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

Most BCHS, BIOL, CHEM, or PHYS courses at the 3300-level or above, or a pre-approved NSM course at the 3300-level or above. Pre-approved courses for which a general petition is not needed include:

- BCHS 3304 (General Biochemistry)*, BCHS 3305 (General Biochemistry II),
- BIOL 3301 (Genetics), BIOL 3306 (Evolutionary Biology),
- BIOL 3332 (Elementary Microbiology),
- GEOL 3370 (Selected Topic in Geology),
- GEOL 4330 (Intro To Geophysics),
- MATH 3338 (Probability), MATH 3379 (Intro to Higher Geometry) and
- PHYS 3315 (Modern Physics). In case of doubts, please check with a ChBE advisor to ensure its acceptance. A petition might be required to ensure the course will be counted toward the degree plan.

Notes:
- MATH 3331 is not an approved elective, as it is similar to CHEE 3321 (required in our curriculum).
- MATH 3339 (Statistics for the Sciences) is NOT an approved elective, unless this course was completed prior to Fall 2023 semester.

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).

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 BCHS 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
Common technical elective courses that will not require a general petition are listed below, by the semester when they are typically offered. Many of these courses are offered less frequently than once per year, and sometimes they are offered in an alternate semester. Please check the course listing.

**FALL**
- CHEE 5323/6323 - Fundamentals of Tissue Engineering
- CHEE 5350 - Advanced Oxidation Processes for Aqueous Systems
- CHEE 5368/6368 - Chemical Process Economics I
- CHEE 5384/6384 – Petrochemical Processes
- CHEE 5397/6397 - Selected Topics in Biochemical Engineering
- CHEE 5397/6397 - Advanced Wastewater Treatment Chem
- CHEE 5397/6397 - Fundamentals of Modern Chemicals Mfg
- CHEE 6300 - Physics and Chemistry of Engineering Materials
- CHEE 6397 - Phase Transitions in Solutions
- CHEE 7397 - Selected Topics - Microbiology in Medicine and Engineering
- CHEE 7397 - Selected Topics - Polymer Surfaces, Interfaces

**SPRING**
- CHEE 5323/6323 - Fundamentals of Tissue Engineering
- CHEE 5365/6365 - Fundamentals of Catalysis
- CHEE 5367/6367 – Advanced Process Control
- CHEE 5369/6369 - Chemical Process Economics II
- CHEE 5377 - Introduction to Polymer Science
- CHEE 5379/6379 - Safety and Reliability
- CHEE 5383 - Advanced Unit Operations
- CHEE 5397/6397 - Special Topics in Data Analytics
- CHEE 6337 – Advanced Reactor Engineering
- CHEE 6332 - Mathematical Methods in Chemical Engineering II
- CHEE 6360 - Biomolecular Engineering
- CHEE 6375 - Chemical Processing for Microelectronics

**SUMMER**
- CHEE 5384/6384 – Petrochemical Processes
- CHEE 5370 / 5397/6397 - Sustainability and Environmental Mitigation

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)**, ENRG 4397 (Energy and Sustainability), GEOL 3342 (Principles of Air Pollution), INDE 3382 (Stochastic Models), MECT 3341 (Computer-Aided Drafting I), 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.

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