

Chemical Engineering (CHEG)

Courses

CHEG 4813. Chemical Process Safety. 3 Hours.

Application of chemical engineering principles to the study of safety, health, and loss prevention. Fires and explosions, hygiene, toxicology, hazard identification, and risk assessment in the chemical process industries. Corequisite: Drill component. Prerequisite: CHEG 3144 and CHEG 3323.

CHEG 5013. Membrane Separation and System Design. 3 Hours.

Theory and system design of cross flow membrane process--reverse osmosis, nanofiltration, ultrafiltration, and microfiltration--and applications for pollution control, water treatment, food and pharmaceutical processing.

CHEG 5033. Technical Administration. 3 Hours.

Contemporary issues affecting the domestic and global Chemical Process Industries (CPI). Emphasis is on process economics, market and corporate strategy as well as advances in technology to improve corporate earnings while addressing the threats and opportunities in the CPI. Prerequisite: Senior or graduate standing.

CHEG 5043. Colloid and Interface Science. 3 Hours.

This course aims to provide essential knowledge about surface, interface, and molecular self-organization. At the end of this course students should understand (i) basic concepts to describe phenomena at surfaces, (ii) molecular self-organization, and (iii) basic techniques for characterization of surfaces and interfaces.

CHEG 5113. Transport Processes I. 3 Hours.

Fundamental concepts and laws governing the transfer of momentum, mass, and heat.

CHEG 5133. Advanced Reactor Design. 3 Hours.

Applied reaction kinetics with emphasis on the design of heterogeneous reacting systems including solid surface catalysis, enzyme catalysis, and transport phenomena effects. Various types of industrial reactors, such as packed bed, fluidized beds, and other non-ideal flow systems are considered.

CHEG 5213. Advanced Chemical Engineering Calculations. 3 Hours.

Developments of and solutions of equations and mathematical models of chemical processes and mechanisms.

CHEG 5273. Corrosion Control. 3 Hours.

Qualitative and quantitative introduction to corrosion and its control. Application of the fundamentals of corrosion control in the process industries is emphasized.

CHEG 5333. Advanced Thermodynamics. 3 Hours.

Methods of statistical thermodynamics, the correlation of classical and statistical thermodynamics, and the theory of thermodynamics of continuous systems (non-equilibrium thermodynamics).

CHEG 5353. Advanced Separations. 3 Hours.

Phase equilibrium in non-ideal and multicomponent systems, digital and other methods of computation are included to cover the fundamentals of distillation, absorption, and extraction.

CHEG 5513. Biochemical Engineering Fundamentals. 3 Hours.

An introduction to bioprocessing with an emphasis on modern biochemical engineering techniques and biotechnology. Topics include: basic metabolism (prokaryote and eukaryote), biochemical pathways, enzyme kinetics (including immobilized processes), separation processes (e.g. chromatography) and recombinant DNA methods. Material is covered within the context of mathematical descriptions (calculus, linear algebra) of biochemical phenomenon.

CHEG 5733. Polymer Theory and Practice. 3 Hours.

Theories and methods for converting monomers into polymers are presented. Topics include principles of polymer science, commercial processes, rheology, and fabrication.

CHEG 5801. Graduate Seminar. 1 Hour.

Oral presentations are given by master's candidates on a variety of chemical engineering subjects with special emphasis on new developments. Prerequisite: Graduate standing.

CHEG 588V. Special Problems. 1-6 Hour.

Opportunity for individual study of an advanced chemical engineering problem not sufficiently comprehensive to be a thesis. Prerequisite: Graduate standing. May be repeated for up to 6 hours of degree credit.

CHEG 600V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. May be repeated for degree credit.

CHEG 6123. Transport Processes II. 3 Hours.

Continuation of CHEG 5113. Prerequisite: CHEG 5113.

CHEG 6203. Preparation of Research Proposals. 3 Hours.

This course will cover technical communication in both written and oral presentation. Prerequisite: Instructor consent.

CHEG 6801. Graduate Seminar. 1 Hour.

Oral presentations are given by doctoral students on a variety of chemical engineering subjects with special emphasis on new developments. Prerequisite: Graduate standing.

CHEG 688V. Special Topics in Chemical Engineering. 1-3 Hour.

Advanced study of current Chemical Engineering topics not covered in other courses. Prerequisite: Doctoral students only. May be repeated for up to 3 hours of degree credit.

CHEG 700V. Doctoral Dissertation. 1-18 Hour.

Doctoral Dissertation. May be repeated for degree credit.