**Chemical: Biochemical and Environmental Engineering (Option B)**

**September 2019** (students who entered first year in September 2016)

### Year 2:

**Term A**

- AM 2270a Applied Math for Engineering II
- CBE 2206a Introductory Industrial Organic Chemistry
- CBE 2214a Engineering Thermodynamics
- CBE 2220a Chemical Process Calculations
- CBE 2290a Fundamentals of Biochemical and Environmental Engineering
- ES 2211F Engineering Communications

**Term B**

- AM 2277b Applied Math Chemical and Civil Engineering III
- CBE 2207b Applied Industrial Organic Chemistry
- CBE 2221b Fluid Flow
- CBE 2224b Chemical Eng. Thermodynamics
- CBE 2291b Computational Methods for Engineering
- SS 2143b Applied Statistics and Data Analysis for Engineers

### Year 3:

**Term A**

- CBE 3330a Bioreaction & Bioprocess Engineering
- CBE 3315a Reaction Engineering
- CBE 3318a Introduction to Chemical Process Simulation
- CBE 3322a Heat Transfer Operations
- CBE 3325a Particulate Operations
- CBE 3396y Biochemical Engineering Lab

**Term B**

- CBE 3310b Process Dynamics and Control
- CBE 3319b Introduction to Plant Design and Safety
- CBE 3323b Staged Operations
- CBE 3324b Mass Transfer Operations
- CBE 3396y Biochemical Engineering Lab
- ECE 2208b Electrical Measurement and Instrumentation
- CBE4403b Biochemical Separation Processes

### Year 4:

**Term A**

- Bus 2299E Business for Engineers
- CBE 4498 Biochemical Process and Plant Design
- Two 0.5 Technical elective

0.5 Non-technical elective taken from approved list

**Term B**

- Bus 2299E Business for Engineers
- CBE 4498 Biochemical Process and Plant Design
- Two 0.5 Technical elective

ES 4498G Engineering Ethics, Sustainable Development and the Law

Accelerated Masters students can take a graduate course with special permission from the Department Chair.

### NOTES:

**Technical Elective List:**

Some technical electives may not be offered in a given academic year. Consult the Department for accurate listing.

### General Chemical Engineering Courses

- CBE 4404a/b Downstream Processing in Pharmaceutical Manufacturing
- CBE 4413a/b Selected Topics in Chemical Engineering
- CBE 4417a/b Catalytic Processes
- CBE 4418a/b Industrial Multiphase Reactor Design
- CBE 4420a/b Computer Process Control
- CBE 4432a/b Energy and Fuels Production Systems
- CBE 4485a/b Energy and Society
- CBE 4493a/b Polymer Engineering

### Biochemical and Environmental Engineering Courses

- CBE 4407a/b Solid Waste Treatment
- CBE 4425 Biochemical & Environmental Eng. Project
- CBE 4421a/b Introduction to Biomaterials Engineering
- CBE 4422a/b Nanobiotechnology
- CBE 4423a/b Tissue Engineering
- CBE 4424a/b Biosensor Principles and Applications
- CBE 4463a/b Water Pollution Design
- CEE 3362a/b Drinking Water Quality and Treatment
- CEE 4405a/b Air Pollution
- GPE 4484a/b Green Fuels and Chemicals
- MME 4429a/b Nuclear Engineering