THE UNIVERSITY OF NORTH CAROLINA ASHEVILLE
FACULTY SENATE

Senate Document Number SD2823S
Date of Senate Approval 03/30/2023

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Statement of Faculty Senate Action:

APC Document 18 (ENVR): **Delete the 4-credit ENVR 362, Water Chemistry and replace it with a new 3-credit course, ENVR 363, Environmental Geochemistry;**
Add new course, ENVR 366, Exotic Invasive Plant Management;
Editorial changes resulting from the deletion of ENVR 362, and the addition of ENVR 363 and 366;
Change the offering pattern for ENVR 365

Effective Date: Fall 2023

1. Delete: On page 159, the entry for **ENVR 362, Water Chemistry**:

362 Water Chemistry (4)
Application of chemical principles to natural waters including oceans, lakes, streams, and groundwater to examine the effects of human activity on water chemistry. Laboratory exercises emphasize computer modeling and the collection, analysis, and interpretation of water chemistry data. Prerequisites: CHEM 132; ENVR 130. Odd years Spring.

Add: On page 159, new course, **ENVR 363, Environmental Geochemistry:**

363 Environmental Geochemistry (3)
Introduction to the chemicals and chemical processes that affect water quality in natural and contaminated systems. Basic principles and practical real-world examples will be used to demonstrate how water chemistry is impacted by both human activity and natural interactions with rocks, soil, and the atmosphere. Hands-on activities will focus on the collection, analysis, and interpretation of water chemistry data. Prerequisites: CHEM 132; ENVR 130. Odd years Spring.

Impact: We would like to delete ENVR 362 and add ENVR 363 as a permanent offering in our department. The proposed change from a 4-credit to a 3-credit course will decrease future staffing needs from six to three contact hours every two years, which will allow Dr. Wilcox to teach other needed courses in our department.

Students in our Earth Science concentration are required to take six elective hours, so in nearly all cases, they will still need to take the same number of courses to graduate. In addition, reducing the credit hours for this course may encourage (or allow) more students to take the course, as not all students are able to commit to a 4-credit-hour elective.

There will be no significant impact on department resources if we offer a 3-credit version of the course, as laboratory expenses will remain the same. There may be a savings on field trip expenses, as students may take fewer trips. ENVR 362, Water Chemistry, is a 4-credit upper-level elective course open to all ENVR majors (though the majority of students are from the Earth Science concentration), and ENVR 363 will serve the same purpose.

Student learning objectives:

1. Define and use key terms in the field of environmental geochemistry.
2. Use thermodynamics to explain and predict geochemical reactions in the environment.
3. Explain naturally-occurring chemical processes and how humans have affected the occurrence and distribution of chemicals in surface and groundwater.
4. Collect and analyze water samples using appropriate methods and instrumentation.
5. Interpret basic geochemical data and convey geochemical information in oral and written formats.

Rationale: In order to offer enough classes and seats for our large number of majors, a few years ago several ENVR faculty began offering lecture-lab hybrid courses that incorporate lab experiences into a 3-credit-hour (3-contact-hour) course. In lieu of ENVR 362, Water Chemistry, Dr. Jeff Wilcox designed a 3-credit version of this course (ENVR 373, Environmental Geochemistry) that was offered in Spring 2019 (enrolled 13 students; course limit of 13) and Spring 2021 (enrolled 10 students; course limit of 13), and is being offered again in Spring 2023 (enrolled 10 students; course limit of 13). The change in course name reflects a change in focus to applied geochemical principles and methods used in environmental consulting—a field where many of our graduates are employed. The 3-credit version works well, and allows Dr. Wilcox to teach a wider variety of courses in our department, as it requires three contact hours instead of six.

The proposed change will allow the Environmental Studies Department to continue offering a valuable hands-on course while decreasing the number of committed faculty contact hours.

2. Add: On page 159, new course, **ENVR 366, Exotic Invasive Plant Management:**

366 Exotic Invasive Plant Management (4)
An introduction to the identification and management of exotic invasive plants. Topics and activities include identification, mechanical and chemical control methods, seedbanks, management plans, and ecosystem restoration. Prerequisite: ENVR 130 or permission of instructor. Even years Spring.

