CHEMICAL, BIOMOLECULAR, AND CORROSION ENGINEERING

The Department of Chemical, Biomolecular, and Corrosion Engineering offers graduate programs that provide students the opportunity to deepen their fundamental knowledge of chemical engineering and gain professional skills and hands-on experience useful for careers in industry, government, or academia. Faculty research is centered around engineering the molecules, materials, devices, and systems for solving chemical engineering problems and beyond in energy, health, and sustainability industries.

Visit the Department of Chemical, Biomolecular, and Corrosion Engineering website (https://uakron.edu/engineering/cbe/) to learn more about its faculty and facilities.

- Chemical Engineering, MS (https://bulletin.uakron.edu/graduate/colleges-programs/engineering/chemical-engineering/chemical-engineering-ms/)

Chemical Engineering (CHEE)

CHEE 535 Process Analysis & Control (3 Units)
Prerequisites: CHEE 330 and CHEE 353. This course is intended for a student holding a BS in a discipline other than engineering. Response of simple and chemical processes and design of appropriate control systems. (Formerly 4200:535)

CHEE 541 Process Design I (3 Units)
Prerequisites: CHEE 330, CHEE 351, and CHEE 353. Application of chemical engineering fundamentals to the design of a multi-unit process. Emphasis on use of process simulators. Advanced equipment design, oral, written communication skills, teamwork. (Formerly 4200:541)

CHEE 561 Solids Processing (3 Units)
Prerequisites: CHEE 321 and CHEE 353 or permission. Comprehensive problems in sedimentation, fluidization, drying and other operations involving mechanics of particulate solids in liquid and gas continua. (Formerly 4200:561)

CHEE 570 Electrochemical Engineering (3 Units)
Chemical engineering principles as applied to the study of electrode processes and to the design of electrochemical reactors. Topics include electrochemical thermodynamics, cell polarizations, Faraday's Laws, electrode kinetics, transport processes in electrochemical systems, current distributions, reactor design, experimental methods, commercial processes, and batteries and fuel cells. (Formerly 4200:570)

CHEE 572 Separation Processes in Biochemical Engineering (3 Units)
Prerequisite: CHEE 353. Introduction to the separation and purification techniques pertinent to bioprocesses, with emphasis on the engineering considerations for large-scale operations. (Formerly 4200:572)

CHEE 600 Transport Phenomena (3 Units)
Systematic presentation of conservation of momentum, energy and mass at microscopic and macroscopic levels in conjunction with illustrative examples and analogies. (Formerly 4200:600)

CHEE 605 Chemical Reaction Engineering (3 Units)
Prerequisite: CHEE 330 or permission. Kinetics of homogeneous and heterogenous systems. Reactor design for ideal and non-ideal flow systems. (Formerly 4200:605)

CHEE 610 Classical Thermodynamics (3 Units)
Prerequisite: CHEE 225. Discussion of laws of thermodynamics and their application. Predication and correlation of thermodynamic data. Phase and reaction equilibria. (Formerly 4200:610)

CHEE 621 Surface Science in Chemical Engineering (3 Units)
Prerequisite: Permission of instructor. This course emphasizes the basics of surface science (surface energy, wetting, adhesion); surface characterization techniques (contact angle, ellipsometry, XPS); and surface engineering methods (SAMs, soft-lithography). (Formerly 4200:621)

CHEE 622 Biochemical Engineering (3 Units)
Application of chemical engineering principles to biological processes which produce desirable compounds or destroy unwanted or hazardous substances. (Formerly 4200:622)

CHEE 631 Chemical Engineering Analysis (3 Units)
Mathematical analysis of problems in transport processes, chemical kinetics and control systems. Solution techniques for these problems and their practical significances are stressed. Heuristic proofs will be given for necessary theory developments. (Formerly 4200:631)

CHEE 633 Colloids-Principles & Practice (3 Units)
Prerequisite: Permission of instructor. Colloid science and applications in chemical and biomaterials engineering: disperse systems, interparticle forces, surface tension, interfacial thermodynamics, colloid applications, biomaterials applications and characterization techniques. (Formerly 4200:633)

CHEE 680 Heterogenous Catalysis (3 Units)
Prerequisite: CHEE 330. Kinetics and mechanisms of heterogeneous and homogeneous catalytic reactions; characterization and design of heterogeneous catalysts. (Formerly 4200:680)

CHEE 696 Topics in Chemical Engineering (1-3 Units)
(May be repeated for a total of six credits.) Prerequisite: Permission. Topics selected from new and developing areas of chemical engineering, such as electrochemical engineering, coal and synthetic fuels processing, bioengineering, simultaneous heat and mass transfer phenomena and new separation techniques. (Formerly 4200:696)

CHEE 696-1 Metallurgy for Corrosion Resistant Design (1-3 Units)
Prerequisite: Permission. Topics selected from new and developing areas of chemical engineering, such as electrochemical engineering, coal and synthetic fuels processing, bioengineering, simultaneous heat and mass transfer phenomena and new separation techniques.

CHEE 696-2 Surface Science in Chemical Engineering (1-3 Units)
Prerequisite: Permission. Topics selected from new and developing areas of chemical engineering, such as electrochemical engineering, coal and synthetic fuels processing, bioengineering, simultaneous heat and mass transfer phenomena and new separation techniques.

CHEE 697 Chemical Engineering Report (3 Units)
Prerequisite: Permission of advisor. A relevant problem in chemical engineering is studied. Required course for students electing non-thesis option. Final report must be approved by advisor and advisory committee. (Formerly 4200:697)

CHEE 699 Master's Thesis (1-6 Units)
(May be repeated to a maximum of six credits.) For properly qualified candidate for master's degree. Supervised original research in specific area of chemical engineering selected on basis of availability of staff and facilities. (Formerly 4200:699)

CHEE 791 Chemical Engineering Seminar (1 Unit)
(May be repeated for a maximum of six credits.) Prerequisite: Permission of instructor. Advanced level coverage of specialized chemical engineering topics. Intended for students seeking a Ph.D. in engineering. (Formerly 4200:791)

CHEE 794 Advanced Seminar Research Techniques for Engineering (3 Units)
(May be repeated for a total of six credits.) Prerequisite: permission of department chair. Advanced projects, readings and other studies in various areas of chemical engineering. Intended for student seeking Ph.D. in engineering. (Formerly 4200:794)

CHEE 898 Preliminary Research (1-15 Units)
(May be repeated for a total of 15 credits.) Prerequisite: approval of dissertation director. Preliminary investigations prior to the submission of a dissertation proposal to the Interdisciplinary Doctoral Committee. (Formerly 4200:898)

CHEE 899 Doctoral Dissertation (1-15 Units)
(May be taken more than once.) Prerequisite: acceptance of research proposal by the Interdisciplinary Doctoral Committee and approval of the dissertation director. Original research by the doctoral student. (Formerly 4200:899)