

Engineering

Associate in Science

Minimum of 62-64 credit hours

Engineering students learn about fundamental engineering principles and how they are applied to real life problems. At Oklahoma City Community College, the Engineering Program is designed especially for students who want to complete a bachelor's or advanced degree in any of the various branches of engineering. Courses cover subjects such as Engineering Graphics and Design, Statics, Dynamics, Strength of Materials, Thermodynamics, Electrical Science, Fluid Mechanics and Programming. Students in engineering are often interested in chemistry, physics, mathematics, technology, computers and electronics. Degrees in engineering prepare students to continue studies at a four-year college or university. Once students graduate, they find career opportunities with industry or government in any of more than 30 branches of engineering.

Course Sequence

Course ID	Course Name	Credits	Type	Min Gd
Suggested Freshman 1st Semester				
SCL 1001	Success in College and Life	1	Life Skills	
MATH 2104	Calculus and Analytic Geometry I	4	Gen Ed	C
CHEM 1115	General Chemistry I	OR	Support	C
CHEM 1415	Chemistry for Engineers	5	Support	C
ENGL 1113	English Composition I	3	Gen Ed	
ENGR 1113	Introduction to Engineering	3	Major	C
Suggested Freshman 2nd Semester				
MATH 2214	Calculus and Analytic Geometry II	4	Gen Ed	C
ENGL 1213	English Composition II	3	Gen Ed	
PHYS 2014	Engineering Physics I	4	Gen Ed	C
HUM	Humanities Elective	3	Gen Ed	
Suggested Sophomore 1st Semester				
MATH 2314	Calculus and Analytic Geometry III	4	Support	C
HIST 1483	U.S. History to The Civil War	OR	Gen Ed	
HIST 1493	U.S. History Since The Civil War	3	Gen Ed	
PHYS 2114	Engineering Physics II	4	Gen Ed	C
ENGR 2133	Rigid Body Mechanics	OR	Major	C
ENGR 2243	Statics	3	Major	C
SOC 1113	Introduction to Sociology	OR	Gen Ed	
PSY 1113	Introduction to Psychology	3	Gen Ed	
Suggested Sophomore 2nd Semester				
POLSC 1113	American Federal Government	3	Gen Ed	
ENGR MAJ ELEC	Engineering Major Electives	6	Major	C
ENGR SUPP ELEC	Engineering Support Electives	3-5	Support	C
HUM	Humanities Elective	3	Gen Ed	

Course Grouping

Major Courses: (12-credit hours) Engineering: (C)ENGR 1113; (C)ENGR 2133* or (C)ENGR 2243*; and six hours of approved major electives selected from (C) ENGR 1000; (C) ENGR 2103; (C) ENGR 2143; (C) ENGR 2200; (C) ENGR 2303; (C) ENGR 2313; (C) ENGR 2333; (C) ENGR 2343; (C) ENGR 2523; or (C) ENGR 2613.

General Education Courses: (37 credit hours) English: ENGL 1113; ENGL 1213; History: HIST 1483 or HIST 1493; Political Science: POLSC 1113; Physics: (C) PHYS 2014; (C) PHYS 2114; Mathematics: (C) MATH 2104, (C) MATH 2214; *Humanities: Six credit hours; Social Sciences: *SOC 1113 or *PSY 1113.

Life Skills Courses: (1 credit hour) Life Skills: SCL 1001

Support Courses: (12-14 credit hours) Mathematics: (C) MATH 2314; (C) CHEM 1115 OR (C) CHEM 1415; and three to five hours of approved support hours selected from:(C) GEOL 1114; (C) PHYS 2223; (C) MATH 2013; (C) MATH 2413; (C) CAT 1214; (C) CS 1143; (C) CS 2163; (C) CS 2363; (C) CHEM 1215; (C) CHEM 2114; (C) CHEM 2122; (C) CHEM 2124; (C) ENGR 2103; (C) ENGR 2143; (C) ENGR 2313; (C) ENGR 2333; (C) ENGR 2343; (C) ENGR 2523 or (C) ENGR 2613.

