EA 503 ENVIRONMENTAL EXPOSURE ASSESSMENT (3 Credits)

COURSE SYLLABUS

COURSE INSTRUCTORS

Dr. Chris Hofelt, Teaching Assistant Professor
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COURSE DESCRIPTION

Provides students with an appreciation and understanding of the principles of environmental exposure assessment including the sources, transport and fate of chemicals in the environment. Emphasis is on contemporary problems in human health and the environment, covering topics such as: transformation and degradation processes, classes of contaminants as well as predicting environmental fate and exposure.

PREREQUISITES

1 year college biology and 1 year college chemistry

STUDENT LEARNING OUTCOMES

By the end of this course, students will be able to:

1. Identify and apply the fundamental principles of environmental chemistry that are essential to understanding environmental exposure assessment.
2. Explain how and why chemical persist and move within the environment.
3. Apply these scientific principles to investigate environmental problems, quantitatively predict and model chemical exposure and effect, and assess risk.
4. Explain the complexity of these issues and evaluate the variability and uncertainty in environmental toxicology and chemistry assessments.

TEXTBOOK

Connell, D. Basic Concepts of Environmental Chemistry (2nd ed.) 2005 CRC pPress. $90

Delivery: (Web-assisted) Lectures are recorded PowerPoints that are hosted on NC State’s Moodle® course Management System (CMS) as both Adobe Flash® files as well downloadable IPod® files.
**COURSE ORGANIZATION AND SCOPE**

**Online Lectures**

1. Introduction (Where does this fit in to the RA paradigm)
2. Properties of Chemicals (physico-chemical properties, etc.) (Ch 2)
3. Transformation and Degradation Processes (Ch 3)
4. Biotransformation processes (Ch 4)
5. Atmospheric Chemistry Processes (Ch 12)
6. Chemistry of Natural Waters (Ch 13)
7. Chemistry of Natural Waters: Nutrient Enrichment and Eutrophication (Ch 13)
8. Groundwater
9. What is Exposure: portals of entry (Ch. 4)
10. Contaminants in the Environment: Petroleum Hydrocarbons (Ch 5)
11. Contaminants in the Environment: PCBs and Dioxins (Ch 6)
12. Contaminants in the Environment: Synthetic Polymers (Ch 7)
13. Contaminants in the Environment: Pesticides (Ch 8)
14. Contaminants in the Environment: PAHs (Ch 9)
15. Contaminants in the Environment: Soaps and Detergents (Ch 10)
16. Contaminants in the Environment: Inorganic Toxicants (Ch 11)
17. Contaminants in the Environment: Endocrine Disruptors
18. Predicting Environmental Fate and Effects
19. Predicting Environmental Fate and Effects: Air Dispersion Modeling
20. Predicting Environmental Fate and Effects: groundwater Modeling
21. Predicting Environmental Fate and Effects: EPA’s HHRAP approach
22. EPA exposure models
23. Detection of Pollutants (Ch 17)
24. Calculating the Exposure Point Concentration

**MID-TERM EXAM**

25. Predicting Environmental Fate and Effects: EPA’s HHRAP approach
26. EPA exposure models
27. Detection of Pollutants
28. Calculating the Exposure Point Concentration

**FINAL EXAM**

**SCHEDULE OF READING ASSIGNMENTS**

Reading assignments will coincide with each lecture in the syllabus. Lectures with no reading assignments listed may have additional handouts with reading material.

**SCHEDULE OF HOMEWORK AND EXAMS**

Quizzes will correspond with each lecture and will be available online. There will be two exams that will each cover roughly ½ of the lecture material. The exams will be a take-home format and they are given a minimum of 2 weeks to complete the exam.

**GRADING**

Student performance will be evaluated based on the quizzes and examinations as follows:

- Quizzes: 20%
- Exam 1: 40%
- Final: 40%
Because the exams are in a take-home format and students are given a minimum of two weeks to complete the exam, makeup exams will not be given.

Final letter grades will be determined as follows:

- A+ = 97.0-100.0
- A  = 91.5-96.9
- A-  = 89.5-91.4
- B+  = 87.5-89.4
- B   = 81.5-87.4
- B-  = 79.5-81.4
- C+  = 77.5-79.4
- C   = 71.5-77.4
- C-  = 69.5-71.4
- D+  = 67.5-69.4
- D   = 61.5-67.4
- D-  = 59.5-61.4
- F   = <59.5

ATTENDANCE

As this is a distance education course, there is not a traditional attendance policy. However, students are strongly encouraged to view all online content on a routine and timely basis.

ACADEMIC INTEGRITY

Students are expected to be familiar with and honor the NCSU Code of Student Conduct. An honor pledge will be placed on all examinations and some assignments for students to sign. For additional information, visit: [http://www.ncsu.edu/policies/student_services/student_discipline/POL11.35.1.php](http://www.ncsu.edu/policies/student_services/student_discipline/POL11.35.1.php)

ADVERSE WEATHER POLICY

Although the material is all online, if the university is officially closed for weather related emergencies, reasonable accommodation will be made for students that are not able to access the online material. More information about the University’s weather policy can be found on the NCSU website: [http://www.ncsu.edu/policies/campus_environ/health_safety_welfare/REG04.20.7.php](http://www.ncsu.edu/policies/campus_environ/health_safety_welfare/REG04.20.7.php)

CREDIT ONLY/AUDIT

Students taking the course for credit only (S/U) must take all examinations, complete the homework assignments, and score a total of at least 695 points (69.5%) to receive an "S".

STUDENTS WITH DISABILITIES

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 515-7653. Additional information on NC State's policy on working with students with disabilities is located on the NCSU website: [http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.1.php](http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.1.php)