

**PITTSBURG STATE UNIVERSITY  
COLLEGE OF ARTS AND SCIENCES  
DEPARTMENT OF BIOLOGY  
ENVIRONMENTAL HEALTH [BIOL 617]  
SPRING 2019 SYLLABUS**

**Course Intended for Partial Fulfillment of the Pitt State Pathway Curriculum**

***Instructor and contact information:*** Dr. Anuradha Ghosh  
321 Heckert-Wells (Office)  
Department of Biology  
Pittsburg State University  
E-mail: aghosh@pittstate.edu  
Phone: 620-235-4532  
Hours: 10-12 MWF, 10-11 TTh, 2-3 MW or by appo.

## **PITT STATE PATHWAY**

### ***Mission Statement***

The Pitt State Pathway curriculum serves as the heart of the university education by fostering interdisciplinary competencies that typify the educated person. It is designed to facilitate the development of key proficiencies including communication and information literacy. The Pitt State Pathway curriculum provides a transformational experience that challenges students to think creatively and critically, and to immerse themselves in the productive examination of humans in their global setting. By encouraging the development of skills that promote life-long learning, the Pitt State Pathway fosters a sense of personal responsibility, an appreciation of diversity, and an understanding of interconnectedness in our truly global society.

### ***Pitt State Pathway Pillar to Be Covered in This Course***

#### ***Global Understanding and Civic Engagement***

As global citizens, students need a comprehensive understanding of where they live and of the larger, interconnected global system of which they are part, and on which they depend. While identifying commonalities among people and places is important, it is crucial that students understand and appreciate the diverse cultural, social, political, economic, and environmental contexts that create differences. Understanding the role of responsible citizens in their own community and beyond ensures effective and ethical participation at all levels. Students also need to understand how biological, physical, and chemical systems work, how they change naturally, and how they can change due to human involvement. Understanding the implications of the interaction between humans and non-human systems is essential for long-term decision-making.

*Learning Outcome:* Students will explore global systems conscientiously.

### ***Pitt State Pathway Essential Element to Be Covered in This Course***

#### ***Natural World within a Global Context***

Biological, physical, and chemical systems form the context for life. Students need to understand how

these systems work, how these change naturally, and how these can change as a result of human activities. The implications of these changes are essential for long-term decision-making. Competency in this element means:

- Analyzing biological, physical, and/or chemical systems;
- Evaluating the implications of changes that result from interactions between natural and human systems.

**Description of the Course:** This course provides an introduction and overview of the key areas of environmental health. Using the perspectives of the population and community, the course covers factors associated with the development of environmental health problems. Focus areas are the understanding of the interaction of individuals and communities with the environment, the potential impact of environmental agents on health, and specific applications of concepts of environmental health. The course will cover principles derived from core environmental health disciplines. The sequence of major topics begins with background material and “tools of the trade” (environmental epidemiology, environmental toxicology, and environmental policy and regulation). The course then covers specific agents of environmental diseases (e.g., microbial agents, ionizing and nonionizing radiation). Applications and domains of environmental health are addressed (e.g., water and air quality, food safety, waste disposal, and occupational health). This course also introduces conceptual definitions of sustainability and examine and critique sustainability plans.

**Prerequisites:** BIOL 113 or BIOL 111/112 or BIOL 211/212

### **Course Learning Outcomes:**

**Essential Studies Element: Natural World within a Global Context: Level of Student Learning: Milestone I**

- Definition of Milestone I under Natural World within a Global Context: *Students will explain biological, physical and/or chemical processes and human activities that alter them*

Students who complete this course will be able to:

1. Discuss the history and definition of environmental health.
2. **Analyze the association between population growth and dissemination of environmental pollutants.**
3. Describe methods used in epidemiology and toxicology and **apply** the knowledge to assess environmental exposures and hazards.
4. Describe policies that have been developed to manage health risks associated with exposures to environmental hazards.
5. Describe chemical, physical, and microbial agents that originate in the environment and **analyze their impact on human health.**
6. **Explains** specific applications of environmental health concepts to fields such as water quality control, food safety, and occupational health.
7. **Demonstrate** an understanding of how resources and best practices in management of those resources leads to sustainability.

**Method(s) of Assessment:**

**Assignments:** Up to 5 writing assignments, one outreach activity, create a digital story-telling video

**Natural World within a Global Context:** To assess the chosen level of student learning (Milestone I), the writing assignments, outreach activity, and digital story-telling will be to explain biological, physical and/or chemical processes and how human activities alter them.

