ENGINEERING (COURSE 10-ENG)

Department of Chemical Engineering (*https://catalog.mit.edu/schools/engineering/chemical-engineering/#undergraduatetext*)

Bachelor of Science in Engineering

General Institute Requirements (GIRs)

The General Institute Requirements include a Communication Requirement that is integrated into both the HASS Requirement and the requirements of each major; see details below.

Summary of Subject Requirements	Subjects
Science Requirement	6
Humanities, Arts, and Social Sciences (HASS) Requirement; at least two of these subjects must be designated as communication-intensive (CI-H) to fulfill the Communication Requirement.	8
Restricted Electives in Science and Technology (REST) Requirement [can be satisfied by 10.301 and 18.03 in the Departmental Program]	2
Laboratory Requirement (12 units) [can be satisfied by 1.106/1.107, 2.671, 3.010, 5.310, or 12.335 in the Departmental Program]	1
Total GIR Subjects Required for SB Degree	**17**

Physical Education Requirement
Swimming requirement, plus four physical education courses for eight points.

Departmental Program

Choose at least two subjects in the major that are designated as communication-intensive (CI-M) to fulfill the Communication Requirement.

Required Subjects		Units
5.601	Thermodynamics I	6
10.10	Introduction to Chemical Engineering	12
10.213	Chemical and Biological Engineering Thermodynamics	12
10.301	Fluid Mechanics	12
10.302	Transport Processes	12
10.37	Chemical Kinetics and Reactor Design	12
18.03	Differential Equations	12
Foundational Concepts		
All subjects are suitable for any concentration within the program. In consultation with the advisor, students select one subject from each of the three groups. Students may not exceed the 45-unit cap except by petition.		39-45
Group I		
Select one of the following Course 10 CI-M subjects:		
10.26	Chemical Engineering Projects Laboratory (CI-M)	
10.27	Energy Engineering Projects Laboratory (CI-M) [1]	
10.28	Chemical-Biological Engineering Laboratory (CI-M)	
10.29	Biological Engineering Projects Laboratory (CI-M) [2]	
10.467	Polymer Science Laboratory (CI-M) [3]	
Group II		
Select one of the following Institute Laboratory subjects:		
1.106 & 1.107	Environmental Fluid Mechanics Lab and Environmental Chemistry Laboratory (CI-M) [4]	
2.671	Measurement and Instrumentation (CI-M)	
3.010	Structure of Materials	
5.310	Laboratory Chemistry (CI-M)	
7.002	Fundamentals of Experimental Molecular Biology	
10.7003[J]	Applied Molecular Biology Laboratory	
12.335	Experimental Atmospheric Chemistry (CI-M) [4]	
20.109	Laboratory Fundamentals in Biological Engineering (CI-M) [2]	
Group III		
Select one of the following:		
1.00	Engineering Computation and Data Science	
1.018[J]	Fundamentals of Ecology	
1.080	Environmental Chemistry	
3.155[J]	Micro/Nano Processing Technology (CI-M) [3]	
5.12	Organic Chemistry I	
5.611 & 5.612	Introduction to Spectroscopy and Electronic Structure of Molecules	
6.100A & 6.100B	Introduction to Computer Science Programming in Python and Introduction to Computational Thinking and Data Science	

7.03	Genetics [2]	
8.21	Physics of Energy [1]	
Engineering Concentration		
These four electives define a concentrated area of study in one of the following designated concentrations: Biomedical Engineering; Energy; Engineering Computation; Environmental Studies; Manufacturing Design; Materials Process and Design; or Process Data Analytics. [5]		39-48
Capstone		
Select one of the following options to obtain at least 12 units of capstone experience: Senior Thesis, Integrated Chemical Engineering or Integrated Chemical Engineering Topics modules, or Senior Project.		12-15
Option 1		
10.THU	Undergraduate Thesis	
Option 2		
Select any combination of the following:		
10.490	Integrated Chemical Engineering [6]	
10.492A	Integrated Chemical Engineering Topics I	
10.492B	Integrated Chemical Engineering Topics I	
10.493	Integrated Chemical Engineering Topics II	
10.494A	Integrated Chemical Engineering Topics III	
10.494B	Integrated Chemical Engineering Topics III	
Option 3		
10.910	Independent Research Problem	
and select any combination of the following:		
10.492A	Integrated Chemical Engineering Topics I	
10.492B	Integrated Chemical Engineering Topics I	
10.493	Integrated Chemical Engineering Topics II	
10.494A	Integrated Chemical Engineering Topics III	
10.494B	Integrated Chemical Engineering Topics III	
Units in Major		**168-183**
Unrestricted Electives		**48**
Units in Major That Also Satisfy the GIRs		(36)
Total Units Beyond the GIRs Required for SB Degree		**180-198**

The units for any subject that counts as one of the 17 GIR subjects cannot also be counted as units required beyond the GIRs.

1 *Subject may be of particular interest for energy concentration.*

2 *Subject may be of particular interest for biomedical engineering concentration.*

3 *Subject may be of particular interest for materials process and design concentration.*

4 *Subject may be of particular interest for environmental studies concentration.*

5 *In all cases, the electives must be chosen with the approval of the student's advisor and the department. The combined list of required and elective subjects must sum to a minimum of 135 units in engineering topics (equivalent to 45 credit hours as defined by ABET). Lists of recommended subjects for each concentration are available from the department, and additional information on current subject offerings is available in the MIT Course Catalog (https://catalog.mit.edu/subjects/10). Note that subjects that have been used to satisfy the foundational concepts may not also be counted toward the engineering concentration.*

6 *10.490 may be repeated once for credit with permission of instructor.*