

Area: Science and Engineering
 Dean: Dr. Rina Roy
 Phone: (916) 484-8107
 Counseling: (916) 484-8572

ARC's program provides the foundation in mathematics, physics, and engineering necessary to transfer to a four-year institution and complete a bachelor's degree in engineering.

Most lower division engineering programs require the following ARC courses: Mathematics 400, 401, 402, 420; Physics 410, 421, 431; Chemistry 400; Engineering 401, 413, 420. Students should consult the institution to which they wish to transfer for specific lower division requirements.

Engineering

ENGR 300 Introduction to Engineering 1 Unit

Advisory: ENGWR 102 and ENGRD 116 with a grade of "C" or better, OR ESLL 320 and ESLR 320 and ESLW 320 with a grade of "C" or better.
Course Transferable to UC/CSU
Hours: 18 hours LEC

This course is an introduction to the engineering and engineering technology professions, and their place in industry. It includes an explanation of the engineering and engineering technology options and curricula involved. Topics include an emphasis on problem-solving techniques used in engineering and engineering technology. This course is recommended for all entering engineering, engineering technology and design technology students.

ENGR 305 Basic Technical Drawing 3 Units

Advisory: ENGWR 102 and ENGRD 116 with a grade of "C" or better; OR ESLL 320 and ESLR 320 and ESLW 320 with a grade of "C" or better.
Course Transferable to CSU
Hours: 36 hours LEC; 72 hours LAB

This course introduces the graphical tools and instruments used to generate, analyze and interpret engineering drawings. Topics include lettering, geometric construction, or orthographic projection, auxiliary drawings, sectioning, and dimensioning.

ENGR 307 Industrial Materials Testing 3 Units

Prerequisite: MATH 100 or 104 with a grade of "C" or better; or placement through the assessment process.
Advisory: MATH 120, 124, or 129
Course Transferable to CSU
Hours: 54 hours LEC; 36 hours LAB

This course covers the basic properties of materials used in industry. The course emphasizes the practical use of the materials, but uses sufficient theory to understand these applications well. The course covers metals, concretes, plastics, ceramics, glasses, wood, and other composites. This course is primarily intended for design technology, engineering technicians and other technical students.

ENGR 310 Engineering Survey Measurements 4 Units

Prerequisite: MATH 330 with a grade of "C" or better
Advisory: ENGWR 102 and ENGRD 116 with a grade of "C" or better, OR ESLR 320 and ESLW 320 with a grade of "C" or better
Course Transferable to UC/CSU
Hours: 54 hours LEC; 54 hours LAB

This course covers the basic fundamentals of surveying for engineers. Electronic surveying instruments are used to develop the principles of measurement for distance, elevations and angles. Additional topics include systematic and random errors, line directions, profiles and cross sections, traverse computations, horizontal and vertical curves, and earthquake quantity calculations. This course is intended for civil engineers, but may also be required for other programs.

ENGR 312 Engineering Graphics 3 Units

Prerequisite: ENGR 305 with a grade of "C" or better
Course Transferable to UC/CSU
Hours: 36 hours LEC; 72 hours LAB

This course applies the graphical tools needed to analyze, interpret, and solve engineering problems. The engineering design process is taught using manual and introductory interactive computer-aided design and drafting (CADD) tools to solve typical three-dimensional engineering problems. Topics include descriptive geometry, vector graphics, orthogonal projection, and primary and secondary auxiliary views. This course is intended for mechanical and civil engineering majors, but may also be required for other programs.

ENGR 320 Manufacturing Processes 3 Units

Course Transferable to UC/CSU
Hours: 36 hours LEC; 54 hours LAB

This course covers the principles of manufacturing processes in the areas of material removal, forming, joining and casting, and the fundamentals of numerical control. Topics include the application of equipment such as lathes, milling machines, drill press machines, saws, grinders, welders, molding equipment, and core makers. It includes hands-on experience in welding and machinery operation.

ENGR 401 Introduction to Electrical Circuits and Devices 3.5 Units

Prerequisite: PHYS 421 with a grade of "C" or better
Corequisite: MATH 420
Course Transferable to UC/CSU
Hours: 54 hours LEC; 36 hours LAB

This course covers the fundamentals of electrical circuit theory and analysis for engineers. Topics include time domain circuit analysis techniques, circuit reduction techniques, frequency domain circuit analysis, first- and second-order circuits with natural and step responses, and operational amplifiers. This course provides a solid foundation for upper division engineering courses.

ENGR 413 Properties of Materials 4.5 Units

Prerequisite: CHEM 400 and PHYS 410 with grades of "C" or better
Advisory: ENGWR 102 and ENGRD 116 with a grade of "C" or better, OR ESLL 320 and ESLR 320 and ESLW 320 with a grade of "C" or better.

Course Transferable to UC/CSU

Hours: 72 hours LEC; 27 hours LAB

This is an introductory course in the properties of materials used in engineering. This course places emphasis upon the theory underlying the behavior of engineering materials. It includes a laboratory component, which covers the testing of metals, polymers, composites, wood, and other materials.

ENGR 420 Statics 3 Units

Prerequisite: MATH 401 and PHYS 410 with grades of "C" or better

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course covers the study of bodies in equilibrium with emphasis on force systems, structures, distributed loads, friction and virtual work. In this course, analytical rather than graphical methods of problem solving are emphasized.

ENGR 430 Dynamics 3 Units

Prerequisite: ENGR 420 and MATH 402 with grades of "C" or better

Advisory: MATH 420

Course Transferable to UC/CSU

Hours: 54 hours LEC

This course covers the basic fundamentals of dynamics for engineers. Topics include kinematics and kinetics of particles; systems of particles and rigid bodies; systems with fixed and rotating axes; and the equations of motion, energy, and momentum.