrical/Computer Option**

Pre-Professional Transfer Opportunities

CRC’s program provides the foundation in mathematics, physics, and engineering necessary to transfer to a university and complete a bachelor's degree in engineering. Engineering involves the application of scientific and mathematical principles needed to solve practical technical problems. Although the first two years of engineering courses for all engineering degrees are similar, students should consult the lower division requirements of the institution to which they wish to transfer.

Highlights include:
- Challenging and rewarding classes that transfer to four-year universities
- A Mathematics, Engineering and Science Achievement (MESA) program

Note to Transfer Students:

If you are interested in transferring to a four-year college or university to pursue a bachelor's degree in this major, it is critical that you meet with a CRC counselor to select and plan the courses for your major. Schools vary widely in terms of the required preparation. The courses that CRC requires for an Associate's degree in this major may be different from the requirements needed for the Bachelor's degree. When choosing whether to take the suggested electives, check university requirements; these courses may be required at some universities.

**Catalog Date:** June 1, 2020

### Degree Requirements

**COURSE CODE** | **COURSE TITLE** | **UNITS**
--- | --- | ---
CHEM 400 | General Chemistry I | 5
CISP 360 | Introduction to Structured Programming (4) | 4
ENGR 400 | Introduction to Electrical Circuits and Devices | 3
MATH 400 | Calculus I | 5
MATH 401 | Calculus II | 5
MATH 420 | Differential Equations | 4
PHYS 411 | Mechanics of Solids and Fluids | 4
PHYS 421 | Electricity and Magnetism | 4

**Total Units:** 39

The Engineering - Electrical/Computer Option Associate in Science (A.S.) degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See CRC graduation requirements.

### Career Information

Aerospace Engineer; Architectural Engineer; Chemical Engineer; Civil Engineer; Computer Engineer; Electrical Engineer; Mechanical Engineer, and other types of engineers. Most career options require a B.S. degree.

**A.S. in General Science**

Areas of Study include:

- Physical Anthropology
- Astronomy
- Biology
- Chemistry
- Engineering
- Physical Geography
- Geology
- Physics

Eighteen (18) units of transfer level course work in science is required. Two laboratory courses must be included: one in the physical sciences and one in the biological sciences. Courses may be selected from astronomy, biology, chemistry, geology, physical geography, physical anthropology, and physics. The student, in consultation with a counselor, should choose science courses to meet his or her program, transfer, or general education requirements.

Students interested in transferring to a four-year university with a science major are encouraged to complete a science AS or AS-T degree such as Anthropology, Biology, Chemistry, Engineering, Geography, Geology, or Physics. This General Science degree may not include the majors-level transfer courses needed for many science majors. Students are strongly recommended to see a counselor for guidance.

**Catalog Date:** June 1, 2020

### Degree Requirements

**A. Life Science with Lab:**

A minimum of 4 units from the following:

- ANTH 300 Biological Anthropology (3)
- ANTH 301 Biological Anthropology Laboratory (1)
- BIOL 307 Biology of Organisms (4)
- BIOL 310 General Biology (4)
- BIOL 400 Principles of Biology (5)
- BIOL 410 Principles of Botany (5)
- BIOL 420 Principles of Zoology (5)
- BIOL 430 Anatomy and Physiology (5)
<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 431</td>
<td>Anatomy and Physiology (5)</td>
<td></td>
</tr>
<tr>
<td>BIOL 440</td>
<td>General Microbiology (4)</td>
<td></td>
</tr>
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</table>

**B. Physical Science with Lab:**

A minimum of 3 units from the following:

