Senate Document Number   SD2622S
Date of Senate Approval   2/03/2022

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Statement of Faculty Senate Action:

APC Document 22 (ENVR):   **Delete ENVR 312 and add new course, ENVR 326, Air Pollution Formation and Impacts, cross-listing it with ATMS 326; Add new course, ENVR 344, Urban Ecology**

Effective Date: Fall 2022

1.   **Delete:** On page 151, the entry for **ENVR 312:**

    312   **Effects of Air Pollution on Ecosystems (3)**
      Through the use of textbooks and primary literature we will examine the effects on ecosystems of such air pollutants as acid deposition, nitrogen loading in soils, and greenhouse gases. The class will be discussion based. Prerequisites: CHEM 132; ENVR 130, 241. See department chair.

2a.   **Add:**   On page 152, new course, **ENVR 326, Air Pollution Formation and Impacts:**

    326   **Air Pollution Formation and Impacts (ATMS 326) (3)**
      An overview of air pollution history, major pollutants, and relevant environmental policies and regulations. Prerequisite: One course from ATMS 103, 113, or ENVR 130. Odd years Spring.

2b.   **Add:**   On page 89, new course, **ATMS 326, Air Pollution Formation and Impacts:**

    326   **Air Pollution Formation and Impacts (ENVR 326) (3)**
      An overview of air pollution history, major pollutants, and relevant environmental policies and regulations. Prerequisite: One course from ATMS 103, 113, or ENVR 130. Odd years Spring.

Impact: The addition of this course will not require any new resources from ATMS or ENVR. Dr. Evan Couzo was recently given a joint appointment in ATMS and EDUC, and he will be the course instructor. There is no other equally qualified UNCA faculty to teach the course, but there are likely adjuncts in the community associated with NOAA and the National Climatic Data Center in Asheville who can teach it if Dr. Couzo is unable to do so. We anticipate a growing number of ATMS students will enroll in this course. Chris Hennon (Chair of ATMS) has confirmed it will become part of Dr. Couzo's regular course offerings. By offering the course on a regular rotation, students will be able to plan ahead to take advantage of this course offering and meet their graduation requirements in a timely manner. The course will count as an advanced ENVR elective for students in the major and minor. For ATMS majors, the course will count as an elective towards their degrees.

Student learning objectives:
1. Understand how air pollution affects human health;
2. Be able to describe the characteristics of air pollution formation, including photochemical chemical mechanisms and aerosol growth;
3. Be able to trace the evolution of air pollution management, including major provisions in the Clean Air Act and other important US regulatory efforts;
4. Understand solutions to air pollution challenges, including acid rain and stratospheric ozone depletion.

Anticipated class size will be 15 ENVR students and 5 ATMS students.
Scheduled class time – 2 x week for 75/min = total 150 min/week
Course format = lecture.
No specialized space or material needs.
3 contact hours when taught, so 3 faculty workload hours
As an upper-level course, it is not part of the Common Numbering System, and is not a good candidate, as it is not likely to be offered at many other institutions.

Rationale: The Environmental Studies Department is sunsetting ENVR 312 (Air Pollution Effects on Ecosystem) which was last taught by Kitti Reynolds in Fall 2014 (prior to her retirement). Since Dr. Couzo is a physical scientist, his course is not an ecological study of ecosystems, so is not the same course. The proposed course brings additional breadth in physical sciences to the Environmental Studies curriculum, and complements the environmental policy focus of our EMP concentration. In addition, this course will be a welcome permanent addition to the ATMS curriculum, as Air Pollution Meteorology is consistent with the requirements for employment in the U.S. government as a meteorologist (OPM-1340).

This course has been taught as a Special Topics three times since 2017. Each time, it was cross-listed in ATMS, to make it available to students in both departments. The enrollment history shows a steady rise in enrollment each time it has been offered.

	ENVR 373		ATMS 373		
Semester	Enrolled	Total seats	Enrolled	Total seats	Total enrollment
Spring 2017	6	6	3	6	9
Spring 2019	11	13	1	5	12
Spring 2021	15	15	2	5	17

3. **Add:**   On page 153, new course, **ENVR 344, Urban Ecology:**

344   Urban Ecology (3)
An introduction to the study of urban areas as complex ecosystems. Explores how urban areas affect, and are affected by, ecosystem processes, climate, biodiversity, and evolution. Prerequisite: ENVR 241 or instructor permission. Even years, Spring.

Impact: This 3-hour course counts as an advanced ecology elective for students in our Ecology concentration, and as an advanced ENVR course for majors in our other concentrations and for ENVR minors. Making the course a permanent offering will have minimal staffing or budgetary impacts on the ENVR department. Dr. Andrew Laughlin has taught this course as a Special Topics offering twice, and is scheduled to teach it again in Spring 2022. The course will be taught every other spring as part of his regular teaching schedule.

ENVR maintains a supply of field and lab equipment that is used in many environmental studies courses, and only minimal supplies will be needed to replenish the departmental inventory (e.g., DBH tapes, tape measures, kick nets). The outdoor activities for this course, which include an introduction to urban trees and a survey of urban streams, can take place on campus with no need for off-campus trips, so travel expenses will not be incurred.

Student learning objectives:

1. Gain knowledge in how urban areas affect, and are affected by, ecological processes;
2. Define central terms, concepts, and theories related to ecology in, of, and for cities;
3. Describe patterns and drivers of biodiversity and evolution in urban areas;
4. Identify trees, birds, mammals, and arthropods common to urban areas.

Anticipated class size will be 20.
Scheduled class time – 2 x week for 75/min = total 150 min/week
Course format = lecture with some hands-on work during class.
No specialized space or material needs.
3 contact hours when taught, so 3 faculty workload hours
As an upper-level course, it is not part of the Common Numbering System, and is not a good candidate, as it is not likely to be offered at many other institutions.

Rationale: This course has been taught twice as a Special Topics course, and is scheduled to be taught a third time in Spring 2022. It has had strong enrollment the two times it's been offered.

Spring 2017 – 16 students enrolled (20 seats available)
Spring 2020 – 21 students enrolled (20 seats available + 1 overage)
Spring 2022 – TBD students enrolled (20 seats available)

Students in our Ecology concentration are required to complete 18 hours of advanced ecology electives. Many elective offerings are 4-hr courses that include both lecture and lab components. Urban Ecology will fill an important niche, as it is often advantageous for students to also have 3-hr ecology options for scheduling purposes in order to reach that requirement. In addition, Urban Ecology is one of the few ecosystem-level courses we offer in ENVR, in which students are exposed to both biotic and abiotic interactions. As such, it ties together material from across our discipline, including hydrology, soils, and urban climate, in addition to the urban forest, wildlife, and biodiversity.

2. **Delete:** On page 149, the entry 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 149, 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, 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, 322, 323, 341, 343, 344, 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.

Impact: ENVR 312 is being removed and ENVR 344 is being added to give students another advanced ecology elective from which to choose.

Rationale: This is an editorial change to incorporate ENVR 344 into the list of advanced ecology electives.