**Other assessments include** four in-class unit exams, weekly online quizzes, in-class and/or online presentation, participation on discussion forum and in-class debates.

**Required textbook:**

Friis, Robert H. 2019. *Essentials of Environmental Health*. 3<sup>rd</sup> Edition. Jones and Bartlett Learning (Publisher), Burlington, Massachusetts [ISBN-13: 9781284123975; ISBN-10: 1284123979]

Additional content is accessed on CANVAS as pdf files or as links to internet sources.

**Course Outline/Content:**

This is a **hybrid** 3 credit hour course; the course materials will be available on CANVAS. Class meets **every week face-to-face MW 1-1.50pm at Heckert Wells 319**. We follow the University calendar for Spring 2019. The following serves as a tentative outline, and may change slightly pending student interest in specific topics. All course communications must be from within the CANVAS message system.

Week	Date	Topic*	
1	M Jan 14 W Jan 16	Introduction: the Environment at Risk	Chapter 1 Online Quiz 1
2	W Jan 23	Environmental Epidemiology	Chapter 2  Online Quiz 2
3	M Jan 28 W Jan 30	Environmental Toxicology	Chapter 3  Online Quiz 3
4	M Feb 04 W Feb 06	Guest Lecture Environmental Policy & Regulation	Chapter 4 Online Quiz 4
5	M Feb 11 W Feb 13	Zoonotic & Vector-borne Diseases	In-class Exam 1 Chapter 5
6	M Feb 18 W Feb 20	Toxic Metals & Elements	Chapter 6  Online Quiz 5
7	M Feb 25 W Feb 27	Pesticides & Other Organic Chemicals	Chapter 7  Online Quiz 6
8	M Mar 04 W Mar 06	Guest Lecture Ionizing & Nonionizing Radiation	Chapter 8  Online Quiz 7
9	M Mar 11 W Mar 13	Spring Break	
10	M Mar 18 W Mar 20	Water Quality	In-class Exam 2 Chapter 9
11	M Mar 25 W Mar 27	Air Quality  Visit Water Treatment Facility	Chapter 10  Online Quiz 8
12	M Apr 01 W Apr 03	Food Safety Oral presentation	Chapter 11  Online Quiz 9
13	M Apr 08 W Apr 10	Oral presentation Guest Lecture	
14	M Apr 15 W Apr 17	Solid & Liquid Waste Visit Wastewater Treatment Facility	In-class Exam 3 Chapter 12
15	M Apr 22 W Apr 24	Occupational Health	Chapter 13  Online Quiz 10
16	M Apr 29 W May 01	Guest Lecture Unintentional Injuries & Deaths	Chapter 14  Online Quiz 11
17	May 6-10	FINAL S WEEK	In-class Exam 4

\*Few topics will be covered by online lectures.

### Etiquette Expectations (Netiquette):

- Cell phones are not to be out during lecture or quizzes, except with instructor's permission. Phones should be on silent/vibration upon entering the classroom. Laptops are allowed for note-taking unless they become distracting.
- It is expected that all students will communicate with one another and the professor in proper tone and civility, whether the communication is by electronic means, by phone, or face-to-face.
- E-mails are to be written in standard speaking style and not in popular abbreviations used online and/or using regional colloquialisms.
- Proper spelling and grammar are expected in communications with other students and the professor.
- Please be aware of and sensitive to all cultural differences of students and the professor when communicating.

### Course and University Policies:

**Academic Accommodations:** Please see Center for Student Accommodations (CSA) if you are in need of any accommodations. <http://www.pittstate.edu/office/center-for-student-accommodations/>

CSA is responsible for ensuring that currently enrolled students with documented learning and physical disabilities are provided the tools, appropriate accommodations, and support from the University to fully participate in all aspects of campus life. Please click the link to the “**Syllabus Supplement**” for Fall 2018 semester for more detailed information.

<https://www.pittstate.edu/registrar/syllabus-supplement.html>

**Dead Week Policy:** As stated in the **Syllabus Supplement** regarding Dead Week Policy:

([https://www.pittstate.edu/registrar/\\_files/documents/syllabus-supplement-spring-2019-updated-10-5-18-.pdf](https://www.pittstate.edu/registrar/_files/documents/syllabus-supplement-spring-2019-updated-10-5-18-.pdf)) "no tests or major assignments will be presented during the week prior to final examination week, *unless identified in the course syllabus presented at the start of the semester.*" ***For this class, the final exam will be presented during the finals week as stated in the tentative class schedule.***

In addition, for this class, final points, the syllabus, assignments, due dates, exams, and/or quizzes may be changed accordingly throughout the semester as deemed necessary by the professor.

