Course X
Defining research and developing leaders at the interface of engineering and molecular sciences

Chemical Engineering focuses on the transformation of molecules into processes and products. Through an emphasis on these transformations, coupled with a mastery of engineering principles, MIT chemical engineers confront production challenges from the molecular to the macroscopic level, spearheading new developments in medicine, biotechnology, microelectronics, advanced materials, energy, consumer products, manufacturing, and environmental solutions.

Our research directly addresses the challenges facing the world today:
- New energy technologies, including photovoltaics, fuel cells, biofuel refining, and gas to liquid
- Biomedical devices and methods, including cancer and AIDS research
- Materials for electronic, optical, medical, and energy-conversion devices
- Biotechnology for therapeutics and biofuels
- New approaches to pharmaceutical manufacturing
- Process design and control for chemical, energy-conversion, and materials processes

Our undergraduates can pursue a traditional degree, a bio-focused BS in Chemical –Biological Engineering, or a flexible degree with a concentration in energy, biomedical engineering, materials design and processing, or environmental studies. This flexible degree intellectually organizes subjects in a manner that improves students’ ability to move from the disciplinary foundations of their major to multidisciplinary practice.

Our graduate programs offer a range of unique degrees. The MS in Chemical Engineering Practice (MSCEP) includes a semester at industrial sites with the David H. Koch School of Chemical Engineering Practice. Students can also augment a traditional PhD with work at the MIT-Sloan School of Management.

Collaboration is a unifying concept behind our students’ research projects. The molecular foundations of chemical engineers make their interests converge with those of other fields. We work across disciplines – comprising a variety of science and engineering departments – and with research organizations and commercial enterprises beyond campus.
The MIT ChemE current and emeriti faculty includes 14 members of the National Academy of Engineering, three members of the National Academy of Science, and ten members of the Academy of Arts and Sciences.

D. G. Anderson
R. C. Armstrong
P. I. Barton
M. Bazant
D. Blankschtein
R. D. Braatz
F. R. Brushett
A. K. Chakraborty
R. E. Cohen
C. K. Colton
C. L. Cooney
P. S. Doyle
K. K. Gleason
W. H. Green
P. T. Hammond
T. A. Hatton
K. F. Jensen, Head
J. Kroll
R. S. Langer
D. A. Lauffenburger
J. C. Love
N. Maheshri
A. S. Myerson
B. D. Olsen
K. J. Prather
Y. Román
G. Rutledge
H. D. Sikes
M. S. Strano
George Stephanopoulos
Greg Stephanopoulos
W. A. Tisdale
B. L. Trout
P. S. Virk
D. I. C. Wang
K. D. Wittrup

Professor Arup Chakraborty is director of the newly created Institute for Medical Engineering and Science, which aims to pioneer novel research paradigms to advance health and educate a generation of leaders working at the convergence of engineering, science, and clinical medicine. Professors Langer and Love are also integral to the Ragon Institute’s work to achieve an HIV/AIDS vaccine lead the collaborative study of immunology.

MIT ChemE contributes to many interdisciplinary research centers across the Institute, such as:

- Institute for Soldier Nanotechnology [web.mit.edu/isn/index.html]
- Center for Materials Science & Engineering [web.mit.edu/cmse/]
- Materials Processing Center [mpc-web.mit.edu/]
- Center for Biomedical Engineering [web.mit.edu/cbe/www/]
- Biotechnology Process Engineering Center [web.mit.edu/bpec/]
- MIT Energy Initiative [web.mit.edu/mitei/]
- Ragon Institute [www.ragoninstitute.org]
- Institute for Medical Engineering & Science [imes.mit.edu]