

Chemical Engineering (CHEN)

CHEN 5303 Adv Topics in Chemical Engng **1-3 SCH (1-3)**

One or more advanced topics. May be repeated for a maximum of six SCH when topic changes.

CHEN 5305 Graduate Research Project **3 SCH (3)**

Designed for project option students. Requires successful completion of an assigned research project topic. May be repeated for a maximum of six SCH. Project advisor approval and enrollment in final 3 SCH of required course work, or completion of all required course work. Minimum GPA of 3.0.

CHEN 5306 Graduate Thesis Research **3 SCH (3)**

Designed for thesis option students. Requires successful completion of a thesis research proposal and final thesis. May be repeated for maximum of 6 semester hours. Thesis advisor approval and completion of 24 SCH of course work with a minimum GPA of 3.5.

CHEN 5308 Transport Phenomena **3 SCH (3-0)**

An advanced and unified treatment of fluid mechanics, heat transfer, and mass transfer based upon the fundamental equations of mass, momentum, energy and species transport with applications in chemical engineering and related fields.

CHEN 5309 Separation Process **3 SCH (3-0)**

Advanced treatment of the theory and methods associated with the solution, behavior and computation of both staged and continuous separation processes. Prerequisite: CHEN 4389 or equivalent. (Credit may not be obtained in both CHEN 5309 and NGEN 5309.)

CHEN 5325 Math Methods in Chemical Eng **3 SCH (3-0)**

Introduction to the formulation of advanced mathematical models in terms of differential and algebraic equations and the mathematical methods needed to obtain generate analytical and/or numerical solutions. Modeling aspects will focus on the macroscopic and microscopic transport laws and conservation principles that occur in the modern practice of chemical engineering and related fields. The mathematical methods will cover those commonly used for solution of the resulting linear, non-linear differential or differential/algebraic modeling equations. The efficient utilization of modern software tools to generate analytical and numerical solutions, such as MAPLE and MATLAB, will also be taught. Prerequisites: MATH 3320.

CHEN 5331 Simulation & Anal of Chem Eng **3 SCH (3-0)**

Analytical and numerical techniques for the simulation and analysis of processes and equipment employed in the chemical, biochemical, environmental and petroleum refining industries. Prerequisite: CHEN 4317 or equivalent.

CHEN 5333 Advanced Chemical Reactor Engr **3 SCH (3-0)**

Complex chemical kinetics, transport phenomena, and mathematical modeling for design, analysis, and optimization of industrial-scale reactors. Application of advanced computational methods to complex kinetics and the advanced design of chemical reactors.

CHEN 5334 Biochemical Reaction Engng **3 SCH (3-0)**

Kinetics of microbial growth and enzyme-catalyzed reactions and the analysis of kinetic-transport interactions in biochemical reactors, including their influence on the design, scale-up and performance of biochemical reactor systems.

CHEN 5336 Polymer Rheology **3 SCH (3-0)**

The study of non-Newtonian fluid flow behavior, including both theoretical and practical aspects of non-Newtonian fluid flows and their applications. Prerequisite: CHEN 5308. (Credit may not be obtained in both CHEN 5336 and NGEN 5336.)

CHEN 5360 Adv Chem & Natural Gas Proc **3 SCH (3-0)**

Study of key processes that are utilized in the chemical & natural gas industry, including analysis, design methods and optimization with a consideration of process economics, environmental and safety aspects. (Credit may not be obtained in both CHEN 5360 and NGEN 5360.)

CHEN 5361 Adv Proc Dynamics & Control **3 SCH (3-0)**

Fundamentals of modern process control theory with applications in the chemical, biochemical and petroleum refining industries. Prerequisite: CHEN 4392 or equivalent.

CHEN 5371 Adv Chem Eng Thermodynamics **3 SCH (3-0)**

Advanced treatment of the thermodynamics of multicomponent and multiphase fluid systems, with application to phase equilibria and chemical reaction equilibria. Prerequisite: CHEN 3371 or equivalent.

CHEN 5401 Advance Probs in Chem Eng **1-4 SCH (1-4)**

Individual or group research on advanced problems in chemical engineering conducted under the supervision of a faculty member. Maximum of 8 SCH allowed. Completion of 15 SCH of the required core courses and 6 SCH of electives with a minimum GPA of 3.25.

CHEN 6306 Proposal/Dissertation Research **1-9 SCH (0-0-1-9)**

This course is for doctoral students undertaking dissertation research to take towards fulfilling doctoral dissertation proposal and dissertation requirements.