Impact: This course, which will be taught by Dee Eggers, will count as an ENVR lab elective for students in our Environmental Management and Policy concentration, as an advanced ecology elective for students in our Ecology concentration, and as an advanced ENVR course for ENVR minors. We would like to make the 4-credit lab version a part of her regular teaching rotation, which will not affect the availability of other courses currently in the catalog. Providing a regular rotation for this course will let interested students know ahead of time when the course will be offered, allowing them to plan their schedules accordingly.

Making this course a permanent offering will have minimal staffing or budgetary impacts on the ENVR department. The ENVR department and Dr. Eggers have been paying for the supplies for this course for several years, and ENVR maintains a supply of field and lab equipment that is used in many environmental studies courses. The outdoor activities for this course take place on campus with no need for off-campus trips, so no travel expenses will be incurred.

Student learning objectives:

1. Identify common exotic invasive plants of the Southern Appalachians;
2. Develop hands-on skills through applying multiple chemical and mechanical control methods;
3. Describe methods of prevention and ecosystem restoration;
4. Understand relevant state and federal policies governing invasive; and,
5. Create management plans for invaded areas.

Rationale: Dr. Eggers has offered Special Topics variations of this course since 2014, including courses numbered 371 (lab only), 373 (hybrid lab/lecture), and 374 (lab + lecture) with strong enrollment.

Spring 2014 (1 credit) – 19 students (20 seats available)
Fall 2014 (1 credit) – 13 students (20 seats available)
Fall 2015 (1 credit) – 15 students (20 seats available)
Spring 2017 (4 credits) – 15 students (20 seats available)
Spring 2019 (4 credits – 17 students (20 seats available)
Spring 2021 (4 credits) – 20 students (20 seats available)
Spring 2022 (3 credits) – 20 students (20 seats available)
Students in our Environmental Management and Policy concentration are required to take a 4-credit lab course, and students in the Ecology concentration are required to complete 18 hours of advanced ecology electives. This course will contribute to both requirements. In addition, this course will provide job readiness skills in a field of rapidly growing demand, and will directly benefit our campus, as students use the campus as an outdoor lab for invasive plant removal in open spaces.

3a. **Delete:** On page 104, under the requirements for the B.S. degree in Chemistry, the first bullet entry:

- Students interested in an environmental chemistry focus are recommended to take CHEM 439 and 6 hours of CHEM at the 400-level across chemistry subdisciplines as their required 9 hours of CHEM at the 400-level. Students are also recommended to take 2 additional courses in Environmental Studies (ENVR 130 and one course from ENVR 320, 338, ~~362~~, 385 or a course recommended by the Chair of Chemistry). This focus is recommended for students wishing to obtain employment in an environmental related field or pursue graduate studies in environmental chemistry.

Add: On page 104, in place of deleted entry:

- Students interested in an environmental chemistry focus are recommended to take CHEM 439 and 6 hours of CHEM at the 400-level across chemistry subdisciplines as their required 9 hours of CHEM at the 400-level. Students are also recommended to take 2 additional courses in Environmental Studies (ENVR 130 and one course from ENVR 320, 338, 363, 385 or a course recommended by the Chair of Chemistry). This focus is recommended for students wishing to obtain employment in an environmental related field or pursue graduate studies in environmental chemistry.

3b. **Delete:** On page 154, under **Concentration in Earth Science:**

At least 29 hours distributed as follows: ENVR 105, 106, 320, 338, 381, 385 and at least 6 additional hours of Earth Science electives chosen from ENVR 282 (if not selected to fulfill the departmental core requirement), 290, 310, 311, ~~362~~, 383, 384, 410, 411. Students interested in mineral processing should take ENVR 311, 410, 411 and MATH 191 as part of their major requirements. Students wishing to seek a North Carolina Professional License in Geology should take 24 credit hours of upper-level earth science classes.

Add: In page 154, in place of deleted entry:

At least 29 hours distributed as follows: ENVR 105, 106, 320, 338, 381, 385 and at least 6 additional hours of Earth Science electives chosen from ENVR 282 (if not selected to fulfill the departmental core requirement), 290, 310, 311, 363, 383, 384, 410, 411. Students interested in mineral processing should take ENVR 311, 410, 411 and MATH 191 as part of

their major requirements. Students wishing to seek a North Carolina Professional License in Geology should take 24 credit hours of upper-level earth science classes.

