

# ELECTIVES

## Engineering & Science Electives

On the flowchart, there are four electives labeled: Advanced Science (ADV SCI) Elective, Engineering (ENG) Elective, Biochemistry (BIOCHEM) Elective, and Chemical Engineering (CHE) Elective. Each of these is restricted to a choice of at least 2 classes. Other courses may also be approved but require a petition to the ChBE faculty. Undergraduate research and honors internships/co-op fit under the courses designated "independent study." Up to 6 hours of independent study courses can be applied towards the B.S. degree in Chemical Engineering.

### Chemical and Biological Engineering Department Approved List

ChBE students must satisfy the 3 hours of Advanced Science, 3 hours of Engineering, 3 hours Biochemistry **AND** 3 hours Chemical Engineering electives by completing one of the following courses for each elective. A course may be used as an elective if it appears on the approved list which is current at the time the course is taken. One course cannot count in more than one place on the curriculum flowchart. Note: If you take a class that can fit into more than one elective slot, DegreeWorks will place it in one of the empty slots, and when you take additional electives, DegreeWorks will shift the classes so hours are optimized towards the degree.

#### Advanced Science (ADV SCI) Electives:

BSC 300 <sup>a</sup>	Cell Biology	3 hrs.
BSC 310 <sup>a</sup>	Microbiology (w/ permission)	3 hrs.
BSC 315 <sup>a</sup>	Genetics	3 hrs.
BSC 385 <sup>a</sup>	General Ecology	3 hrs.
BSC 442 <sup>a</sup>	Genomics (see instructor about waiving pre-reqs)	3 hrs
BSC 450 <sup>a</sup>	Fundamentals of Biochemistry	3 hrs.
MS 448	Introduction to Oceanography	4 hrs.
BSC 398, 399	Biology Research (Independent Study with Advisor)	variable hrs.
CH 223	Chemical Equilibria & Analyses	4 hrs.
CH 340	Physical Chemistry for Non-ACS	3 hrs.
CH 341	Physical Chemistry I	3 hrs.
CH 396, 398, 399	Chemistry Research (Independent Study with Advisor)	variable hrs.
CH 405	Medicinal Chemistry	3 hrs.
CH 461 <sup>b</sup>	Biochemistry I	3 hrs.
CH 462	Biochemistry II	3 hrs.
CH 424	Instrumental Analysis	4 hrs.
CH 497, 498, 499	Chemistry Research (Independent Study with Advisor)	variable hrs.
CE 470	Water Resources in the European Alps (study abroad)	4 hrs.
CHE 325	ChE Honors Forum	1 hr.
CHE 412	Polymer Materials Engineering	3 hrs.
CHE 414	Computer Methods in Chemical Engineering	3 hrs.
CHE 416	Stem Cell Bioengineering	3 hrs.
CHE 418	Tissue Engineering	3 hrs.

CHE 438	Integrated Circuit Fabrication Principles	3 hrs.
CHE 445	Introduction to Biochemical Engineering	3 hrs.
CHE 491,492 <sup>°</sup>	Special Problems (requires pre-approval)	variable hrs.
CHE 498 <sup>°</sup>	Honors Special problems (requires pre-approval)	variable hrs.
PH 253	Introduction to Modern Physics	3 hrs.
PH 495, 496 <sup>°</sup>	Physics Research (Independent Study with Advisor)	variable hrs.
Other UG Research	May be acceptable if in a technical subject.	

### Engineering (ENG) Electives

ECE 320	Fundamentals of Electrical Engineering	3 hrs.
MTE 271	Engineering Materials	3 hrs.

### Chemical Engineering (CHE) Electives:

CHE 412	Polymer Materials Engineering	3 hrs.
CHE 414	Computer Methods in Chemical Engineering	3 hrs.
CHE 416	Stem Cell Bioengineering	3 hrs.
CHE 418	Tissue Engineering	3 hrs.
CHE 438	Integrated Circuit Fabrication Principles	3 hrs.
CHE 445	Introduction to Biochemical Engineering	3 hrs.
CHE 491/492 <sup>°</sup>	Special Problems (requires pre-approval)	3 hrs.
CHE 497 <sup>°</sup>	Honors Co-op/Internship (requires pre-approval)	3 hrs.
CHE 498/499 <sup>°</sup>	Honors Special Problems (requires pre-approval)	3 hrs.

### Biochemistry (BIO) Electives:

BSC 450	Fundamentals of Biochemistry	3 hrs.
CH 461 <sup>°</sup>	Biochemistry I	3 hrs.
CHE 445	Intro to Biochemical Engineering	3 hrs.

### Notes

<sup>a</sup> Overrides can be given for ChBE students to take 300+-level BSC classes with only BSC 114 as a pre-req.

<sup>b</sup> An override is possible to take CH 461 without the pre-requisite CH 223. See your advisor.

<sup>c</sup> CHE 491/497/498/499 Independent study classes and CHE 492 Special Problems require approval and clearance. Contact the professor overseeing your independent study and the departmental office to remove the registration block on these classes.