

Department of Chemical and Biomedical Engineering

Degrees Offered

- Masters of Science, Biomedical Engineering (M.S.Bm.E.)
- Masters of Science, Chemical Engineering (M.S.Ch.E.)
- Doctor of Philosophy, Biomedical Engineering (Ph.D.)
- Doctor of Philosophy, Chemical Engineering (Ph.D.)

Departmental Overview

The Department of Chemical and Biomedical Engineering has one of the oldest doctoral-granting programs in the university. From the initial doctoral degree in 1932, the graduate academic program has been based on advanced engineering fundamentals, while the research program has reflected a balance of fundamental research areas and their application to relevant technological areas such as decarbonization of energy systems, sustainability, precision medicine, flexible manufacturing, novel materials, modeling and computational tools.

Areas of Research

The Chemical and Biomedical Engineering faculty are presently involved in a broad spectrum of research areas that can be broadly classified into biomedical engineering, catalysis and reaction engineering, materials and interfacial phenomena, and process systems engineering. These research activities impact economic development, national security, the stability and sustainability of the energy supply, and many quality-of-life issues.

Faculty members possess a wide spectrum of industrial experience and are routinely in contact with their counterparts in industry. This contact with real engineering problems enables them to convey a practical experience to students while keeping in perspective many of the fundamental concepts involved in graduate study. The faculty is nationally and internationally recognized through the publication of text books, monograph series, and technical papers as well as presentations in national and international conferences.

FACULTY

CHAIR

- Srinivas Palanki - Ph.D. (University of Michigan)
Process systems engineering, Chemical process control, Bioengineering

PROFESSORS

- Debangsu Bhattacharyya - Ph.D. (Clarkson University)
GE Plastics Material Engineering Professor. Artificial intelligence and machine learning, Biomimetic and other advanced control Nonlinear state estimation, Condition monitoring, Sensor placement, Bayesian analysis, Multi-scale dynamic modeling, Fuel cells and electrolyzers, Carbon capture, H₂ production, Biomass conversion and Energy systems
- Zoica Cerasela Dinu - Ph.D. (Max Planck Inst of Molecular Cell Biology & Genetics & Dresden University of Technology)
Associate Dean for Student, Faculty and Staff Engagement. Nanomaterials, Bionanotechnology, Biomimetics, Catalysis and Biocatalysis
- Pradeep Fulay - Ph.D. (University of Arizona)
Advanced Electronics, Magnetic Materials and Devices, Flexible Electronics, Synthesis and Processing of Nanomaterials
- Rakesh Gupta - Ph.D. (University of Delaware)
Berry Professor. Polymer processing, Rheology, Non-Newtonian fluid mechanics, Composite materials
- John (Jianli) Hu - Ph.D. (Tsinghua University)
Statler Chair Professor. Catalysis and reaction engineering, Utilization of natural gas, CO₂ and biomass
- David J. Klinke - Ph.D. (Northwestern University)
Systems Biology, Kinetics, Cellular Signal Transduction Pathways, Immunology, Mathematical Modeling, Bioengineering

ASSOCIATE PROFESSOR

- Fernando V. Lima - Ph.D. (Tufts University)
Process design and operability, Model-based control and Optimization, State estimation and process identification, Modular energy systems and sustainability

ASSISTANT PROFESSOR

- Madelyn R. Ball - Ph.D. (University of Wisconsin - Madison)
Heterogeneous catalysis, Metal nanoparticle development, Operando spectroscopic characterization, Reaction Kinetics, CO₂ utilization, Hydrogenation chemistry
- Margaret F. Bennewitz - Ph.D. (Yale University)
Biomedical imaging, Fluorescence intravital lung microscopy, MRI contrast agents, Nano drug delivery systems, Microfluidics, Tumor microenvironment, Cancer metastasis, Toxicology
- Stephen M. Cain - Ph.D. (University of Michigan)
MEMS inertial sensor applications, Wearable sensor applications, Real-world biomechanics, Upper extremity biomechanics, Human gait, Sports biomechanics, Experimental methods, Bicycle dynamics, Medication adherence
- Moriah Katt - Ph.D. (Johns Hopkins University)
Blood-brain barrier, Tissue engineering, Stroke, Drug delivery, Stem cells
- Wenyuan Li - Ph.D. (West Virginia University)
Solid state ionics, Solid oxide fuel/electrolysis cells, High temperature electrochemistry, Shale gas conversion and utilization, CO₂ utilization
- Oishi Sanyal - Ph.D. (Michigan State University)
Membrane for water treatment and desalination, Self-assembly based surface modification, Molecular sieving materials, Natural gas and Flue gas purification
- Soumya K. Srivastava - Ph.D. (Mississippi State University)
Point-of-care (POC) medical diagnostic platforms and environmental bio-separations using electrokinetics, Transport phenomena, Fluid dynamics, and Dielectric spectroscopy
- Yuhe Tian - Ph.D. (Texas A&M University)
Process systems engineering, Computer-aided process intensification, Process synthesis and optimization, Multi-scale sustainable energy systems, Hybrid mechanistic/data-driven modeling
- Yuxin Wang - Ph.D. (Chinese Academy of Science)
Plastic upcycling, Natural gas and CO₂ utilization, Biofuel, and Catalysis

TEACHING ASSOCIATE PROFESSOR

- Robin S. Hissam - Ph.D. (University of Delaware)
Associate Dean of Academics and Student Performance. Biomaterials, Polypeptides, Drug delivery, Bioengineering and materials science

TEACHING ASSISTANT PROFESSOR

- Jeremy S. Hardinger - Ph.D. (West Virginia University)

PROFESSORS EMERITUS

- Eung H. Cho - Ph.D. (University of Utah)
Mineral Processing, Leaching, Solvent Extraction, Environmental Science
- Eugene V. Cileto - Ph.D. (University of Cincinnati)
Physiological Transport Phenomena, Biomedical Engineering, Image Analysis, Mathematical Modeling
- Dady B. Dadyburjor - Ph.D. (Delaware)
Catalysis, Reaction Engineering
- Edwin L. Kugler - Ph.D. (Johns Hopkins)
Catalysis, Adsorption, Coal Liquefaction
- Joseph A. Shaeiwitz - Ph.D. (Carnegie-Mellon University)
Design, Design Education, Outcomes Assessment
- Alfred H. Stiller - Ph.D. (University of Cincinnati)
Physical/Inorganic/Solution Chemistry, Coal Liquefaction, Carbon Science
- Charter D. Stinespring - Ph.D. (West Virginia University)
Semiconductor Growth and Etching, Surface Kinetics, Thin Films, Electronic Materials
- Richard Turton - Ph.D. (Oregon State University)
WVU Bolton Professor, P.E.; Process systems engineering, Particle and powder technology, Chemical process design
- Ray Y.K. Yang - Ph.D. (Princeton)
Biochemical and Chemical Engineering, Nonlinear Dynamics
- John W. Zondlo - Ph.D. (Carnegie Mellon University)
Coal Enhancement and Utilization, Carbon Science, Fuel Cells

For specific information on the following programs, please see the links to the right:

- Biomedical Engineering
- Chemical Engineering