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
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</thead>
<tbody>
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<td>ASTR 400</td>
<td>Astronomy Laboratory (1)</td>
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<td>and ASTR 300</td>
<td>Introduction to Astronomy (3)</td>
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<tr>
<td>CHEM 300</td>
<td>Beginning Chemistry (4)</td>
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<tr>
<td>CHEM 305</td>
<td>Introduction to Chemistry (5)</td>
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<tr>
<td>CHEM 306</td>
<td>Introduction to Organic and Biological Chemistry (5)</td>
<td></td>
</tr>
<tr>
<td>CHEM 309</td>
<td>Integrated General, Organic, and Biological Chemistry (5)</td>
<td></td>
</tr>
<tr>
<td>CHEM 322</td>
<td>Environmental Chemistry Laboratory (1)</td>
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<tr>
<td>and CHEM 321</td>
<td>Environmental Chemistry (3)</td>
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</tr>
<tr>
<td>CHEM 400</td>
<td>General Chemistry I (5)</td>
<td></td>
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<tr>
<td>CHEM 401</td>
<td>General Chemistry II (5)</td>
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<tr>
<td>CHEM 420</td>
<td>Organic Chemistry I (5)</td>
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<tr>
<td>CHEM 421</td>
<td>Organic Chemistry II (5)</td>
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<tr>
<td>GEOG 301</td>
<td>Physical Geography Laboratory (1)</td>
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<tr>
<td>and GEOG 300</td>
<td>Physical Geography: Exploring Earth's Environmental Systems (3)</td>
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<tr>
<td>GEOL 301</td>
<td>Physical Geology Laboratory (1)</td>
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<tr>
<td>and GEOL 300</td>
<td>Physical Geology (3)</td>
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<tr>
<td>GEOL 306</td>
<td>Earth Science Laboratory (1)</td>
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<td>and GEOL 305</td>
<td>Earth Science (3)</td>
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<tr>
<td>GEOL 311</td>
<td>Historical Geology Laboratory (1)</td>
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<td>and GEOL 310</td>
<td>Historical Geology (3)</td>
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<tr>
<td>ENGR 304</td>
<td>How Things Work (3)</td>
<td></td>
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<tr>
<td>PHYS 350</td>
<td>General Physics (4)</td>
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<tr>
<td>PHYS 360</td>
<td>General Physics (4)</td>
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<tr>
<td>PHYS 370</td>
<td>Introductory Physics - Mechanics and Thermodynamics (5)</td>
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<td>PHYS 380</td>
<td>Introductory Physics - Electricity and Magnetism, Light and Modern Physics (5)</td>
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<tr>
<td>PHYS 411</td>
<td>Mechanics of Solids and Fluids (4)</td>
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<tr>
<td>PHYS 421</td>
<td>Electricity and Magnetism (4)</td>
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</tr>
<tr>
<td>PHYS 431</td>
<td>Heat, Waves, Light and Modern Physics (4)</td>
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</table>

**C. Additional Science Courses:**

A minimum of 11 units from the following:

