

THE UNIVERSITY OF NORTH CAROLINA ASHEVILLE

FACULTY SENATE

Senate Document Number SD2224S

Date of Senate Approval 02/08/2024

Statement of Faculty Senate Action:

APC Document 15 (CHEM): Change the major requirements for the BA and BS degrees in Chemistry

Effective Date: Fall 2024

1. Delete: On pages 112-113, the entry under **Bachelor of Science Degree:**

- I. Required courses for the major—42 hours, including: CHEM 111, 132, 145, 222, 223, 231, 232, 233, 323, 331, 380, 416, 417, 418; 4 hours of 312; and 9 hours of CHEM at the 400-level.
- II. Required courses outside the major—16-20 hours, including MATH 191 (requires completion of MATH 167 or placement), 192; PHYS 221 and either PHYS 222 or 231.
- III. Other departmental requirements—Major competency is demonstrated in CHEM 416. The course must be completed with a grade of C or higher to graduate. A grade of C or higher in CHEM 145, 222, 223, 231, 232, 233, 323, and 331 and a GPA of 2.30 in all chemistry courses required for the major is required to graduate.

Add: On pages 112-113, in place of deleted entry:

- I. Required courses for the major—46 hours, including: CHEM 111, 132, 145, 222, 223, 231, 232, 233, 323, 331, 395, 416, 417, 418; 6 hours from CHEM 317, 318, 319, and 320; and 9 hours of CHEM at the 400-level, excluding CHEM 411 and 499.
- II. Required courses outside the major—16-20 hours, including MATH 191 (requires completion of MATH 167 or placement), 192; PHYS 221 and either PHYS 222 or 231.
- III. Other departmental requirements—Major competency is demonstrated in CHEM 416. The course must be completed with a grade of C or higher to graduate. A grade of C or higher is also required in CHEM 145, 222, 223, 231, 232, 233, 323, and 331, as is a cumulative GPA of at least 2.30 in all required chemistry courses.

2. Delete: On page 113, the entry under **Bachelor of Arts Degree:**

- I. Required courses for the major—at least 38 hours, including: CHEM 111, 132, 145, 222, 223, 231, 232, 233, 323, 331, 409; 4 hours of 312; and 6 hours of CHEM, BIOL, and/or ENVR at the 300-400 level, with the following exceptions: CHEM 390, 411, 499, BIOL 398, 480, 498, 499, and ENVR 490 and 499. The approved BIOL and ENVR courses require prerequisites.
- II. Required courses outside the major—16-20 hours, including MATH 191 (requires completion of MATH 167 or placement), 192; PHYS 221, and either PHYS 222 or 231.
- III. Other departmental requirements—Major competency is demonstrated in CHEM 409. The course must be completed with a grade of C or higher to graduate.

Add: On page 113 in place of deleted entry:

- I. Required courses for the major—at least 40 hours, including: CHEM 111, 132, 145, 222, 223, 231, 232, 233, 323, 331, 409; 6 hours from CHEM 317, 318, 319, and 320; and 6 hours of CHEM, BIOL, and/or ENVR at the 300-400 level, with the following exceptions: CHEM 390, 411, 416, 417, 418, 499, BIOL 398, 480, 498, 499, and ENVR 490 and 499. The approved BIOL and ENVR courses require prerequisites.
- II. Required courses outside the major—16-20 hours, including MATH 191 (requires completion of MATH 167 or placement), 192; PHYS 221, and either PHYS 222 or 231.
- III. Other departmental requirements— Major competency is demonstrated in CHEM 409. The course must be completed with a grade of C or higher to graduate.

Impact Statement: There will be no impact on staffing and resources in the Department of Chemistry and Biochemistry due to the changes to CHEM 312 (now CHEM 317, 318, 319, and 320) and CHEM 380 (now CHEM 395) because the faculty contact hours are remaining the same.

The BS and BA Chemistry degrees will increase by 4 and 2 credit hours, respectively, due to the requested changes; however, this increase in credit hours will better reflect the student workload already required for these courses allowing for a better alignment of student and instructor expectations. For BS Chemistry majors this will reduce their number of available elective credits by 1 course, but will not increase the major requirements for the major plus LAC requirements above the 100-hour credit cap if students utilized courses required for the major and that satisfy LAC requirements (Lab Science – CHEM 132/111, Scientific Perspective – CHEM 323, Quantitative – MATH 191, and DI – CHEM 446). There will be minimal impact on current students who are partway through the chemistry curriculum and direct course substitutions for CHEM 312 and CHEM 380 will be applied with the new courses described as shown.

