The Department of Chemical and Biochemical Engineering (CBE) has been involved in chemical engineering education and research since our founding in the early 1960s. Our strong foundation in computational methods and modeling and systems engineering is clustered in the areas of pharmaceutical science and technology, engineering in the life sciences (biotechnology, biomolecular engineering, and tissue engineering), and the design, manufacture, and application of nanostructured materials. We combine an innovative educational experience with many opportunities for practical training and connections to local industry and professional societies.

VISION AND MISSION
We strive for innovation, leadership, and excellence in chemical engineering scholarship, education, and service. We endeavor to promote the development and education of future leaders in chemical engineering. We seek to create and sustain a mutually supportive, stimulating environment to promote the individual and professional growth of members of our academic community.

AREAS OF RESEARCH
Specific research programs cover areas such as catalysis, next generation pharmaceutical engineering, drug delivery systems, modeling of metabolic pathways, refinery operations, nucleation and solubility of drugs in polymers, biomass conversion, and risk management.

EDUCATIONAL ADVANTAGE
Our innovative courses and programs are designed to train students for careers as industry leaders and academic distinction. CBE is a collaborative, interdisciplinary academic community committed to transformative education and research that is ethically responsible and sustainable. Students contribute through engagement in cutting-edge research and participation in student organizations and activities, developing leadership skills and broadening their experience. Faculty members include internationally recognized experts in their fields.

About the Department
- Among the top 50 CBE graduate programs (USA Today/College Factual)
- 250+ undergraduate and 200+ graduate students
- 21 faculty
- Areas of study
  - Chemical Engineering
  - Biochemical Engineering
  - Pharmaceutical Engineering
- Cross-disciplinary research and strong collaborations and joint faculty in biomedical engineering, chemistry, and pharmacy
- Blend of fundamental engineering science and industrial relevance
RESEARCH CENTERS OF EXCELLENCE

Center for Structured Organic Particulate Systems (C-SOPS)
A cross-disciplinary team of engineers, scientists, and industry leaders from Rutgers University, Purdue University, New Jersey Institute of Technology, and University of Puerto Rico at Mayaguez are working to improve the way pharmaceuticals, foods, and agricultural products are manufactured. C-SOPS focuses on advancing the scientific foundation for the optimal design of SOPS with advanced functionality while developing the methodologies for their active control and manufacturing.

Catalyst Manufacturing Center
By combining the substantial level of expertise in particle technology, optimization, multi-scale simulation, catalysis, and molecular modeling available at Rutgers, the center develops and promotes science-based methods for designing and optimizing catalyst manufacturing methods and processes that include impregnation, drying, slurry mixing, extrusion, and calcination.

PHARMACEUTICAL SCIENCE AND ENGINEERING

The department’s Pharmaceutical Engineering and Science graduate program meets a growing industry need for pharmaceutical engineers with advanced skills in mathematics, science, and pharmaceutical processes. By providing graduate-level training in state-of-the-art research, design, and manufacturing practices and protocols, students acquire the ability to design a system, component, or process that solves a pharmaceutical engineering need while additionally benefiting from the close research ties and connections made possible by Rutgers’ location in the heart of New Jersey’s pharmaceutical corridor.

FACULTY

Ioannis Androulakis
Systems biology and engineering and data mining

Tewodros (Teddy) Asefa
Nanomaterials

Alex Bertuccio
Engineering education

Helen Buettner (Chair)
Nerve regeneration, diversity in engineering, and education

Fuat Celik
Heterogeneous catalysis for energy applications

Yee Chiew
Molecular thermodynamics of complex fluids

Shishir Chundawat
Cellulosic biofuels and glycoengineering

Meenakshi Dutt
Simulations of particulate systems and soft materials

Benjamin Glasser
Multiphase flows and pharmaceutical engineering

Masanori Hara
Ionic polymers

Prabhas Moghe
Cell and tissue engineering and nanobiomaterials

Fernando Muzzio
Continuous manufacturing and pharmaceutical engineering

Alexander Neimark
Modeling and characterization of nanomaterials

Henrik Pedersen
Plant cell culture and biophotonics

Rohit Ramachandran
Process systems and pharmaceutical engineering

Charles Roth
Nanomedicine and engineering in biology

Benjamin Schuster
Bio-inspired materials and molecular and cell engineering

Nina Shapley
Multiphase fluid mechanics and rheology and imaging

Ravendra Singh
Process system engineering in pharmaceutical manufacturing

M. Silvina Tomassone
Molecular thermodynamics and nanotechnology

George Tsilomelekis
Catalysis and operando spectroscopy

Haoran Zhang
Cell and metabolic engineering

cbe.rutgers.edu