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
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<tbody>
<tr>
<td>ANTH 300</td>
<td>Biological Anthropology (3)</td>
<td></td>
</tr>
<tr>
<td>ANTH 301</td>
<td>Biological Anthropology Laboratory (1)</td>
<td></td>
</tr>
<tr>
<td>ASTR 300</td>
<td>Introduction to Astronomy (3)</td>
<td></td>
</tr>
<tr>
<td>ASTR 400</td>
<td>Astronomy Laboratory (1)</td>
<td></td>
</tr>
<tr>
<td>BIOL 300</td>
<td>The Foundations of Biology (3)</td>
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<tr>
<td>BIOL 307</td>
<td>Biology of Organisms (4)</td>
<td></td>
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<tr>
<td>BIOL 310</td>
<td>General Biology (4)</td>
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<tr>
<td>BIOL 342</td>
<td>The New Plagues: New and Ancient Infectious Diseases Threatening World Health (3)</td>
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<tr>
<td>BIOL 350</td>
<td>Environmental Biology (3)</td>
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<tr>
<td>BIOL 352</td>
<td>Conservation Biology (3)</td>
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<tr>
<td>BIOL 390</td>
<td>Natural History Field Study (0.5 - 4)</td>
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<tr>
<td>BIOL 400</td>
<td>Principles of Biology (5)</td>
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<tr>
<td>BIOL 410</td>
<td>Principles of Botany (5)</td>
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<tr>
<td>BIOL 420</td>
<td>Principles of Zoology (5)</td>
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<td></td>
</tr>
<tr>
<td>BIOL 440</td>
<td>General Microbiology (4)</td>
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<tr>
<td>BIOL 462</td>
<td>Genetics in Contemporary Human Society (3)</td>
<td></td>
</tr>
<tr>
<td>CHEM 300</td>
<td>Beginning Chemistry (4)</td>
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<tr>
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<td>Physical Geography Laboratory (1)</td>
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</tr>
</tbody>
</table>
The General Science Associate in Science (A.S.) degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See CRC graduation requirements.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- explain the core perspectives of the scientific method and apply it to at least one scientific discipline. (SLO 1)
- solve introductory problems of a conceptual and/or numerical nature of at least one scientific discipline. (SLO 2)
- accurately apply the basic vocabulary and concepts of at least one scientific discipline verbally and in writing. (SLO 3)
- recognize the use and misuse of scientific concepts in society including politics and the media. (SLO 4)

Engineering (ENGR) Courses

ENGR 300 Introduction to Engineering

<table>
<thead>
<tr>
<th>Units:</th>
<th>1</th>
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</thead>
<tbody>
<tr>
<td>Hours:</td>
<td>18 hours LEC</td>
</tr>
<tr>
<td>Prerequisite:</td>
<td>None.</td>
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<tr>
<td>Transferable:</td>
<td>CSU; UC</td>
</tr>
<tr>
<td>Catalog Date:</td>
<td>June 1, 2020</td>
</tr>
</tbody>
</table>

This course will provide students with information to evaluate the engineering profession as a personal career choice. Students will explore the branches of engineering and the different types of work that engineers do. Participants will investigate personal characteristics which contribute to being happy and successful engineers, and will examine their own traits. They will learn what preparation is needed and strategies for successful completion. Course participants will appreciate the role of engineers in society and understand the responsibilities of engineers in their service to society.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO#1 – DESCRIBE ASPECTS OF ENGINEERING AS A PROFESSION
- describe different branches of engineering
- describe different types of work functions performed by engineers
- explain the responsibility of engineers to their clients
- SLO#2 – ASSESS ENGINEERING AS A SUITABLE PERSONAL CAREER CHOICE
- investigate personal characteristics which contribute to satisfaction and success in engineering and compare them to their own traits
- SLO#3 – UNDERSTAND THE REQUIREMENTS FOR BECOMING AN ENGINEER
- ascertain the requirements for different engineering majors at different universities
- create a personal education plan to become an engineer
- describe and perform behaviors that will support success in becoming an engineer

ENGR 304 How Things Work
This course covers how everyday things and technologies operate and is designed primarily for non-science students or anyone interested in learning about technology. The basic scientific principles behind the technology will be explored. Systems studied will include mechanical, electrical, thermal, optical and others. Students will gain hands-on experience with basic machines and technologies during lab.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- **APPLY THE SCIENTIFIC METHOD TO DEMONSTRATE HOW MODERN TECHNOLOGY WORKS AND IS DEVELOPED. (SLO 1)**
- Identify the scientific principles used in common engineering systems.
- CONSTRUCT A SCIENTIFIC ANALYSIS OF AN ENGINEERING SYSTEM THAT THE STUDENT ENCOUNTERS ROUTINELY. (SLO 2)
- Analyze a system and break it down into simpler components and explain how the components interface to create a desired result.
- Build basic machines or technologies and investigate hands-on how things function
- DEMONSTRATE AN INCREASED SCIENTIFIC AND TECHNICAL LITERACY, INCLUDING AN INCREASED TECHNICAL VOCABULARY. (SLO 3)
- Critique common scientific misconceptions regarding technology.
- SOLVE ENGINEERING PROBLEMS THAT REQUIRE CRITICAL THINKING TO COMPLETE. (SLO 4)

