Courses

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. (Typically offered: Irregular)

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. (Typically offered: Spring Odd Years)

CHEG 5113. Transport Processes I. 3 Hours.
Fundamental concepts and laws governing the transfer of momentum, mass, and heat. (Typically offered: Fall)

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. (Typically offered: Spring)

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. (Typically offered: Spring)

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). (Typically offered: Fall)

CHEG 5443. Chemical Engineering Design II. 3 Hours.
A capstone design class designed for graduate students who do not have an engineering degree. Responsibility for decision making is placed on the students in the solution of a comprehensive, open-ended problem based on an industrial process. Both formal oral and formal written presentation of results are required. Students may not receive credit for both CHEG 4443 and CHEG 5443. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

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 (procaryote and eucaryote), 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. (Typically offered: Spring Even Years)

CHEG 5773. Medical Applications of Membranes Theory, Current Uses, and Development Areas. 3 Hours.
The course will cover most present-day medical products, treatments, and surgical equipment that rely on membrane transport and/or separation to function effectively. Membranes or membrane devices are used when certain human organs stop working or lose some degree of effectiveness. Those that will be covered in this course include the kidney, the pancreas, the lungs, the skin, and the eye. Localized, controlled-release of medications is also an area where membranes are used in medicine and this area will be described also. Along with dialysis, other external membrane treatment processes such as membrane plasmapheresis (a process whereby a membrane is used to separate blood cells from plasma and thereby opening the door for more effectively treating the cells or plasma separately outside of the body) will be discussed. (Typically offered: Irregular)

CHEG 5801. Graduate Seminar. 1 Hour.
Students hear and present oral presentations on innovations in a variety of chemical engineering subjects with special emphasis on new developments. Prerequisite: Graduate standing. (Typically offered: Fall and Spring) May be repeated for up to 12 hours of degree credit.

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. (Typically offered: Fall, Spring and Summer) 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. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

CHEG 6123. Transport Processes II. 3 Hours.
Continuation of CHEG 5113. Prerequisite: CHEG 5113. (Typically offered: Spring)

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. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

CHEG 700V. Doctoral Dissertation. 1-18 Hour.
Doctoral Dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.