Current Curriculum BS Major		New Curriculum BS Major	
Course	Credit Hours	Course	Credit Hours
CHEM 132	3	CHEM 132	3
CHEM 111	1	CHEM 111	1
CHEM 231	3	CHEM 231	3
CHEM 233	3	CHEM 233	3
CHEM 145	1	CHEM 145	1
CHEM 232	3	CHEM 232	3
CHEM 222	2	CHEM 222	2
CHEM 223	3	CHEM 223	3
CHEM 331	3	CHEM 331	3
CHEM 323	3	CHEM 323	3
CHEM 312	2	CHEM 317/318/319/320	3
CHEM 312	2	CHEM 317/318/319/320	3
CHEM 380	1	CHEM 395	3
CHEM 416	1	CHEM 416	1
CHEM 417	1	CHEM 417	1
CHEM 418	1	CHEM 418	1
CHEM 4xx	9	CHEM 4xx	9
Total	42	Total	46
Other non-LAC Required Courses	16	Other non-LAC Required Courses	16
Total Major Requirements	58	Total Major Requirements	62
Total Major Requirements with	90-98	Total Major Requirements with	94-102

LAC not in the major course load		LAC not in the major course load	
		New Curriculum BA Major	
Course	Credit Hours	Course	Credit Hours
CHEM 132	3	CHEM 132	3
CHEM 111	1	CHEM 111	1
CHEM 231	3	CHEM 231	3
CHEM 233	3	CHEM 233	3
CHEM 145	1	CHEM 145	1
CHEM 232	3	CHEM 232	3
CHEM 222	2	CHEM 222	2
CHEM 223	3	CHEM 223	3
CHEM 331	3	CHEM 331	3
CHEM 323	3	CHEM 323	3
<i>CHEM 312</i>	2	<i>CHEM 317/318/319/320</i>	3
<i>CHEM 312</i>	2	<i>CHEM 317/318/319/320</i>	3
CHEM 409	3	CHEM 409	3
CHEM 4xx, BIOL 3/4xx, or ENVR 3.4xx	6	CHEM 4xx	6
Total CHEM	38	Total CHEM	40
Other non-LAC Required Courses	16	Other non-LAC Required Courses	16
Total Major Requirements	54	Total Major Requirements	56
Total Major Requirements with LAC not in the major course load	86-94	Total Major Requirements with LAC not in the major course load	88-96

Rationale: To better align the credit hours with workload expectations and to meet new American Chemical Society certification requirements, a Chemical Research Methods and Ethics course (CHEM 395, 3 credits) will be developed to replace the current Chemical Research Methods course (CHEM 380, 1 credit), and research specific Interdisciplinary Project Labs CHEM 317, 318, 319, and 320 (3 credits each, students will take two) will be developed to replace the two courses of General Interdisciplinary Project Lab CHEM 312 (2 credits). These changes will increase the BA Chemistry degree from 54 to 56 required credit hours and the BS Chemistry degree from 58 to 62 required credit hours. For the BS Chemistry Majors, increasing the credit hours in the new CHEM 395 course compared with the previous CHEM 380 course will allow the curriculum to meet the new requirements for the American Chemical Society accreditation of this degree. For both BA and BS Chemistry Majors, increasing the credit hours for CHEM 317/318/319/320 will allow for a more robust research experience which has become a critical component of students' resumes for industry positions, graduate school and professional school acceptances. Additionally, increasing from 4 hours of upper-level laboratory credit to 6 hours of upper-level laboratory credit better aligns with curriculum at similar institutions as outlined in petition for credit limit exemption document provided. The CHEM 416/417/418 sequence will not count as credits towards the 6 hours of 300-400 level courses in the BA major because they serve as a capstone experience. Therefore, if a student changes from a BS to a BA major having already completed the CHEM 416/417/418 sequence this will count as a replacement for CHEM 409, which is the capstone course in the BA curriculum.

Link to 2023 ACS Guidelines: <https://www.acs.org/content/dam/acsorg/education/standards-guidelines/approval-program/guidelines-draft-sept2022.pdf>