3c. **Delete:** On page 154, under Concentration in Ecology and Environmental Biology

At least 28 hours distributed as follows: BIOL 210 or 211; one course from ATMS 103, ENVR 105, 106, 338, ~~362~~, 385, CHEM 231 (if not selected to fulfill the departmental chemistry requirement) or PHYS 131; one 3-4 hour advanced ENVR elective; and 18 hours of Ecology and Biology electives chosen from BIOL 210 or 211 (whichever is not selected above), 320, 322, 323, 331, 332, 334, 335, 350, 351, 356, 357, 360, 442; or ENVR 302, 312, 322, 323, 341, 343, 346, 347, 348, 349, 351, 352, 358, 360, 390, 391, 396, 397. The 18 hours must include at least three 4-credit courses; and at least 11 of the 18 hours must be taken in ENVR.

Add: On page 154, in place of deleted entry:

At least 28 hours distributed as follows: BIOL 210 or 211; one course from ATMS 103, ENVR 105, 106, 338, 363, 385, CHEM 231 (if not selected to fulfill the departmental chemistry requirement) or PHYS 131; one 3-4 hour advanced ENVR elective; and 18 hours of Ecology and Biology electives chosen from BIOL 210 or 211 (whichever is not selected above), 320, 322, 323, 331, 332, 334, 335, 350, 351, 356, 357, 360, 442; or ENVR 302, 312, 322, 323, 341, 343, 346, 347, 348, 349, 351, 352, 358, 360, 366, 390, 391, 396, 397. The 18 hours must include at least three 4-credit courses; and at least 11 of the 18 hours must be taken in ENVR.

3d: **Delete:** On pages 154-155, under **Concentration in Environmental Management and Policy:**

At least 33 hours distributed as follows: ECON 103, 339; ENVR 332, 334; 6 hours chosen from ENVR 234, 324, 333, 360, 365, 383, 391; 7 hours at the 300-400 level, with at least 4 hours chosen from ENVR 302, both 322 and 323, 338, 341, 343, 346, 347, 348, 349, 351, 352, 358, ~~362~~, 384, 385, 390, 396, 397; and 6 hours of environmental policy and management-relevant coursework, with at least 3 hours at the 300-400 level. The courses approved for this requirement are listed on the department's website. They may not be double-counted to meet other requirements for the Environmental Management and Policy concentration.

Add: On pages 154-155, in place of deleted entry:

At least 33 hours distributed as follows: ECON 103, 339; ENVR 332, 334; 6 hours chosen from ENVR 234, 324, 333, 360, 365, 383, 391; 7 hours at the 300-400 level, with at least 4 hours chosen from ENVR 302, both 322 and 323, 338, 341, 343, 346, 347, 348, 349, 351, 352, 358, 366, 384, 385, 390, 396, 397; and 6 hours of environmental policy and management-relevant coursework, with at least 3 hours at the 300-400 level. The courses approved for this requirement are listed on the department's website. They may not be double-counted to meet other requirements for the Environmental Management and Policy concentration.

Impact: ENVR 363 is replacing ENVR 362 in the recommended courses for the B.S. degree in Chemistry, and the Earth Science and Ecology and Environmental Biology concentrations in Environmental Studies, and ENVR 366 is being added to the advanced ecology list for Ecology and Environmental Biology, and the 4-credit lab option for Environmental Management and Policy students.

Rationale: These are editorial changes to incorporate ENVR 363 and 366 into the list of courses for ENVR students.

4. **Delete:** On page 159, the offering pattern for **ENVR 365, Strategies for Sustainability:**

365 Strategies for Sustainability (3)
Introduction to the study of institutional change and improved environmental performance. Focus on manufacturers, large institutions such as universities and hospitals, and the built environment. Prerequisite: ENVR 334. Even years Spring.

Add: On page 159, in place of deleted entry:

365 Strategies for Sustainability (3)
Introduction to the study of institutional change and improved environmental performance. Focus on manufacturers, large institutions such as universities and hospitals, and the built environment. Prerequisite: ENVR 334. Even years Fall.

Impact: This change will not impact major, minor, or university requirements, and will have no impact on departmental or university resources.

Rationale: Dee Eggers teaches ENVR 365 every other year; it has strong enrollment and counts towards required elective credits for students in our Ecology and EMP concentrations. Changing its rotation from Even Years Spring to Even Years Fall will allow Dr. Eggers to teach the proposed Exotic Invasive Plant Management course during alternating Spring semesters (late winter and early spring are the ideal times to treat and control invasive plants). Given her overall teaching obligations, Dr. Eggers will be unable to teach both courses in the Spring.