

# BESA-Chemical Engineering

Fall 2023

## Bachelor of Engineering Studies and Arts (BESA)

**College of Engineering (ENG) Concentration in Chemical Engineering**

**102 units (minimum)**

**Advisor:** [Nora Siewiorek](mailto:norann@andrew.cmu.edu), DH 1111, 412-268-1566, [norann@andrew.cmu.edu](mailto:norann@andrew.cmu.edu)

### Mathematics & Science Prerequisites

21-120	Differential and Integral Calculus (Gen Ed)	10
21-122	Integration and Approximation (Gen Ed)	10
21-254	Linear Algebra and Vector Calculus for Engineers (Fall, Sophomore year)	11
15-110	Principles of Computing	10
33-141	Physics I for Engineering Students (Gen Ed)	12
33-142	Physics II for Engineering and Physics Students	12
09-105	Introduction to Modern Chemistry I	10
09-106	Modern Chemistry II	10

### Chemical Engineering Courses

**75 units**

06-100	Introduction to Chemical Engineering (Freshman year; co-req: 09-105, 21-120)	12
xx-xxx	2 <sup>nd</sup> Introduction to Engineering course, student's choice	12
06-223	Chemical Engineering Thermodynamics (Fall, Sophomore year; prereq: 06-100, 33-121/33-141/ 33-151)	12
06-261	Fluid Mechanics (Spring, Sophomore year; prereq: 06-223, 21-254)	9
06-262	Mathematical Methods of Chemical Engineering (Spring, Sophomore year; prereq: 06-223, 21-254)	12
06-323	Heat and Mass Transfer (Fall, Junior year; prereq: 06-261, 06-262/21-260, 33-122/33-142/33-152)	9
06-363	Transport Process Laboratory (Spring, Junior year; prereq: 06-261, 06-323)	9

### Electives

**27 units minimum**

Choose 27 units from the following ChemE and/or ENG courses with prerequisites in consultation with the concentration advisor:

06-310	Molecular Foundations of Chemical Engineering (Fall, Junior year; prereq: 06-223, 09-106)	9
06-325	Numerical Methods and Machine Learning for Chemical Engineering (Fall, Junior year; prereq: 06-262, 15-110/15-112)	6
06-326	Optimization Modeling and Algorithms (Fall, Junior year; prereq: 06-262)	6
06-364	Chemical Reaction Engineering (Spring, Junior year; prereq: 06-310, 06-323)	9
06-607	Physical Chemistry of Colloids and Surfaces (Senior year)	9
06-609	Physical Chemistry of Macromolecules (Fall, Senior year)	9
27-xxx	Materials Science course	9

Note: With advisor approval, electives can instead be other ChemE/ENG courses as long as they are taken in proper order to follow the required prerequisites, not allowing 06-421.

### BESA Free Electives

Take any Carnegie Mellon course. A maximum of 9 units of physical education and/or military science may be counted toward this requirement.