**ENGR 312 Engineering Graphics**

Upon completion of this course, the student will be able to:

- SLO#1 - CREATE AND USE TECHNICAL DRAWINGS USING TWO DIMENSIONAL COMPUTER SOFTWARE
  - Represent objects completely in fully dimensioned orthographic projections
  - Construct isometric drawings
  - Determine the true length, grade, and bearing of scaled features
  - Construct plan and profile drawings for civil engineering applications
  - Construct a set of working drawings
- SLO#2 - CREATE AND USE THREE DIMENSIONAL SOLID MODELS
  - Model individual parts
  - Make assembly models from parts
  - Create detail and assembly drawings from models
- SLO#3 - CREATE SIMPL ENGINEERING DESIGNS
  - Describe and perform the steps involved in engineering design
  - Create a solution to a simple design problem, culminating in working drawings

**ENGR 400 Introduction to Electrical Circuits and Devices**

Upon completion of this course, the student will be able to:

- SLO#1 - ANALYZE ELECTRIC CIRCUITS FOR DC, TRANSIENT, AND AC VOLTAGE AND CURRENT RESPONSES
  - Understand and apply various analysis techniques such as nodal analysis, loop analysis, superposition, source transformations, and Thevenin and Norton equivalents
  - Evaluate different analysis techniques and choose an appropriate technique for a particular circuit
  - In circuits with step functions applied, solve for transient, forced, and complete response

This course will provide engineering students with circuit analysis concepts and applications that will be of value in any engineering field as well as a solid foundation for electrical engineering and related majors. The course includes the analysis of circuits with resistors, inductors, capacitors, and independent and dependent voltage and current sources. Many analysis techniques will be applied to DC and AC circuits. Differential equations will be used to find the transient response of circuits. Power calculations will be performed on both DC and AC circuits, including an introduction to three-phase AC power. This course is required for most engineering bachelor's degrees.
use phasors and impedances to analyze AC circuits
SLO#2 - APPLY A SIMPLE MODEL FOR OPERATIONAL AMPLIFIERS TO SOLVE SIMPLE CIRCUITS
SLO#3 - USE MULTIMETERS, SIGNAL GENERATORS, AND OSCILLOSCOPES
SLO#4 - CALCULATE POWER IN DC AND AC CIRCUITS
perform conservation of power checks
apply the concepts of complex power to analyze AC circuits
analyze Y-Y connected balanced three phase circuits

ENGR 412 Properties of Materials

Units: 4
Hours: 54 hours LEC; 54 hours LAB
Prerequisite: CHEM 400 and PHYS 411 with grades of "C" or better
Transferable: CSU; UC
Catalog Date: June 1, 2020