*Should Select Course Appropriate to the Student's Transfer Institution and Major

Program Notes

Notes: This program is designed for students planning to continue their education at a four-year college or university. See the front general section for information and requirements about University Parallel/Transfer Programs.

Degree Program Course Descriptions

CHEM 1115 - General Chemistry I

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures; MATH 1513 or MATH 1533, or both MATH 0403 and High School Chemistry or CHEM 1123. A grade of 5 Credits This course is designed for science and engineering majors. The course covers nomenclature, atomic and molecular structure, stoichiometry, acid/base and other aqueous reactions, states of matter, phase changes, gas laws, and an introduction to thermochemistry. Laboratory experience is an integral part of the course.

CHEM 1415 - Chemistry for Engineers

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures; MATH 1513 or MATH 1533 with a "C" or better or placement in MATH 1613 or above; high school chemistry is strongly recommended. Enrollment is restricted to pre-engineering majors. 5 Credits This course is designed for engineering majors that require only a single semester of chemistry. It covers chemical principles relevant for engineers including the electronic structure of atoms and molecules; reactions and stoichiometry; the properties of solids, liquids, and gases; solutions; acids and bases; thermochemistry; electrochemistry; kinetics; and equilibrium. Laboratory is an integral part of the course. This course cannot be used as a prerequisite for CHEM 1215.

ENGL 1113 - English Composition I

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures 3 Credits The student will write well-developed compositions which demonstrate the principles of unity, coherence, and organization and which contain specific details and vivid language. The students will locate library material and incorporate researched materials into compositions.

ENGL 1213 - English Composition II

Prerequisites: ENGL 1103 or ENGL 1113 taken within the last year, with strong encouragement for immediate continuation. 3 Credits In this advanced writing course, students will create essays that explore and evaluate a variety of issues and perspectives suggested by fiction, poetry, drama, essays, and other types of cultural texts. Students will refine and augment the writing techniques they learned in ENGL 1113 or ENGL 1103 to develop well-reasoned, well-structured arguments in a clear, fluid, and engaging prose style.

ENGR 1113 - Introduction to Engineering

Prerequisites: MATH 1613 with a grade of "C" or better 3 Credits The student will demonstrate familiarity with basic methods and techniques of engineering by recording, analyzing, and presenting solutions in writing to a variety of engineering problems. The student will utilize (1) the engineering language including terminology and graphing/ and (2) computational techniques based on the calculator, the computer, and dimensional analysis. This course satisfies the computer proficiency requirement.

ENGR 2133 - Rigid Body Mechanics

Prerequisites: PHYS 2014 with a grade of "C" or better 3 Credits The student will solve problems related to static equilibrium of rigid and deformable bodies and the motion of particles and rigid bodies. Kinetics and kinematics will be studied with the application of algebra, trigonometry, scalar and vector calculus.

ENGR 2243 - Statics

Prerequisites: PHYS 2014 with a grade of "C" or better 3 Credits Students solve problems related to static equilibrium of particles and rigid bodies under the action of forces. Physical concepts of equilibrium and engineering applications are integrated with mathematical subjects of vector calculus, vector algebra and simultaneous algebraic equations. Note: OU Petroleum Engineering students should take ENGR 2133 Rigid Body Mechanics.

ENGR MAJ ELEC - Engineering Major Electives

6 Credits 6 hours of approved major electives selective from: (C) ENGR 1000; (C) ENGR 2103; (C) ENGR 2143; (C) ENGR 2200; (C) ENGR 2303; (C) ENGR 2313; (C) ENGR 2333; (C) ENGR 2343; (C) ENGR 2523; or (C) ENGR 2613.

ENGR SUPP ELEC - Engineering Support Electives

3-5 Credits 3-5 hours of approved support electives selected from: (C) GEOL 1114; (C) PHYS 2223; (C) MATH 2013; (C) MATH 2413; (C) CAT 1214; (C) CS 1143; (C) CS 2163; (C) CS 2363; (C) CHEM 1215; (C) CHEM 2114; (C) CHEM 2122; (C) CHEM 2124; (C) ENGR 2103; (C) ENGR 2143; (C) ENGR 2313; (C) ENGR 2333; (C) ENGR 2343; (C) ENGR 2523 or (C) ENGR 2613.

