

Chemical Engineering undergraduate curriculum

The following information on required course work includes semester-specific advising information. This information is intended to be a supplement for meeting with your advisor to discuss your career goals and professional development. We hope it will serve to guide your discussions with your advisor and allow you to concentrate on more important issues than what classes to take during your meetings.

First year - Fall

Course	Description	Units
99-101	Computing @ Carnegie Mellon	3
76-xxx	Designated Writing/Expression Course	9
21-120	Differential and Integral Calculus (<i>C grade or better</i>)	10
06-100	Intro to Chemical Engineering	12
09-105	Intro to Modern Chemistry I	10
	Total Units	44

First year - Spring

Course	Description	Units
21-122	Integration, Differential Equations & Approximation (<i>C grade or better</i>)	10
xx-100/101	Introductory Engineering Elective (other than ChE)	12
33-141	Physics I for Engineering Students	12
xx-xxx	Select one: PCC, SDM, I&I, W&E, or GE	9
	Total Units	43

Second Year - Fall

Course	Description	Units
21-259	Calculus in Three-Dimensions (<i>C grade or better</i>)	9
06-221	Thermodynamics	9
06-222	Sophomore Chemical Engineering Seminar*	1
09-106	Modern Chemistry II	10
xx-xxx	Computer Sci./Physics II**	10 or 12
xx-xxx	Select one: PPC, SDM, I&I, W&E, or GE	9
39-210	Experiential Learning I	0
	Total Units	48 or 50

Second Year - Spring

Course	Description	Units
06-261	Fluid Mechanics	9
06-262	Mathematical Methods of Chemical Engineering	12
09-221	Lab I: Introduction to Chemical Analysis	12
xx-xxx	Physics II/Computer Sci.**	10 or 12
xx-xxx	Select one: PPC, SDM, I&I, 2&E, GE (excluding categories fulfilled after 1 st year)	9
39-220	Experiential Learning II	0
	Total Units	52 or 54

Third Year - Fall

Course	Description	Units
06-321	Chemical Engineering Thermodynamics	9
06-322	Junior Chemical Engineering Seminar*	2
06-323	Heat and Mass Transfer	9
09-217/219	Organic Chemistry I or Modern Organic Chemistry	9 or 10
09-347	Advanced Physical Chemistry	12
xx-xxx	Select on: PPC, SDM I&I, W&E, GE (excluding categories fulfilled after 1 st year)	9
39-310	Experiential Learning III	0
	Total Units	50 or 51

Third Year - Spring

Course	Description	Units
06-361	Unit Operations of Chemical Engineering †	9
06-363	Transport Processes Laboratory	9
06-364	Chemical Reaction Engineering	9
03-232	Biochemistry***	9
xx-xxx	Unrestricted Elective	9
xx-xxx	Select one: PPC, SDM I&I, W&E, GE (excluding categories fulfilled after 1 st year)	9
	Total Units	54

Fourth Year - Fall

Course	Description	Units
06-421	Chemical Process Systems Design	12
06-423	Unit Operations Laboratory	9
xx-xxx	Unrestricted Elective	9
xx-xxx	Unrestricted Elective	9
xx-xxx	Select one: PPC, SDM I&I, W&E, GE (excluding categories fulfilled after 1 st year)	9
	Total Units	48

Fourth Year - Spring

Course	Description	Units
06-462	Optimization Modeling and Algorithms	6
06-463	Chemical Product Design	6
06-464	Chemical Engineering Process Control	9
xx-xxx	Unrestricted Elective	9
xx-xxx	Unrestricted Elective	9
xx-xxx	Select one: PPC, SDM I&I, W&E, GE (excluding categories fulfilled after 1 st year)	9
	Total Units	48

† Courses include projects.

* For students pursuing a Chemical Engineering/Biomedical Engineering double major, the Chemical Engineering Junior Seminar course (06-322) is replaced by the Biomedical Engineering course Professional Issues in Biomedical Engineering (42-201).

** **Computer Science/Physics II:** Students should complete 15-110 (Introduction to Programming) or 15-112 (Fundamentals of Programming & CS) as well as 33-142 (Physics II for Engineering and Physics Students) by the end of the second year. The recommended sequence is 33-141 / 142 for engineering students, however, 33-151 / 152 will also meet the CIT Physics requirement.

For those students who have not taken 06-100 as one of the two Introductory Engineering Electives, 06-100 should be taken in the Fall Semester of the Second year. The General Education Course normally taken during that semester may be postponed until the Third year. These students should consult with their faculty advisors as soon as possible.

***Students pursuing a Chemical Engineering/Engineering and Public Policy double major are waived from taking the Biochemistry Elective. They will take 36-220.

Notes:

1. In addition to the graduation requirement of an overall QPA of 2.0 (not counting the First year), the Department of Chemical Engineering requires a cumulative QPA of 2.0 in all chemical engineering courses (all those numbered 06-xxx).
2. **Minimum number of units required for degree: 389.**
3. All mathematics (21-xxx) courses required for the engineering degree taken at Carnegie Mellon must have a minimum grade of C in order to be counted toward the graduation requirement for the BS engineering degree.
4. **Overloads** are permitted only for students maintaining a QPA of 3.5 or better during the preceding semester.
5. **Electives:** To obtain a Bachelor of Science degree in Chemical Engineering, students must complete 06-100 and one other Introductory Engineering Elective. There are also five Unrestricted Electives. At most, 9 units of ROTC or Physical Education can be counted toward these electives. **Students must discuss their choices of electives with their faculty advisors.**

6. **Undergraduate Research:** Independent research projects are available by arrangement with a faculty advisor. Many students conduct these research projects for elective credit by enrolling in 06-200, 300, or 400 (Sophomore, Junior, or Senior Research Projects) or 39-500 (College of Engineering Honors Research) for eligible seniors.