This is an introductory course on the relationship of the internal structure of materials to their properties. Topics include crystalline structure, imperfections, phases and phase diagrams, steels and non-ferrous alloys, polymers, ceramics, semiconductors, and corrosion. Students will apply the concepts in laboratory activities and will use typical materials testing equipment and analysis techniques. This course is required for CRC's A.S.-Engineering, Civil/Mechanical Engineering option degree, and many university engineering B.S. degrees.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO1: RELATE THE PROPERTIES OF A MATERIAL TO ITS STRUCTURE ON A SUB-MICROSCOPIC SCALE.
- Construct models of crystalline structures and explain how the structure's characteristics affect a material's properties.
- Distinguish between the types of imperfections that occur in crystalline structures and compare their effects on a material's properties.
- Describe different strengthening mechanisms and compare their effects.
- Relate typical properties of polymers and ceramics to their molecular and crystalline or amorphous structures.
- Describe the mechanism for electrical conduction in metals and semiconductors.
- SLO2: INTERPRET BINARY PHASE DIAGRAMS.
- Perform analysis involving different compositions, temperature, and phases.
- Analyze eutectic and eutectoid reactions and the microconstituents that result.
- SLO3: CHARACTERIZE MATERIAL PROPERTIES.
- Perform tension, compression, and hardness tests, and interpret the results.
- SLO4: DESCRIPT, SPECIFY, AND COMPARE DIFFERENT PROCESSES FOR FORMING OR TRANSFORMING MATERIALS.
- Calculate rates of steady-state diffusion.
- Specify processes involving cold work and annealing that provide specified properties.
- Describe solidification processes and the microstructures that result when casting metals.
- Compare different thermal processes for strengthening steel and aluminum alloys, the microstructures that result, and their effect on strength.
- Mix, pour, and test concrete.
- Describe different forming processes for ceramics.
- SLO5: IDENTIFY AND DESCRIBE DIFFERENT FAILURE MECHANISMS AND APPROACHES TO PREVENTION.
- Identify and describe ductile and brittle fracture, fatigue, and creep.
- Differentiate between different corrosion mechanisms and choose appropriate ways to prevent corrosion.
- SLO6: CONDUCT LABORATORY INVESTIGATIONS AND EXHIBIT PROFESSIONALISM
- Produce and analyze data, discuss results, draw conclusions.
- Write well organized reports that demonstrate good technical writing skills and professional appearance.
- Demonstrate good practice and professional behavior (showing appropriate respect for people and equipment), including safety precautions, in lab work.
- Behave ethically in collaboration with others and in the use of assistance obtained outside the context of class.

ENGR 420 Statics

Units: 3
Hours: 54 hours LEC
Prerequisite: MATH 401 and PHYS 411 with grades of "C" or better
Transferable: CSU; UC
Catalog Date: June 1, 2020

This course covers analysis of two and three dimensional force systems for bodies in static equilibrium. Vector and scalar analysis methods address forces acting on rigid bodies, trusses, frames, and machines. Students will calculate internal forces in members and will create shear and bending moment diagrams for beams. Friction problems will include slipping vs tipping. Students will learn methods to calculate centroids and moments of inertia for bodies that are combinations of simple geometric shapes. This course is required for most engineering majors.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO#1 - REDUCE SYSTEMS OF FORCES TO ONE EQUIVALENT FORCE, OR ONE FORCE AND ONE COUPLE.
- Transform information describing forces in a variety of formats into Cartesian vectors
- Calculate moments of forces and couples using scalar and vector approaches
- SLO#2 - ANALYZE OBJECTS IN STATIC EQUILIBRIUM FOR EXTERNAL FORCES
- Characterize reactions at supports for two and three dimensional objects
- Draw free body diagrams for particles, rigid bodies, and members of frames and machines.
- Formulate and solve equilibrium equations for forces on particles, rigid bodies, and members of frames and machines in two and three dimensions.
- SLO#3 - Determine internal forces.
- Apply Method of Joints and Method of Sections to find forces in truss members.
- Determine axial, shear, and bending moment at specified points in rigid bodies.
- Produce explicit functions for shear and bending moment in beams.
- Construct shear and bending moment diagrams for beams.
- SLO#4 - Analyze systems that include dry friction.
- Solve for forces in problems that include impending motion, no impending motion, and slipping vs. tipping.
- SLO#5 - Determine geometrical properties of composite bodies.
- Calculate centroids for two and three dimensional composite bodies.
- Calculate moments of inertia for two and three dimensional composite bodies.