HIST 1483 - U.S. History to The Civil War

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures

3 Credits After analyzing events in American history from 1400 to 1877 in such areas as revolution, geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns of present day mobility, describe governmental operations in their society and help resolve conflict in society based on the student's search for change, precedents, and conflict in the American past. A general education requirement.

HIST 1493 - U.S. History Since The Civil War

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures

3 Credits After analyzing events in American history from 1870 to the present in such areas as political reform, industrialization, urbanization, ethnic acculturation and war, the student will be able to identify meaningful changes in his society, identify equal rights in that society, and help resolve conflict in this society based on the students search for change, equal rights and conflicts in the American past.

HUM - Humanities Elective

3 Credits Humanities elective

MATH 2104 - Calculus and Analytic Geometry I

Prerequisites: MATH 1533 and MATH 1613 or adequate math placement test score. 4 Credits The student will compute, interpret, and apply the basic concepts of limits, differentiation, and integration to algebraic and transcendental functions and will solve applied problems that include rates of change, optimization, area, and total change in a function. This course satisfies the computer proficiency requirement.

MATH 2214 - Calculus and Analytic Geometry II

Prerequisites: MATH 2104 within the last year. 4 Credits The student will use integration techniques to find antiderivatives, use integrals to solve problems from geometry and physics, use vectors to solve problems in higher dimensions, test infinite series for convergence, approximate functions by using series, solve elementary first-order differential equations, and analyze functions of three variables and their contour plots.

MATH 2314 - Calculus and Analytic Geometry III

Prerequisites: MATH 2214 within the last year.

4 Credits The student will compute partial derivatives, gradients, differentials, double and triple integrals in rectangular, cylindrical and spherical coordinate systems, curl and divergence of a vector field, and path and surface integrals of vector fields directly and by applying Green's Theorem, Stokes' Theorem and the Divergence Theorem; write parameterizations for lines, curves and surfaces; and solve application problems that include optimization, work and flows of vector fields This course satisfies the computer proficiency requirement.

PHYS 2014 - Engineering Physics I

Prerequisites: MATH 2104 (or at least 4 hours of calculus) within the last year or by evaluation. Prerequisite or Corequisite: MATH 2214

4 Credits This is a physics course designed primarily for pre-engineering, chemistry and physics majors. Students will demonstrate their understanding of concepts in mechanics, heat and sound by (1) developing qualitative and quantitative descriptions of physical phenomena, and (2) predicting the results of physical occurrences based on physics theory and laboratory experiments. Quantitative descriptions and predictions will incorporate methods of calculus where appropriate.

PHYS 2114 - Engineering Physics II

Prerequisites: PHYS 2014 and MATH 2214 (or at least 8 hours of calculus) within the last year or by evaluation. Prerequisite or Corequisite: MATH 2314

4 Credits This course is a continuation of Engineering Physics I. Students will demonstrate their understanding of concepts in electricity, magnetism, and light by (1) developing qualitative and quantitative descriptions of physical phenomena, and (2) predicting the results of physical occurrences based on physics theory and laboratory experiments. Quantitative descriptions and predictions will incorporate methods of calculus where appropriate.

POLSC 1113 - American Federal Government

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures

3 Credits A study of the principles, structure, processes and functions of the United States federal government.

PSY 1113 - Introduction to Psychology

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures

3 Credits A survey of the major areas of study in psychology such as motivation, learning, physiology, personality, social psychology, abnormal behavior, perception, memory, cognition/thought, and treatment.

SCL 1001 - Success in College and Life

Prerequisites: ENGL 0106 or adequate reading/writing assessment scores

1 Credit Students will learn best practices for academic, career, and personal success. Students will discover their individual strengths, interests, and values to create a personalized plan; select and utilize resources that are applicable to their growth and success; and engage as active and responsible members of the academic community. This course should be taken during a student's first semester of college work at Oklahoma City Community College and is a required course in degree plans to satisfy the Life Skills requirement.

SOC 1113 - Introduction to Sociology

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures

3 Credits The student will identify the sociological dimensions of human behavior by analyzing the concepts of society, culture, socialization, institutions, social stratification and social change.