SYLLABUS: PUBHEHS 6305/6310
PRINCIPLES OF ENVIRONMENTAL HEALTH SCIENCE (PEHP)
SPRING 2016

Course overview

Instructor
Instructor: Darryl B. Hood, Ph.D., Associate Professor
Email address: hood.188@osu.edu
Phone number: 615-247-4941
Office hours: by appointment only
Office location: 408 Cunz Hall

Teaching Assistant (MPH)
TA: Tyler J. Gorham, Doctoral Student and he can be reached:

- 4th floor, Cunz Hall
- Email: gorham.20@buckeyemail.osu.edu
- Office Hours – Tuesday 9:30 am – 11:30 am.

TA responsibilities The TA assigned to the course will hold regular office hours for any students who need help with class material. The TA may assist with scoring homework and exams; however, final grade assignment will be the responsibility of the course coordinator. Any questions regarding grading should be directed to the professor and not the TA.
Course description

Environmental health is one of the five major core areas of public health practice along with health services management and economics, epidemiology, biostatistics, and health behavior/health promotion. Environmental health has been defined by the World Health Organization, 2004 as “those aspects of human health, including quality of life, that are determined by physical, chemical, biological, social, and psychosocial factors in the environment.” Environmental health has a major impact on public health. Globally, it is estimated that 24% of the disease burden and 23% of premature mortality is attributable to environmental factors. In this course, we will consider environmental health sciences as a cornerstone to public health. The course will focus on chemical, physical, and biological agents in the environment that influence human health. For those students who elect to specialize in environmental health, this course provides a stepping-stone for the more specialized, in-depth courses such as Epidemiology, Microbiology, Toxicology, Exposure Science Monitoring, Risk Assessment, among others. For those students who plan to specialize in other areas of public health, this course will help to place environmental issues within the larger context of public health practice.

Course Format

Class Format: This is a hybrid course. Saturday sessions are held from 9:00 am to 4pm.

In-Person Class Time and Location: There are four in-person sessions in this course. You are required to attend all four sessions. The meeting dates and times are:

<table>
<thead>
<tr>
<th>DATE</th>
<th>SESSION TOPICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1-Saturday</td>
<td></td>
</tr>
<tr>
<td>January 23, 2016</td>
<td>I. Introduction</td>
</tr>
<tr>
<td>9:00am to 4pm</td>
<td>II. Sources of Environmental Concern</td>
</tr>
<tr>
<td></td>
<td>III. Environmental Agents</td>
</tr>
<tr>
<td>Session 2-Saturday</td>
<td></td>
</tr>
<tr>
<td>February 20, 2016</td>
<td></td>
</tr>
<tr>
<td>9:00am to 4pm</td>
<td>III. Environmental Agents (continued)</td>
</tr>
<tr>
<td></td>
<td>IV. Environmental Matrices</td>
</tr>
<tr>
<td>Session 3-Saturday</td>
<td></td>
</tr>
<tr>
<td>March 26, 2016</td>
<td></td>
</tr>
<tr>
<td>9:00am to 4pm</td>
<td>V. Tools for Human Environmental Evaluations (Comprehensive, but limited)</td>
</tr>
<tr>
<td>Session 4- Saturday</td>
<td></td>
</tr>
<tr>
<td>April 23, 2016</td>
<td></td>
</tr>
<tr>
<td>9:00am to 4pm</td>
<td>V. Tools for Human Environmental Evaluations (continued)</td>
</tr>
<tr>
<td></td>
<td>VI. Special Topics</td>
</tr>
</tbody>
</table>

Saturday sessions will be divided into seven segments separated by a 5-minute break. The first 40 minutes or so of each session will be used for lecture to present relevant principles and concepts. The lecture will introduce, reinforce, and complement the required reading relating to the topic. The next 10-minutes will be used for Frequent Low Stakes Assessment to be comprised of students providing immediate feedback on the subject matter that was presented.
in the first 40-min of the session. This will take the form of providing answers to 3-5 questions. We will use either Top Hat or Carmen portals. The final 5-minutes of each session will be used for a break. You will be given approximately 40-minutes for a lunch break between 12noon and 12:40pm. At times, you will be divided into assigned small groups to discuss subject matter and/or case studies. The relative time allotted to each activity may vary depending on need. Groups have been assigned randomly in Carmen. Please see the content page in Carmen for your group assignment and review the Small Group Activity sub-section below as well as the document “Guidelines and Rubric for Small Group Activity.”