**ENGR 495 Independent Studies in Engineering**

**Units:** 1 - 3  
**Hours:** 54 - 162 hours LAB  
**Prerequisite:** None.  
**Transferable:** CSU  
**Catalog Date:** June 1, 2020

An independent studies project involves an individual student or small group of students in study, research, or activities beyond the scope of regularly offered courses. See the current catalog section of "Special Studies" for full details of Independent Studies.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- SLO #1: Actively engage in intellectual inquiry beyond that required in order to pass a course of study (College Wide Learning Outcome – Area 4).
- Discuss and outline a proposal of study (that can be accomplished within one semester term) with a supervising instructor qualified within the discipline.
- Design an independent study (to be completed individually or by collaboration of a small group) to foster special knowledge, skills, and experience that are not available in any one regularly scheduled course.
- Use information resources to gather discipline-specific information.
- SLO #2: Utilize modes of analysis and critical thinking to apply theoretical perspectives and/or concepts in the major discipline of study to significant problems and/or educational activities (College Wide Learning Outcome – Area 3).
- Analyze and apply the knowledge, skills and experience that are involved in the independent study to theoretical perspectives and/or concepts in the major discipline of study.
- Explain the importance of the major discipline of study in the broader picture of society.
- SLO #3: Communicate a complex understanding of content matter of the major discipline of study (College Wide Outcome – Area 3).
- Demonstrate competence in the skills essential to mastery of the major discipline of study that are necessary to accomplish the independent study.
- SLO #4: Identify personal goals and pursue these goals effectively (College Wide Outcome – Area 4).
- Utilize skills from the "academic tool kit" including time management, study skills, etc., to accomplish the independent study within one semester term.

**ENGR 498 Work Experience in Engineering**

**Units:** 1 - 4  
**Hours:** 60 - 300 hours LAB  
**Prerequisite:** None.  
**Enrollment Limitation:** Students must be in a paid or unpaid internship, volunteer position or job related to career goals in Engineering.

This course provides students with opportunities to develop marketable skills in preparation for employment in their major field of study or advancement within their career. It is designed for students interested in work experience and/or internships in transfer level degree occupational programs. Course content includes understanding the application of education to the workforce; completion of required forms which document the student's progress and hours spent at the work site; and developing workplace skills and competencies. Appropriate level learning objectives are established by the student and the employer. During the semester, the student is required to participate in a weekly orientation and 75 hours of related paid work experience, or 60 hours of unpaid work experience for one unit. An additional 75 or 60 hours of related work experience is required for each additional unit. Work Experience may be taken for a total of 16 units when there are new or expanded learning objectives. Only one Work Experience course may be taken per semester.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- DEMONSTRATE AN UNDERSTANDING AND APPLICATION OF PROFESSIONAL WORKPLACE BEHAVIOR IN A FIELD OF STUDY RELATED ONE'S CAREER.(SLO 1)
- Understand the effects time, stress, and organizational management have on performance.
- Demonstrate an understanding of consistently practicing ethics and confidentiality in a workplace.
- Examine the career/life planning process and relate its relevancy to the student.
- Demonstrate an understanding of basic communication tools and their appropriate use.
- Demonstrate an understanding of workplace etiquette.
- DESCRIBE THE CAREER/LIFE PLANNING PROCESS AND RELATE ITS RELEVANCY TO ONE'S CAREER.(SLO 2)
- Link personal goals to long term achievement.
- Display an understanding of creating a professional first impression.
- Understand how networking is a powerful job search tool.
- Understand necessary elements of a résumé.
Understand the importance of interview preparation.
Identify how continual learning increases career success.

DEMONSTRATE APPLICATION OF INDUSTRY KNOWLEDGE AND THEORETICAL CONCEPTS AS WRITTEN IN LEARNING OBJECTIVES IN PARTNERSHIP WITH THE EMPLOYER WORK SITE SUPERVISOR.
(SLO 3)

ENGR 499 Experimental Offering in Engineering

Units: 0.5 - 4
Prerequisite: None.
Transferable: CSU; UC (Credit for variable topics courses is given only after a review of the scope and content of the course by the enrolling UC campus)
Catalog Date: June 1, 2020

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