

**ENVS 320 Envrionmental Toxicology and Impacts on Humans**

**Spring 2018**

**Instructor: Misty Peacock**

**Course website: Canvas webpage**

**Email: mpeacock@nwic.edu**

**Prerequisites:** CHEM 111 or CHEM 121

**Hours:** 9:30-10:45 M,W

**Location:** NES rm 112

**Office Hours**: M 12-2

**Phone:** 360-594-4082

Working textbooks – you do not need to rent/purchase one.

1. Carson, Silent Spring, 2. Greenwood, Leeuw, Lindsay, Reading. Determinants of Indigenous Peoples’ Health in Canada: Beyond the Social, 3. Richards, Bourgeois. Principles and Practice of Toxicology in Public Health, 4. Mercurio. Understanding Toxicology: A Biological Approach.

*Course Overview*

Environmental toxicology is present in everyday life. We live in the world which is largely shaped by chemistry: from the water in the streams, the food we eat, the medicine we practice, to the products we produce. Impacts from environmental toxicants can be seen in all things, and this course will introduce students to both to environmental toxicants and the impacts that they have on humans. We will use place-based topics, such as oil and gas refineries, marine cycling of nutrients, acid rain, and coal production to explore the origins and impacts of environmental toxicology. Environmental toxicology will give a broad overview for topics relevant to environmental science graduates, and can be used as preparation for courses related to natural resource management and technical fields related to synthesis of chemicals.

*Course description*

Focus on place-based environmental toxicology and the impacts of toxicants on the environment and humans within the homelands of Indigenous Peoples of the Pacific Northwest. Topics include environmental toxicology; transport, adsorption, and biotransformation of toxicants in the environment; hazardous air pollutants; and anthropogenic eutrophication.

Each week there will be a lecture class, and a discussion of the week’s reading material, which will be student led.

*Student Evaluation*

*Attendance*

This course relies heavily on student participation in discussion of the reading material. As such, attendance is mandatory and expected and will be reflected in your grade if there is a pattern of missed class.

*Paper and presentation*

Each student will be responsible for paper on a topic of their choice as it pertains to human health and environmental toxicology and present it to the class. **You cannot pass this class if you do not submit a paper and provide a presentation on your paper to the class.** **Your topic will be due in week 3. Your rough draft will be due in week 8 to me or the science writing mentor. You will lose points if you don’t do these two things.**

*Quizzes/Tests*

There will be periodic quizzes and/or tests on the subject material.

*Reading Prompts*

Each student will be responsible for a series of questions related to the weekly reading.

*Discussion Lead*

Each week 2 students will be responsible for leading a group discussion on the readings.

*Student Responsibilities*

Get serious about learning! Students make or break a class. You can help yourself and your peers by making a strong and sustained effort to learn chemistry.

1. Performance. Make an effort to perform at a high level. You are expected to keep pace with the class. If you have difficulty with a part of an assignment or exam, make sure that you ask questions in class or come to office hours. It is important to start a good pace and keep it throughout the quarter. Most students that fall behind in science courses do not pass the class.
2. Attendance. As this course is a seminar course with readings and lectures, attendance is noted and counts toward your overall grade. Participation is necessary. There is no mandatory textbook, the readings are important, as are the discussions that follow them. Please attend class. Attendance is also reported to student services and this information will be used to determine who is eligible to receive financial aid checks, among other things.
3. Community. I encourage students to work together. Working together is a great way to learn, but students MUST turn in their own work. Do NOT copy each other’s work.
4. Participation. Ask questions. If there is a concept or problem that you do not understand, make sure that you ask for an explanation. It is OK to repeatedly ask questions until you understand a problem.
5. If you need to use your cellphone, please step outside class so as not to disturb the rest of us.

**SCHEDULE**

**This is a tentative schedule, expect it to change!!**

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| --- | --- | --- | --- |
| **Week** | **Date** | **Topic** | Readings |
| 1 | 2-Apr | Introduction to Environmental Toxicology | Mercurio, Richards |
|  | 4-Apr | The Wicked Problem | Kreuter et al. |
| 2 | 9-Apr | Concepts of Toxicology | Mercurio, Richards |
| 2 | 11-Apr | Monitoring toxicants in the Environment | **Guest Lecture** |
| 3 | 16-Apr | Bioaccumulation  |  |
| 3 | 18-Apr | Adsorption of Toxicants | **Paper Topics DUE** |
| 4 | 23-Apr | Carcinogens | Richards |
| 4 | 25-Apr | Carcinogens | Richards |
| 5 | 30-Apr | Biotransformation and Elimination of Toxins |  |
| 5 | 2-May | Hazardous Air Pollutants |  |
| 6 | 7-May | Environmental Transport |  |
| 6 | 9-May | Anthropogenic Eutrophication |  |
| 7 | 14-May | Pesticides |  |
| 7 | 16-May | Silent Spring (DDT) | Carson |
| 8 | 21-May | Biotoxins |  |
| 8 | 23-May | Cancer and Genetics | **Guest Lecture – Rough draft paper due to Science Writing Mentor or Instructor** |
|  | **28-May** | **Memorial Day – no class** |  |
| 9 | 28-May | Heavy Metal Toxicology |  |
| 10 | 4-Jun | Forensic Toxicology |  |
| 10 | 6-Jun | Regulating Chemicals in the Environment |  |
| 11 | 11-Jun | Presentations | **PAPER DUE WED 6/13** |

*College mission statement*

“Through education, Northwest Indian College promotes indigenous self-determination and knowledge.”

**BSNES Program outcomes**

Northwest Indian College outcomes related to this course include:

1. Sense of Place

* 1. Value the interrelationships between people and the environment.
	2. Ground and apply concepts and methodologies to place.

We will discuss environmental toxicology as it pertains to the area we live. Specific examples include: mapping of air pollution, introduction to shellfish toxicology, identifying heavy metal toxicant influence, and understanding what industry (i.e., gasoline production) does to the environment.

Note regarding content knowledge: develop literacy in the skills, knowledge and abilities necessary to engage with the surrounding environment*.* An introduction to environmental toxicology will present students with ideas and content that is place-based in the surrounding environment.

4. Communication, a. Communicate using oral, written, and graphical (visual) methods to support Indigenous self-determination.

In ENVS 320, you will develop your ability to communicate by researching and writing a research paper. Students will also be expected to participate in class discussions, and to prepare for this by reading assignments, including primary journal articles.

**NWIC Institutional Outcomes**

As a result of this course, student will work towards:

1. Native Leadership—To Acquire a Quality Education

a. effectively communicate in diverse situations, from receiving to expressing information, both verbally and non-verbally

**NWIC Course Outcomes**

As a result of this course, students will be able to …

1. Demonstrate knowledge of the fundamental principles in environmental toxicology, such as bioaccumulation, biomagnification, and biotransformation of toxicants.
2. Demonstrate knowledge of the relationship between environmental toxicology and humans, including how environmental toxicants impact humans.