

THE UNIVERSITY OF NORTH CAROLINA ASHEVILLE

FACULTY SENATE

Senate Document Number SD2024S

Date of Senate Approval 02/08/2024

Statement of Faculty Senate Action:

APC Document 13 (CHEM): Delete CHEM 312, replacing it with CHEM 317, 318, 319, and 320

Effective Date: Fall 2024

1. Delete: On page 115, the entry for **CHEM 312 - Interdisciplinary Chemistry Project Lab:**

312 Interdisciplinary Chemistry Project Lab (2)

A laboratory-based course in which students use the laboratory techniques and approaches of analytical, physical, organic, inorganic, computational, and biochemistry to conduct interdisciplinary project-based experiments that include synthesis, characterization, and analysis of chemical compounds and their properties. Scientific writing in this course will be a component of determining writing competency in the chemistry major. Students are required to take this course twice, but may not enroll in two sections involving the same projects. Prerequisites: CHEM 145, 222, 223, 231, 232, 233. Pre- or corequisites: CHEM 323, 331. Fall and Spring.

2a. Add: On page 115, new course, **CHEM 317, Biological Interdisciplinary Chemistry Project Lab:**

317 Biological Interdisciplinary Chemistry Project Lab (3)

A laboratory-based course in which students use the laboratory techniques and approaches of analytical, physical, organic, inorganic, computational, and/or biochemistry to conduct interdisciplinary project-based chemical biology related research that includes synthesis, characterization, and/or analysis of chemical compounds and their properties. Scientific writing in this course will be a component of determining writing competency in the chemistry major. Prerequisites: CHEM 145, 222, 223, 231, 232, 233. Pre- or corequisites: CHEM 323, 331. Fall and Spring.

2b. Add: On page 115, new course, **CHEM 318, Materials Interdisciplinary Chemistry Project Lab:**

318 Materials Interdisciplinary Chemistry Project Lab (3)

A laboratory-based course in which students use the laboratory techniques and approaches of analytical, physical, organic, inorganic, computational, and/or biochemistry to conduct interdisciplinary project-based materials related research that includes synthesis, characterization, and/or analysis of chemical compounds and their properties. Scientific writing in this course will be a component of determining writing competency in the chemistry major. Prerequisites: CHEM 145, 222, 223, 231, 232, 233. Pre- or corequisites: CHEM 323, 331. Fall and Spring.

2c. Add: On page 115, new course, **CHEM 319, Environmental Interdisciplinary Chemistry Project:**

319 Environmental Interdisciplinary Chemistry Project Lab (3)

A laboratory-based course in which students use the laboratory techniques and approaches of analytical, physical, organic, inorganic, computational, and/or biochemistry to conduct interdisciplinary project-based environmental chemistry related research that includes synthesis, characterization, and/or analysis of chemical compounds and their properties. Scientific writing in this course will be a component of determining writing competency in the chemistry major. Prerequisites: CHEM 145, 222, 223, 231, 232, 233. Pre- or corequisites: CHEM 323, 331. Fall and Spring.

2d. Add: On page 115, new course, **CHEM 320, Energy Interdisciplinary Chemistry Project Lab:**

320 Energy Interdisciplinary Chemistry Project Lab (3)

A laboratory-based course in which students use the laboratory techniques and approaches of analytical, physical, organic, inorganic, computational, and/or biochemistry to conduct interdisciplinary project-based energy related research that includes synthesis, characterization, and/or analysis of chemical compounds and their properties. Scientific writing in this course will be a component of determining writing competency in the chemistry major. Prerequisites: CHEM 145, 222, 223, 231, 232, 233. Pre- or corequisites: CHEM 323, 331. Fall and Spring.

Impact Statement: In CHEM 317, 318, 319, and 320, students will research specific interdisciplinary projects. Students will be required to take two of the new courses, and they will replace the two CHEM 312 courses required in the current curriculum. The anticipated class size is 20-30 BA and BS chemistry students per semester. The class meets for two 3-hour periods per week, at 6 faculty contact hours. The class format is a majority laboratory work with short lectures during the early part of the semester. The addition of distinct topic courses will reduce scheduling confusion for students by having distinct course numbers and topics listed.

This change will increase the number of credit hours in the BS and BA chemistry major by 2 credit hours but will not increase faculty contact hours. The change will result in a possible reduction of the number of potential elective credit hours students take.

BS/BA Chemistry Major Curriculum Change

Old: Students took 2 distinct 312 courses totaling 4 credit hours.

New: Students will choose 2 distinct Interdisciplinary Project Lab courses from a total of 4 choices (317, 318, 319, or 320) totaling 6 credit hours. Students under pre-2024 catalog requirements who have not taken two sections of CHEM 312 will take one or two of the new courses to complete the two-course requirement.

Rationale: CHEM 312 is an upper-level laboratory course, taught as a course-based undergraduate research experience, that applies concepts and skills from more than one foundational area of chemistry to an interdisciplinary research project. The course has been offered since Fall 2016 and is a distinctive feature of our curriculum. The research-based nature of the course has many benefits for students but necessarily requires more student work than a traditional lab experience. The proposed increase in credit hours for the CHEM 312 replacement courses from 2 to 3 credit hours will more accurately reflect current expectations for student effort in the courses in order to execute a meaningful project. Compared to lower-level lab courses, Interdisciplinary Project Lab courses have higher expectations for out-of-lab work for literature research, proposal preparation (written or oral), data analysis, and interpretation and presentation of research results (written or oral). Additionally, as the capstone laboratory experience in the BA degree track and final teaching lab in the BS degree track, assessment of departmental SLOs

related to laboratory skills and professional behaviors occurs in CHEM 312 (and will continue in the replacement courses) and is mostly based on the products of students' out-of-class effort. The addition of distinct topic courses with credit hours increasing from 2 to 3 will accurately reflect the course workload.