



Course: ENPM627 – Environmental Risk Analysis
Semester: Spring 2023
Day(s): Monday
Time: 7:00-9:40 pm
Location: TBA; Online
Instructor: Dr. Christianne Ridge and Dr. Karen Pinkston
Office Hours: Thursdays 6-7 PM (Pinkston), Saturdays 3-4 PM (Ridge), or by appointment
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Course Description

This course covers fundamental aspects of environmental risk analysis and methods used to perform environmental risk analyses. It is designed to help professionals who may need to determine the need for and scope of environmental risk analyses, manage a team of subject matter experts to develop environmental risk analyses, or evaluate completed analyses. It covers fundamental aspects of designing a risk analysis as well as a sufficient understanding of each step of the process to manage a team or conduct a review. It also covers common pitfalls to avoid and major sources of uncertainty in environmental risk analyses.

Topics covered in the class include: establishing the scope of an analysis, developing alternative conceptual models, representing source term release, modeling contaminant transport in environmental media (e.g., surface water, groundwater, air), modeling food chains, conducting an exposure assessment, understanding basic human toxicology, characterizing the dose-response relationship, and effectively communicating about and managing risk. The course will have a strong emphasis on the context for the development and use of environmental risk analyses and the importance of considering uncertainty in each step of a risk analysis.

After completing this course, the student should be able to perform an analysis of the potential human health risks from an operating facility or legacy contamination, including determining what scenarios to analyze (i.e., who is likely to receive the highest risk from the site and how are they likely to be exposed) as well as a quantitative evaluation of the source term release, the transport of the contaminant in the environment, the projected exposure of a hypothetical individual to the contaminant, and a calculation of the projected risk resulting from the exposure.

Grading Procedures:
Homework 35%
Midterm 30%
Final 35%

Textbooks

Both textbooks can be read online free of charge with your university login at <https://ebookcentral.proquest.com/lib/umdcpl/>

Quantitative Environmental Risk Analysis for Human Health. Robert A. Fjeld, Norman A. Eisenberg, Keith L. Compton. John Wiley & Sons, 2007 ISBN: 978-0-471-72243-4,

Environmental Risk Assessment: A Toxicological Approach 1st Edition. Ted Simon. CRC Press, 2014. ISBN: 978-1138033832

- Required? Yes



Course Outline

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|-----------|---|
| 1/30/2023 | Introduction to Environmental Risk Analysis |
| 2/06/2023 | Introduction to Uncertainty in Environmental Risk Analysis |
| 2/13/2023 | Source Term and Release Assessment |
| 2/20/2023 | Fundamental Aspects of Transport Modeling |
| 2/27/2023 | Surface Water Transport |
| 3/06/2023 | Groundwater Transport |
| 3/13/2023 | Atmospheric Transport |
| 3/20/2023 | Spring Break – No Lecture |
| 3/27/2023 | Online Midterm - No Lecture (take midterm between March 27th and April 2nd) |
| 4/03/2023 | Food Chain Transport and Basic Human Toxicology |
| 4/10/2023 | Exposure Assessment |
| 4/17/2023 | Dose-Response and Risk Characterization |
| 4/24/2023 | Screening Analysis |
| 5/01/2023 | Risk Communication |
| 5/08/2023 | Risk Management and Interpreting Probabilistic Results |
| | Online Final Exam (take final between May 9th and May 17th) |

Code of Academic Integrity

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity of the Student Honor Council, please visit <http://shc.umd.edu/SHC/HonorPledgeInformation.aspx>.