

Bachelor of Science in Engineering as Recommended by the Department of Chemical Engineering/Course 10-ENG

General Institute Requirements (GIRs)

Science Requirement
Humanities, Arts, and Social Sciences Requirement
Restricted Electives in Science and Technology (REST) Requirement [can be satisfied from among [5.60](#), [10.301](#), or [18.03](#) or in the Departmental Program]
Laboratory Requirement [can be satisfied by [1.106](#) and [1.107](#), or [2.671](#), [3.014](#), [5.310](#), [10.467](#), [10.702](#)], or [12.335](#) in the Departmental Program]

Subjects

6
8
2
1

Total GIR Subjects Required for SB Degree

17

Communication Requirement

The program includes a Communication Requirement of 4 subjects:
2 subjects designated as Communication Intensive in Humanities, Arts, and Social Sciences (CI-H); and
2 subjects designated as Communication Intensive in the Major (CI-M).

PLUS Departmental Program

Subject names below are followed by credit units, and by prerequisites, if any (corequisites in italics)

Units

Required Subjects

[5.60](#) Thermodynamics and Kinetics, 12, REST; [Calculus II \(GIR\)](#), [Chemistry \(GIR\)](#)
[18.03](#) Differential Equations, 12, REST; [Calculus II \(GIR\)](#)
[10.10](#) Introduction to Chemical Engineering, 12; [Physics I \(GIR\)](#), [Calculus I \(GIR\)](#), [Chemistry \(GIR\)](#)
[10.213](#) Chemical and Biological Engineering Thermodynamics, 12; [5.60](#), [10.10](#)
[10.301](#) Fluid Mechanics, 12, REST; [18.03](#), [10.10](#)
[10.302](#) Transport Processes, 12; [5.60](#), [10.301](#), [10.213](#); or permission of instructor
[10.37](#) Chemical Kinetics and Reactor Design, 9; [5.60](#), [10.301](#)

81

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. Choose one of the following Course 10 CI-M subjects:

[10.26](#) Chemical Engineering Projects Laboratory, 15, CI-M; [5.310*](#); [10.302](#); or permission of instructor
[10.27](#) Energy Engineering Projects Laboratory, 15, CI-M^(a); [5.310*](#); [10.302](#); or permission of instructor
[10.28](#) Chemical-Biological Engineering Laboratory, 15, CI-M; [7.05*](#); or permission of instructor
[10.29](#) Biological Engineering Projects Laboratory, 15, CI-M^(b); [5.310*](#); [10.302](#); or permission of instructor
[10.467](#) Polymer Science Laboratory, 15, LAB, CI-M^(c); [5.12](#); [5.310*](#)

Group II. Choose one of the following Institute Laboratory subjects:

[1.106](#) Environmental Fluid Transport Processes and Hydrology Laboratory, 6, LAB^(d); [1.061](#), [1.070](#)
and
[1.107](#) Environmental Chemistry and Biology Laboratory, 6, LAB^(a); [1.080](#)
[2.671](#) Measurement and Instrumentation, 12, LAB, CI-M; [2.001](#), [2.003j](#), [Physics II \(GIR\)](#)
[3.014](#) Materials Laboratory, 12, LAB, CI-M^(b)
[5.310](#) Laboratory Chemistry, 12, LAB, M; [5.12](#)

[5.35](#) Introduction to Experimental Chemistry, 12, LAB; [Chemistry \(GIR\)](#)

—Module 1 Survey of Spectroscopy, 4
—Module 2 Inorganic Synthesis and Kinetics, 4; *Module 1*
—Module 3 Polymeric Light Emitting Devices, 4; [5.12](#), *Module 2*

[12.335](#) Experimental Atmospheric Chemistry, 12, LAB, CI-M^(d); [Chemistry \(GIR\)](#)

[20.109](#) Laboratory Fundamentals in Biological Engineering, 15, LAB, CI-M^(a); [Biology \(GIR\)](#), [Chemistry \(GIR\)](#),
[6.00](#), [18.03](#); [20.110*](#)

Group III. Choose one of the following:

[1.00](#) Introduction to Computers and Engineering Problem Solving, 12, REST; [Calculus I \(GIR\)](#)

[1.018j](#) Ecology I: The Earth System, 12, REST^(a)

[1.080](#) Environmental Chemistry, 12^(a); [Chemistry \(GIR\)](#)

[3.012](#) Fundamentals of Materials Science and Engineering, 15, REST^(b); [18.03*](#)

[3-155j](#) Micro/Nano Processing Technology, 12, CI-M^(b); permission of instructor

[5.12](#) Organic Chemistry I, 12, REST; [Chemistry \(GIR\)](#)

[5.61](#) Physical Chemistry, 12, REST; [Physics II \(GIR\)](#), [Calculus II \(GIR\)](#), [Chemistry \(GIR\)](#)

[6.00](#) Introduction to Computer Science and Programming, 12, REST

[7.03](#) Genetics, 12, REST^(b); [Biology \(GIR\)](#)

[8.21](#) Physics of Energy, 12, REST^(b); [Physics II \(GIR\)](#), [Calculus II \(GIR\)](#), [Chemistry \(GIR\)](#)

Engineering Concentration

39–48

These four electives define a concentrated area of study in one of the following designated concentrations: biomedical engineering, energy, environmental studies, or materials process and design. In all cases, the electives must be chosen with the approval of the student's advisor and the department. Lists of recommended subjects for each concentration are available from the department. Note that subjects that have been used to satisfy the foundational concepts may not also be counted toward the engineering concentration.

Capstone

12

Choose one of the following options to obtain 12 units of capstone experience: *Senior Thesis*, *Integrated Chemical Engineering* or *Integrated Chemical Engineering Topics* modules, or *Senior Project*.

Option 1

[10.ThU](#) Undergraduate Thesis, 12

Option 2. Any combination of the following:

[10.490](#) Integrated Chemical Engineering I, [10.37](#)

[10.492](#) Integrated Chemical Engineering Topics I, [10.301](#) and permission of instructor

[10.493](#) Integrated Chemical Engineering Topics II, [10.301](#) and permission of instructor

[10.494](#) Integrated Chemical Engineering Topics III, [10.301](#) and permission of instructor

Option 3

[10.910](#) Independent Research Problems, units arranged

and any combination of the following:

Integrated Chemical Engineering Topics I, [10.301](#) and permission of instructor

Integrated Chemical Engineering Topics II, [10.301](#) and permission of instructor

Integrated Chemical Engineering Topics III, [10.301](#) and permission of instructor

Departmental Program Units That Also Satisfy the GIRs

(36)

Unrestricted Electives

48

Total Units Beyond the GIRs Required for SB Degree

183–198

No subject can be counted both as part of the 17-subject GIRs and as part of the 183–198 units required beyond the GIRs. Every subject in the student's departmental program will count toward one or the other, but not both.

Notes

*Alternate prerequisites are listed in the subject description.

^(a)Subject may be of particular interest for energy concentration.

^(b)Subject may be of particular interest for biomedical engineering concentration.

^(c)Subject may be of particular interest for materials process and design concentration.

^(d)Subject may be of particular interest for environmental studies concentration.

For an explanation of credit units, or hours, please refer to the online help of the MIT Subject Listing & Schedule, <http://student.mit.edu/catalog/index.cgi>.