**Attendance Policy:** Class attendance correlates strongly with success in the course. The instructor may drop a student because of unannounced excessive absence. If you are absent due to illness, notify me via e-mail and provide a doctor’s note.

**Academic Integrity Policy:** Zero tolerance on cheating on exams and quizzes. No tolerance to plagiarism in writing assignments.

<http://www.pittstate.edu/audiences/current-students/policies/rights-and-responsibilities/academic-misconduct.dot> This is the URL for more information on PSU policies concerning academic honesty and integrity.

**Students are encouraged to use [Axe Library](#)** (provides a variety of services related to information retrieval, research, and writing center)

**Other information:** Additional Information about courses, calendars, scheduling, etc. can be found at “**Syllabus Supplement**” for Spring 2019 semester: [https://www.pittstate.edu/registrar/\\_files/documents/syllabus-supplement-spring-2019-updated-10-5-18-.pdf](https://www.pittstate.edu/registrar/_files/documents/syllabus-supplement-spring-2019-updated-10-5-18-.pdf)

**Grading Policy:**

1. Four **in-class unit exams** (one make-up unit exam is allowed). Each exam is worth **100 points**. See tentative class schedule for exam dates. There is no traditional mid-term or comprehensive final exam.
2. **Writing assignments and outreach activities** will make up to **50 points**.
3. Weekly **online quizzes** (multiple-choice) account for total up to **100 points**. One lowest quiz score will be dropped. Online quizzes will be posted on Fridays each week (except the week of unit exams).
4. **In-class and/or online presentation, digital story-telling, and participation on discussion forum and in-class debates** will be worth **50 points**.

Total possible points one could earn is **600 points**. The final course grade is based on total points accrued throughout the semester on each aspect. The CANVAS grade book keeps track of all of this.

**Late submission policy:** I do accept late assignments with this formula – within 24 hours lose 10%, within 24-48 hours lose 20%, nothing after that. Quizzes cannot be made up – they have to be taken within the time allowed.

*There are two field visits (water treatment plant and wastewater treatment plant). The dates will be disclosed later in the semester based on everyone's availability. Field visits are NOT mandatory.*

*Attendance to the Guest Lectures is mandatory. See tentative class schedule for these dates. You may lose points for absence.*

**Grading Scale:** A = 100-90%, B = 89-80%, C = 79-70%, D = 69-60 %, F = 59% and below

**Minimum Technology Requirements:**

- Gorilla Geeks is a great resource for technical issues with Canvas, log ins, etc. They can be reached at the following: Gorilla Geeks Help Desk: 1.620.235.4600, E-mail: [geeks@pittstate.edu](mailto:geeks@pittstate.edu), Web site: <https://www.pittstate.edu/it/gorilla-geeks.html>
- Most of you are new to the Learning Management System (LMS) of Canvas. If you are not completely comfortable with Canvas please click the link to a Canvas help page: <https://www.pittstate.edu/it/information-technology-services/canvas.html>
- If you have technical questions, you can message the professor, use the Help menu the Canvas menu to the left, and/or contact Gorilla Geeks (see above for contact information).

*Example assignments:*

**1. Read the Healthy People Goals for 2020 (hyperlinked in lecture handout)**

<https://www.healthypeople.gov/2020/topics-objectives/topic/environmental-health/objectives>

- Increase use of alternative modes of transportation for work
- Increase the proportion of days that beaches are open and safe for swimming
- Reduce blood lead levels in children
- Increase recycling of municipal solid waste
- Reduce indoor allergen levels
- Reduce exposure to selected environmental chemicals in the population, as measured by blood and urine concentrations of the substances or their metabolites
- Increase the number of States, Territories, Tribes, and the District of Columbia that monitor diseases or conditions that can be caused by exposure to environmental hazards
- Reduce the global burden of disease due to poor water quality, sanitation, and insufficient hygiene

Select **any one** of the above goals and briefly describe how you intend to achieve the goal. (**within 200-300 words**)