**Online Course Content:** In addition to turning in your work, you will also use Carmen to complete any group work or discussions, access required readings and viewings for this course as well as to stay informed of course updates and assignment due dates.

**Core Competencies in EHS for all MPH students and Learning Objectives**

Upon completion of the MPH degree, all graduates will be prepared to:

- Apply foundational principles of environmental health science to categorize sources and types of contaminants, matrices involved, pathways and modes of exposure, associated health effects and societal issues, approaches to control, and major regulations.
- Demonstrate effective written and oral skills for communicating with different audiences in the context of professional public health activities
- Develop public health programs and strategies responsive to the diverse cultural values and traditions of the communities being served
- Apply basic principles of ethical analysis to issues of public health practice and policy; and, collaborate with multidisciplinary groups to recognize and evaluate public health issues and develop strategies for intervention

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

- Discuss the significance of the environment to population-based health
- Define and distinguish various environmental agents (i.e., chemical, physical, and biological) and environmental classifications (i.e. natural, anthropogenic, social, and cultural) that influence public health
- Describe the various environmental media and the chemical and physical factors that influence contaminant partitioning, fate, and transport within and between environmental media as relevant to human exposure
- Specify approaches for assessing and controlling environmental agents and strategies for reducing risks to human health
- Explain environmental justice and the significance as a public health issue
Course materials

Required

Additional readings, chapters, articles, and web-based will be provided in pdf file format or easily accessible via the internet. Required supplemental materials
All required reading material is available via links in your Carmen course

Course technology
For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at https://ocio.osu.edu/help/hours, and support for urgent issues is available 24x7.

- Self-Service and Chat support: http://ocio.osu.edu/selfservice
- Phone: 614-688-HELP (4357)
- Email: 8help@osu.edu
- TDD: 614-688-8743

Baseline technical skills necessary for online courses
- Basic computer and web-browsing skills
- Navigating Carmen

Necessary equipment
- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
Grading and Assignments

Grades
Students will be evaluated based on five class activities:

<table>
<thead>
<tr>
<th>ASSIGNMENT OR CATEGORY</th>
<th>% OF GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARMEN DISCUSSION (IN ASSIGNED GROUP)</td>
<td>5 %</td>
</tr>
<tr>
<td>Small Group Activities</td>
<td></td>
</tr>
<tr>
<td>Discussions</td>
<td>5 %</td>
</tr>
<tr>
<td>Reports and Power Point Presentations</td>
<td>10 %</td>
</tr>
<tr>
<td>Exam #1</td>
<td>15 %</td>
</tr>
<tr>
<td>Exam #2</td>
<td>25 %</td>
</tr>
<tr>
<td>Exam #3 (FINAL EXAM)</td>
<td>25 %</td>
</tr>
<tr>
<td>Frequent Low-Stakes Assessments</td>
<td>10%</td>
</tr>
</tbody>
</table>

See course schedule, below, for due dates.

Assignments and Activities
(see document “Guidelines and Rubric for Small Group Activity”)

Small Group Activities: Environmental health problems are often multidisciplinary in nature, requiring collaboration to achieve effective solutions. To provide experience with such collaborations, the course will be structured so that students will have the opportunity to work across specializations. The small group activities will be centered around three topics. In the order they will be covered, they are:

I. Historical Figure
II. Environmental Health Exposure Disaster
III. Special Topics – Environmental Health Sources

Groups will be randomly assigned by Carmen. You will be working only with the members of your assigned group for all three topics. You will not be able to see the work of individuals in others groups. You will work in your groups to complete the following:
Discussions – During the course of the semester, each student will be required to compose and submit original discussion entries as well as responded to discussion entries provided by fellow students. Details on this activity can be found “Small Group Activity Guidelines and Rubric.” All work will be turned in via Carmen.

Reports – Each group will be required to turn in a one-page report at the end of class. Each member of the group must “sign off” and approve the document before it’s submitted.

Presentations - Groups will present their project at the end of the semester and post their PowerPoint slides to Carmen (specific details will be available by the end of February). General aspects of presentations will be covered on the final exam. Students will be required to develop and submit two-multiple choice exam questions related to their project.

