

## Chemistry/Science/Technical Electives for Chemical and Biomolecular Engineering

### General Overview

Please check with Ms. Ellison if you are not sure whether a general petition is needed for any elective.

### Science Electives

Many NSM courses at the 3300-level or above (please see NSM Departments and courses offered: <https://uh.edu/nsm/departments/>). Pre-approved courses for which a general petition is not needed include:

BCHS 3304 (General Biochemistry)\*, BCBS 3305 (General Biochemistry II), BIOL 3301 (Genetics), BIOL 3306 (Evolutionary Biology), BIOL 3332 (Elementary Microbiology), BIOL 3341 (Human Genetics), GEOL 3370 (Mineralogy), GEOL 4330 (Intro To Geophysics), MATH 3338 (Probability), MATH 3363 (Intro to Partial Diff Eqns) MATH 3364 (Intro to Complex Analysis), MATH 3379 (Intro to Higher Geometry), PHYS 3315 (Modern Physics), as well as all pre-approved CHEM electives (see below).

Any approved Chemistry Elective (below) can instead serve as a Science Elective. A course cannot be counted as both a Science elective and a Chemistry elective.

The following are NOT approved electives:

**BIOL 4342, MATH 3304, MATH 3331**

**MATH 3339** is not approved unless completed prior to Fall 2023

### Chemistry Electives

Most CHEM courses at 3300-level or above and not already counted in the degree plan can be approved by petition to count as either a Chemistry Elective or a Science Elective.

Pre-approved CHEM electives (no petition necessary) include:

CHEM 3333 (Inorganic Chemistry), CHEM 3336 (Organic Chemistry of Biological Molecules), CHEM 3369 (Analytical Chemistry), CHEM 4336 (Fundamental Biochemistry)\*, CHEM 4364 (Advanced Organic Chem), CHEM 4365 (Inorganic Chemistry II) and CHEM 4369 (Analytical Chemistry 2).

In case of doubts, please check with Ms. Ellison or Dr. Cirino to ensure a course is / will be approved. A signed petition might be required.

Notes:

**CHEM 4370** and **CHEM 4373** are very similar to CHEE 3466 (required in our curriculum) so these CHEM courses **cannot count towards the degree.**

**CHEM 4330** (Polymer Chemistry) is an approved Science or Chemistry elective **only if** CHEE 5377 (Introduction to Polymer Science) is not also used as a Technical elective.

\*Students may take **either BCBS 3304 or CHEM 4336**. Either course will count as either a Science or a Chemistry elective. Credit will not be given for both courses.

## Technical Electives

All CHEE "53XX" courses are approved technical electives. Common technical elective courses that will not require a general petition are listed below. Most of these courses are offered less frequently than once per year. Please check the course listing.

CHEE 5323/6323 - Fundamentals of Tissue Engineering  
CHEE 5350 - Advanced Oxidation Processes for Aqueous Systems  
CHEE 5365/6365 - Fundamentals of Catalysis  
CHEE 5367/6367 – Advanced Process Control  
CHEE 5368/6368 - Chemical Process Economics I  
CHEE 5369/6369 - Chemical Process Economics II  
CHEE 5370 - Sustainability and Environmental Mitigation  
CHEE 5377 - Introduction to Polymer Science  
CHEE 5379/6379 - Safety and Reliability  
CHEE 5383 - Advanced Unit Operations  
CHEE 5384/6384 – Petrochemical Processes  
CHEE 5390 – Energy and the Environment  
CHEE 5397/6397 - Selected Topics in Biochemical Engineering  
CHEE 5397/6397 - Fundamentals of Modern Chemicals Mfg  
CHEE 5397/6397 - Chemical Engineering Fundamentals for CO<sub>2</sub>-free Mfg  
CHEE 6300 - Physics and Chemistry of Engineering Materials  
CHEE 6337 – Advanced Reactor Engineering  
CHEE 6360 - Biomolecular Engineering  
CHEE 6375 - Chemical Processing for Microelectronics

Select courses in other engineering departments, or in other colleges at UH (those with clear engineering content), can also be approved as technical electives. Check with the appropriate department for prerequisites, syllabus, and space availability.

Pre-approved non-CHEE technical electives include CIVE 6391 (Envrn Engr Microbiology), COSC 3337 (Data Science), ECON 3363 (Environmental Economics), ECON 3385 (Economics of Energy), ENRG 3310 (Introduction to Energy & Sustainability), GEOL 3342 (Principles of Air Pollution), INDE 3382 (Stochastic Models), PETR 3315 (Introduction to Well Logging), PETR 3362 (Reservoir Engineering I), PETR 53XX, and TECH 4310 (Future of Energy & Environment).

\*\* ENRG 3311 (Fundamentals of Sustainability) is **NOT** an approved elective.

\*\* Only one ENRG course may be applied toward the Technical Elective requirement.

Students can also earn technical elective credit for conducting research with a faculty member (as "Independent Study" (4398) or through Honors Thesis).

"Selected Topics" courses (4397 or 5397) offered by various Departments may be approved as Science or Technical Electives by general petition, depending on the specific course content.