**2. Read the two articles [Jarup et al. (2002) and Freeman et al. (2003)] posted on canvas module.**

**Answer the following questions in your own words.**

1. The two articles [Jarup et al. (2002) and Freeman et al. (2003)] have followed two different epidemiological study designs [hint: 6 types of study designs are discussed in the textbook]. Analyze **two** basic differences between these two designs. **(2) (Between 50 - 100 words)**
2. (a) What measuring parameters [hint: RR, OR etc.] were used in these studies and how to evaluate them? **(2)** (b) Discuss the conclusions from both studies based on these parameters. **(4) (Between 150 - 200 words)**
3. Briefly explain **one** limitation for each of the studies and suggest possible ways to take care of the limitation. **(4) (Between 150 - 200 words)**

**3. Read the article Vahter et al. 2007 (posted in week 7 module)**

**Answer the following questions in a word document and upload the file on canvas.**

1. Why do you think that most of the environmental risk assessment data and experimental toxicological studies do not represent women or elderly or children properly? **(2)**
2. Explain how cadmium interferes with hormonal functions in human. **(4)** (Hint. estrogen, androgen)
3. Which metal is the most common cause of hand eczema? **(1)**
4. Mention one research study for each of the following metals: arsenic, mercury and lead - that showed differences in consequences of exposure in males and females (refer to the research articles cited in Vahter et al. 2007). What are those differences? Formulate a table for this answer. **(3)** (Hint. Metal - Reference - male - female)

**4. Assess the impact of potential solutions for California drought.** Balance your assessment with pros and cons of the approaches using appropriate references/source material. You can incorporate weblink of relevant video/audio clips (less than 5 min long). Conclude the discussion by sharing your personal view.

The write up should not be longer than 2 word pages (12 font, Times New Roman, single line space, 1 inch margin all sides).

**OR,**

**Read the following article:**

[Butler EJ 2016 Flint Michigan water crisis.pdf](#)

Discuss your opinion on the reasons behind the crisis. Analyze the regulatory failures associated with this case. In what ways this kind of mishaps could be avoided in future? Discuss your view on how the affected people should be compensated.

The write up should not be longer than 2 word pages (12 font, Times New Roman, single line space, 1 inch margin all sides).

**5. Create a Digital storytelling video on environmental issue.**

**Digital storytelling is one way for students and teachers to share their knowledge.**

- digital stories are brief - usually between 5-10 minutes in length.
- students should take advantage of the variety of media available- music, video, pictures, drawings, text, spoken word, etc.
- students should use the same critical revision skills as they would when editing a paper.

**Please refer to the rubric below before you prepare your story.**

[DigitalStoryRubric for Env Health.pdf](#)

Here are a **list of tools** that you may use to create your story. Make sure you can upload the recorded file through canvas. You can either upload a media recording or external weblink or any other type of file.

[DIGITAL STORYTELLING TOOLS.docx](#)

I encourage you to focus on some environmental issues that you see in your surrounding here at Pittsburg or near your home town (Spring break week could be utilized). You may research on any environmental event in recent past that you deem appropriate to discuss.

The story may cover worrisome situations as well as events/scenario that has positive environmental impact.

We are planning to watch these stories sometime in class after the submission.

Let me know if you have any question.

Below is an example:

[Environmental Issue Digital Story](#)

**6. Writing assignment on ecotoxicology:**

1. Report on Lake Apopka is posted on Week 3 module. Read this report and make a summary of at least 300 words. (8)

2. Mention another example of ecotoxicology study (you need not provide details) and cite the source/reference. (2)

Upload a single word document on canvas for this assignment.

**7. In class debate on Atrazine use in the U.S.**

FARMERS VOICE:

REGULATORS/PEOPLES VOICE:

Everyone need to speak out during this debate. The following articles and video is for your reference.

Feel free to do your own research to count on.

Post your thoughts in this forum also.

<http://readthedirt.org/usa-refuses-to-ban-atrazine>



*USA Refuses to Ban Atrazine*

<http://sustainablepulse.com/2016/06/03/new-epa-risk-assessment-will-lead-to-virtual-us-ban-on-atrazine-herbicide/#.WL3uFvl2ug4>

New EPA Report Will Lead to Virtual US Ban on Atrazine Herbicide

EPA Discounts Science in Latest Atrazine Assessment

**8. Presentation on selected foodborne outbreaks in the U.S.**

- Choose an outbreak that occurred in recent decades (2000-2017)
- Introduce the causal organism
- Analyze the outbreak from both epidemiologist and microbiologist point of view
- Discuss possible preventive measures
- Cite references
- Up to 5 ppt slides
- Submit the ppt on canvas
- Oral presentation between 7-10 min