Exams: There will be three exams. The format of exams will be multiple choice, matching, and short answer. All exams will be given in Carmen. Detailed instructions can be found in the corresponding Sessions folders in Carmen. Exams will cover the following Session topics:

- **Exam 1:** I. Introduction; II. Sources of Environmental Concern and III. Environmental Agents.
- **Exam 2:** IV. Environmental Matrices; V. Tools for Human Environmental Evaluations. (Comprehensive, but limited)
- **Exam 3:** VI. Special Topics (Comprehensive, but limited, plus a few questions on group presentations)

Frequent Low-Stakes Assessments: Part of your in-person Saturday sessions will include "frequent low-stakes assessments" - these can take the form of quizzes, discussions, group activities or any assessment format that promotes inquiry, active student learning and increases motivation.

For the month of January the frequent low-stakes assessment will occur in Carmen or Top Hat. The activity will open at 9am on Saturday, January 23rd and close on Sunday at 9am on January 24th.

Information and the location of the frequent low-stakes assessments for the months of February, March and April will be posted in the Updates section of this course.

Late assignments

No late assignments will be accepted.
Grading scale

<table>
<thead>
<tr>
<th>GRADE</th>
<th>PERCENTAGE</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100-93</td>
<td>Outstanding performance; consistently shown exceptional depth of understanding and/or capacity for creative application of course concepts.</td>
</tr>
<tr>
<td>A-</td>
<td>92.9-90</td>
<td>Very strong performance with demonstrated depth of understanding and/or ability to apply course concepts</td>
</tr>
<tr>
<td>B+</td>
<td>89.9-87</td>
<td>Performance at an expected level; work is complete and shows solid understanding and application of course concepts</td>
</tr>
<tr>
<td>B</td>
<td>86.9-83</td>
<td>Adequate performance; work is complete but shows some limitations in grasp or ability to apply course concepts</td>
</tr>
<tr>
<td>B-</td>
<td>82.9-80</td>
<td>Marginally acceptable; work is conducted only to meet minimum course requirements; student lacks or has limited understanding of key concepts and issues</td>
</tr>
<tr>
<td>C+</td>
<td>79.9-77</td>
<td>Grades below B- indicate significant problems in understanding or applying course concepts and/or failure to meet stated course requirements.</td>
</tr>
<tr>
<td>C</td>
<td>76.9-73</td>
<td></td>
</tr>
<tr>
<td>C-</td>
<td>72.9-70</td>
<td></td>
</tr>
<tr>
<td>D+</td>
<td>69.9-67</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>66.9-60</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>&lt;60</td>
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</tbody>
</table>

Faculty feedback and response time

I am providing the following list to give you an idea of my intended availability throughout the course. (Remember that you can call 614-688-HELP at any time if you have a technical problem.)

Grading and feedback
For large weekly assignments, you can generally expect feedback within 7 days.

E-mail
I will reply to e-mails within 24 hours on school days. I will reply by email only. Please do not call.
Discussion board
I will check and reply to messages in the discussion boards every 24 hours on school days.

Attendance, participation, and discussions

Student participation requirements
Because this is a hybrid course, your attendance is based on your online activity and participation. The following is a summary of everyone's expected participation:

- **Logging in: AT LEAST TWICE PER WEEK**
  Be sure you are logging in to the course in Carmen each week, including weeks with holidays or weeks with minimal online course activity. (During most weeks, you will probably log in many times.) If you have a situation that might cause you to miss an entire week of class, discuss it with me as soon as possible.

- **Participating in discussion forums: 3+ TIMES PER WEEK**
  As participation, each week you can expect to post at least four times as part of our substantive class discussion on the week's topics.

Discussion and communication guidelines
The following are my expectations of how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style:** While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. Informality (including an occasional emoticon) is fine for non-academic topics.

- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online.

- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. (For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.)

- **Backing up your work:** Carmen does NOT save your work as you go along for most activities (other than exams and quizzes) so I strongly suggest composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.
Other course policies

Academic integrity policy

Policies for this online course

- **Quizzes and exams**: You must complete the midterm and final exams yourself, without any external help or communication. Weekly quizzes are included as self-checks without points attached.

- **Written assignments**: Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should follow APA style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in—no one else should revise or rewrite your work.

- **Reusing past work**: In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.

- **Falsifying research or results**: All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.

- **Collaboration and informal peer-review**: The course requires small group collaboration. While group and peer-review of major written projects is required, remember that comparing answers on exams is not permitted. If you're unsure about a particular situation, please feel free to ask ahead of time.

- **Group projects**: This course includes group projects, which can be stressful for students when it comes to dividing work, taking credit, and receiving grades and feedback. I have attempted to provide clear guidelines for group work as clear as possible (see Guidelines and Rubric for Small Group Activity) for each activity and assignment, but please let me know if you have any questions.

