RADIOLOGICAL HAZARD MANAGEMENT
E400/H455
Spring 2017

School of Public and Environmental Affairs
Indiana University

INSTRUCTOR:	Greg Crouch, MPH, MS	**OFFICE:**	Jordan Hall 071
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PURPOSE

The purpose of this course is to provide students with the broad understanding needed by environmental and public health administrators for effective management of the complex radiological hazards present in modern technological society. The first portion of the course consists of a review of the historical development of various nuclear and radiation-producing technologies, the emergence of concerns over the hazards associated with these technologies, biological effects and risks of radiation, principles of radiological safety practice, and current regulatory structure for managing radiological hazards. The introductory review provided during the first portion of the course serves as a framework for discussion of a variety of topical issues in the second portion of the course.

OBJECTIVES

At the conclusion of this course, the student will be able to:

1. Explain the fundamental concepts of radioactivity, ionizing radiation, biological effects of radiation, and radiological safety practice.

2. Discuss the current regulatory structure for controlling radiological hazards in the United States.

3. Describe the types and uses of various radiation-producing and nuclear technologies.

4. Determine the appropriate regulatory controls and radiological safety practices for specific uses of radiation-producing and nuclear technologies.

5. Evaluate and communicate the relative risks of radiation-producing and nuclear technologies compared to other technological risks.

WEB RESOURCES

http://www.radiationanswers.org/

http://www.epa.gov/radtown/

http://www.nrc.gov/about-nrc/radiation.html

http://training.fema.gov/EMIWeb/IS/is301lst.asp

http://www.nrc.gov/

http://www.hps.org/

GRADING POLICY

The final grade will be based upon a total of 500 points as follows:

1. **Examinations** (300 points total) - Three examinations (100 points each) will be given during the course of the semester. The examinations will cover material presented in class (including student presentations) and supported from assigned readings and class discussions. The examinations will not be cumulative; however, an understanding of material covered previously in the course will be helpful in answering subsequent examination questions.

2. **Individual Presentation** (100 points) - Each student is required to research, prepare, and deliver a presentation on a specific issue regarding nuclear technology, its health or environmental consequences, and associated radiological safety and regulatory controls. No later than 24 hours before the presentation, the student must post (at the class CANVAS site) a final outline of the presentation (2-3 pages in length) and a reference page (at least 6 references must be included). Individual presentations are expected to require 20 minutes. The use of visual supporting materials such as slides and handouts is strongly encouraged (total time of video clips should not exceed 5 minutes). The presentation will be evaluated for its applicability, organization, content, delivery, and general effectiveness.

3. **Evaluation of Presentations** (60 points) – Each student is required to serve as an evaluator for three Student Presentations. The grade is based upon the quality of comments written in support of the assigned rating in each of five categories (4 points per category for a total of 20 points per evaluation).

4. **News Media Presentation** (20 points) – Each student is required to present a short (< 5 minute) news video clip on a relevant topic and briefly discuss the strengths and weaknesses of the coverage.

5. **Class Participation** (20 points)

Grading Scale:	90-100	A	(+ awarded to top 3 points of each scale;
	80-89	B	- awarded to bottom 3 points of each scale)
	70-79	C	
	60-69	D	
	< 60	F	

E400/H455 "PRELIMINARY" SCHEDULE

DATE	TOPIC
1/10	Introduction to the Course
1/12	Historical Perspectives
1/17	Radioactivity and Ionizing Radiation
1/19	Radiation Quantities and Measurement
1/24	Biological Effects of Radiation
1/26	Radiation Sources, Risks, and Limits
1/31	Radiological Safety Practice
2/2	Regulatory Controls
2/7	**Exam 1**
2/9	Nuclear Energy
2/14	Nuclear Reactors
2/23	Reactor Safety
2/28	Reactor Accidents
3/2	Reactor Accidents
3/7	High-level Radioactive Waste
3/9	Low-level Radioactive Waste
3/21	Decommissioning/Transportation Issues
3/23	**Exam 2**
3/28	Nuclear Weapons Development/Testing
3/30	Nuclear Weapons Use
4/4	Nuclear Terrorism
4/6	Radiological Accidents/Emergency Response

4/11	X-ray Machines/Particle Accelerators
4/13	Radiation Therapy
4/18	Medical Diagnosis
4/20	Food and Product Irradiation/Industrial Radiation Uses
4/25	Natural and Space Radiation Hazards
4/27	Course Review
5/4	**Exam 3** (10:15 a.m. – 12:15 p.m.)

STUDENT MISCONDUCT

Academic and personal misconduct by students in this class are defined and dealt with according to the procedures in the *Code of Student Ethics* http://studentcode.iu.edu/