

# CHEMICAL ENGINEERING (CHEN)

---

**CHEN 1201** Engineering as a Career **2 SCH (1-3)**

Introduction to chemical engineering and its role in society. Chemical engineering skills, tools and techniques applied to problem solving and academic and professional survival strategies. Introduction to conservation principles, transport phenomena, design and ethics. Includes a writing component as well as use of computers (spreadsheets, tables, graphing and simulations). For students planning to pursue a career in chemical engineering.

Fee: \$5.00

**CHEN 1301** Engineering as a Career **3 SCH (3)**

Principles of student success in college. Chemical engineering as an academic and professional career. Conversion of problem data to a unified unit system for problem solution.

**CHEN 2371** Conservation Principles I **3 SCH (3)**

Applications of the conservation laws of mass to the solution of chemical engineering problems. Prerequisites: CHEM 1312 or PHYS 2325/2125.

**CHEN 2372** Conservation Principles II **3 SCH (3)**

Applications of the conservation laws of energy to the solution of chemical engineering problems. Prerequisite: CHEN 2371.

**CHEN 3310** Heat Transport Phenomena **3 SCH (3)**

Fundamentals of energy transport and system applications involving this operation including computer applications to heat exchanger design.

Prerequisites: CHEM 3323/3123, CHEM 3392, and CHEM 3347 or MEEN 3347.

**CHEN 3315** Chemical Process Design I **3 SCH (3)**

Basic principles and techniques of economic analysis and cost engineering with applications to problems in chemical process and equipment design.

Prerequisites: CHEN 2371 and credit for or registration in CHEM 3310.

**CHEN 3321** Process Simulation **3 SCH (3)**

Basic numerical methods used in chemical process simulation. An introduction to the use of commercial process simulators, with hands-on applications. Prerequisite: MATH 3320. Corequisite: CHEN 3371.

**CHEN 3347** Chem Eng Thermodynamics I **3 SCH (3)**

Theory and applications of the first and second laws of thermodynamics to mechanical, chemical, magnetic and electrical interactions for both reversible and irreversible processes. Prerequisite: MATH 2414. Corequisite: PHYS 2326/2126.

**CHEN 3371** Chemical Thermodynamics II **3 SCH (3)**

Procedures for deciding when and to what extent chemical reactions and phase changes may be expected to occur according to the basic principles of physical chemistry and the laws of thermodynamics. Application of computers to advanced thermodynamic problems. Prerequisites: CHEM 3331, CHEM 3325/3125 and CHEM 3347.

**CHEN 3392** Fluid Transport Phenomena **3 SCH (3)**

Fundamentals of momentum transport, including fluid statics, flow of compressible and incompressible fluids, pumps, turbines, and compressors, with computer applications. Prerequisites: MATH 3320 and credit or registration in MEEN 2302 or MEEN 2355.

**CHEN 4120** Seminar in CHEN **1 SCH (1)**

Seminar on contemporary issues in Chemical Engineering. Prerequisite: junior standing.

**CHEN 4130** Service Learning in CHEN **1 SCH (1)**

Service learning experience in a project that engages a community agency and raises awareness of chemical engineering professional issues.

Prerequisite: junior standing.

**CHEN 4278** Unit Operations **2 SCH (6)**

Selected laboratory experiments on fluid flow and heat transfer. Prerequisite: CHEN 3310. Laboratory fee, \$5.

Fee: \$5.00

**CHEN 4279** Unit Operations Lab **2 SCH (6)**

Selected laboratory experiments on heat and mass transfer. Prerequisite: CHEN 4378 and CHEN 4389.

Fee: \$5.00

**CHEN 4311** Biochemical Engineering **3 SCH (3)**

Principles involved in the processing of biological materials using biological agents such as cells, enzymes or antibodies. Prerequisites: BIOL 1306, CHEM 3323/3123, and CHEM 3331.

**CHEN 4316** Chemical Process Design II **3 SCH (3)**

The application of chemical engineering principles to a sequence of design problems utilizing computer software, such as SIMSCI. Prerequisites: CHEN 3315, CHEN 3371 and CHEN 3310.

**CHEN 4317** Chem Process Design III (WI) **3 SCH (3)**

The application of chemical engineering principles, including economic criteria to a comprehensive design problem. Computer software is utilized as a design aid. Prerequisites: CHEN 4316, CHEN 4373, CHEN 4389 and credit for or registration in CHEN 4392.

**CHEN 4335 Special Problems 1-3 SCH (1-3)**

Individual solution of selected problems in chemical engineering conducted under direct supervision of a faculty member. May be repeated for up to six hours. Prerequisite: senior standing.

**CHEN 4373 Chemical Reactor Engineering 3 SCH (3)**

Chemical reaction rates and design of chemical reactors. Applications of computers to chemical kinetics and the design of chemical reactors. Prerequisites: CHEN 3371, CHEN 3310 and CHEM 3332.

**CHEN 4383 Natural Gas Process 3 SCH (3)**

The design, operation and economics of systems for the utilization of hydrocarbon gases and liquids, the concentration of their components by absorption and fractionation procedures. Use of computer aided design and economic evaluation of facility designs. Prerequisites: CHEN 4389.

**CHEN 4386 Air Pollution Control 3 SCH (3)**

A fundamental approach to air pollution testing, control and design of control systems. Introduction to dispersion modeling via computer. Prerequisite: CHEN 3392 and senior standing.

**CHEN 4389 Mass Transport Phenomena 3 SCH (3)**

Fundamentals of mass transport, including gas absorption, extraction, membrane separation, binary and multicomponent distillation, with computer design applications. Prerequisites: CHEM 3331, CHEN 3371 and credit or registration in CHEN 3310.

**CHEN 4392 Process Dynamics and Control 3 SCH (2-3)**

Basic operating theory of control instruments and their application to industrial chemical process. Applications of computers to process control. Prerequisites: CHEN 4373 and CHEN 4389.

Fee: \$5.00

**CHEN 4399 Internship in CHEN 1-3 SCH (1-3)**

Internships in industry, government, or consulting companies in career-based practical activities to broaden the skills obtained through curricular education. Prerequisite: junior standing.