Ohio State’s academic integrity policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University’s Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University’s Code of Student Conduct and this syllabus may constitute “Academic Misconduct.”

The Ohio State University’s Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: “Any activity that tends to compromise the academic integrity of the University,
or subvert the educational process.” Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University’s Code of Student Conduct is never considered an “excuse” for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University’s Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages (COAM Home)
- Ten Suggestions for Preserving Academic Integrity (Ten Suggestions)
- Eight Cardinal Rules of Academic Integrity (www.northwestern.edu/uacc/8cards.htm)

Accessibility accommodations for students with disabilities

Requesting accommodations

If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential.

In addition to contacting the instructor, please contact the Student Life Disability Services at 614-292-3307 or ods@osu.edu to register for services and/or to coordinate any accommodations you may need in your courses at The Ohio State University.

Go to http://ods.osu.edu for more information.

Accessibility of course technology

This online course requires use of Carmen (Ohio State’s learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- Carmen (Desire2Learn) accessibility
- Streaming audio and video
- Synchronous course tools
# Course schedule (tentative)

*You are responsible for completing all of the readings/viewings BEFORE the live class sessions*

## SESSION #1

### January 23, 2016

### TOPICS:
1. Introduction
2. Sources of Environmental Concern
3. Environmental Agents

<table>
<thead>
<tr>
<th>Session segment topic and number</th>
<th>Reading Material</th>
<th>Reading/Viewing (all links in Carmen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Course Overview; Global Burden of Disease and Role of the Environment (Hood)</td>
<td>Required Reading: Frumkin Chapter 1; pages 3-47</td>
<td>• WEBNOTE: “Study finds year living with disease, injury increasing globally”, from Harvard School of Public Health Introduction and Methods: Assessing the environmental burden of disease at national and local levels</td>
</tr>
<tr>
<td>2 Introduction to Environmental Health Sciences (EHS) and the EHS model (Hood)</td>
<td>Frumkin Chapter 3; Pages 3-47</td>
<td>• VIDEO: Highlights from the Global Burden of Disease 2010 Study: <a href="http://www.atsdr.cdc.gov/HAC/pha.html">http://www.atsdr.cdc.gov/HAC/pha.html</a></td>
</tr>
</tbody>
</table>

### II. Sources of Environmental Concern

<table>
<thead>
<tr>
<th>Session segment topic and number</th>
<th>Reading Material</th>
<th>Reading/Viewing (all links in Carmen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Population Growth; Urbanization (Hood)</td>
<td>Frumkin Chapter 5</td>
<td>• VIDEO: Rapid Urbanization and Impacts on Food Systems • VIDEO: The Effects of Urbanization and Infrastructure Development on the Environment</td>
</tr>
<tr>
<td>4 Built Environment (Hood)</td>
<td>Frumkin Chapter 14</td>
<td>• VIDEO: Built Environment Policies and Practices for Health</td>
</tr>
<tr>
<td>5 Energy (Hood)</td>
<td>Frumkin Chapter 13</td>
<td>• NARRATED PRESENTATION: Peak Oil and Global Sustainability Presentations (All four parts): o The great convergence o Cheap Energy o Energy demand through o Global solutions to the oil dilemma</td>
</tr>
</tbody>
</table>

### III. Environmental Agents

<table>
<thead>
<tr>
<th>Session segment topic and number</th>
<th>Reading Material</th>
<th>Reading/Viewing (all links in Carmen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 Biological Agents 1 (Hood)</td>
<td>Assignment Reading to be made available at Carmen</td>
<td>• INTERACTIVE IMAGE: Scale of the Universe • VIDEO: Ted talk: Infectious Disease Hunter • VIDEO: Contagion: From Simple Cough to Global Pandemic</td>
</tr>
</tbody>
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**EXAM I**

will be open from January 27th 12:01am to February 3rd at 11:59pm
You are responsible for completing all of the readings/viewings BEFORE the live class sessions

**SESSION #2**  
**February 20, 2016**

**TOPICS:**
- III. Environmental Agents (continued)
- IV - Environmental Matrices

### III. Environmental Agents (continued)

<table>
<thead>
<tr>
<th>Session segment topic and number</th>
<th>Reading Material</th>
<th>Reading/Viewing (all links in Carmen)</th>
</tr>
</thead>
</table>
| 7 Chemical Agents including Pesticides (Hood) | Frumkin, Chapter 17 | - EPA - Environmental Affects of Pesticides  
- Short video "Little things Matter-The impact of toxins on the developing brain" [https://www.youtube.com/watch?v=E6KoMAbZ1Bw](https://www.youtube.com/watch?v=E6KoMAbZ1Bw) |

### IV Environmental Matrices

<table>
<thead>
<tr>
<th>Session segment topic and number</th>
<th>Reading Material</th>
<th>Reading/Viewing (all links in Carmen)</th>
</tr>
</thead>
</table>
| 8 Air Pollution/Climate Change (Sun) | Frumkin Chapter 12 | - VIDEO: EPA-funded Research Examines Air Pollution's Effect on Public Health  
- VIDEO: Watch Common Air Pollutants and their Sources  
- VIDEO: The Devastating Effects of Pollution in China Part 1 |
| 9 Water (Lee) | Frumkin Chapter 13 | - VIDEO: Municipal/Large-Scale Wastewater Treatment  
- VIDEO: On-Site/Small-Scale Wastewater Treatment  
- VIDEO: Potable Water Treatment |
| 10 Microbiology Primer (web-based module in Carmen) | Frumkin Chapter 18 | - Microbiology Primer Tutorial video and accompanying PPT |
| 11 Overview of Risk Assessment (Adetona) | Frumkin Chapter 29 | - VIDEO: Intro to Risk Assessment: |
| 12 Policy Making/Regulations (Berman) | Frumkin Chapters 30 and 32 | - VIDEO: Developing and Influencing Policy for Public Health |

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**EXAM II**  
will be open from February 24th 12:01am to March 2nd at 11:59pm
**You are responsible for completing all of the readings/viewings BEFORE the live class sessions**

**SESSION #3**

**March 26, 2016**

**TOPICS:**

V. Tools for Human Environmental Evaluations

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**V. Tools for Human Environmental Evaluations**

<table>
<thead>
<tr>
<th>Session segment topic and number</th>
<th>Reading Material</th>
<th>Reading/Viewing (all links in Carmen)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>14</strong> Disaster Planning and Preparedness <em>(Bisesi)</em></td>
<td>Frumkin Chapter 2</td>
<td>• Introduction to the Incident Command System <a href="http://training.fema.gov/is/courseoverview.aspx?code=IS-100.b">http://training.fema.gov/is/courseoverview.aspx?code=IS-100.b</a></td>
</tr>
</tbody>
</table>
| **15** Principles of Toxicology *(Hood)* | Frumkin Chapter 12 | • Toxicology Tutorial: [http://toxlearn.nlm.nih.gov/indexv.html](http://toxlearn.nlm.nih.gov/indexv.html)  
• VIDEO: Absorption, Distribution, Metabolism, and Elimination (ADME) |
| **16** Food *(Jiyoung Lee)* | Frumkin Chapter 18 | |
| **18** Application of knowledge to case studies (group analysis) | See Carmen Site for Case Studies and Questions | Group 1 takes Case Study 1, Chemical Agents  
Group 2 takes Case Study 2, Biological Agents  
Group 3 takes Case Study 3, Infectious Diseases |
You are responsible for completing all of the readings/viewings BEFORE the live class sessions

### Session #4
#### April 23, 2016

<table>
<thead>
<tr>
<th>IV. Tools for Human Environmental Evaluations (continued)</th>
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</thead>
<tbody>
<tr>
<td><strong>Session segment topic and number</strong></td>
</tr>
<tr>
<td>19</td>
</tr>
<tr>
<td>20</td>
</tr>
</tbody>
</table>
2) The Road to Executive Order 12898 on Environmental Justice  
3) U.S. EPA kicks off air quality research in Colorado with NASA and NOAA  
4) Protecting People and the Environment |
| 22  | Physical Agents – Community Noise and Community Radiation (Bisesi) | Frumkin Chapter 21 | • VIDEO: Light and Noise Pollution  
• VIDEO: Ionizing Radiation: “What Is Ionizing Radiation?: P1  
• VIDEO: Ionizing Radiation “Quantities and Units” P5  
• VIDEO: Overview of Radon Mitigation Approaches  
• VIDEO: Testing Your Home for Radon Gas |

<table>
<thead>
<tr>
<th>V. Special Topics</th>
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</table>

**Student Presentations**

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**FINAL EXAM**

will be open from April 27th 12:01am and May 3rd, 2016 at 11:59pm