

Environmental Health: Science, Policy and Social Justice

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Program core question: “How do we go about learning about risk, prioritizing and responding to it?”

Major areas of study include environmental sciences (biology, toxicology, epidemiology), Federal and international law, policy, social sciences, community studies.

Description:

This program will explore the broad conditions that shape environmental health, both human health and the ecosystem context. We will be moving across and between questions of science, public policy (from municipal to international) and social justice (workings of non-governmental organizations). We will dedicate ourselves to bridging the understanding among scientific, policy and social perspectives and examine emerging strategies and solutions, from community-based monitoring to U.N. negotiations. The chemical, biologic and physical /radio active risks of modern life will be considered, with an emphasis on industrial pollutants. We will examine models, evidence and debates about the sources, causal connections and impacts of environmental hazards. We will be learning about existing and emergent science in conjunction with evolving systems of law, regulation and the broad array of community response. We will also examine environmental health in the broader context of and debates about key frameworks of population, consumption, and sustainability. Through out the program, students will learn from a range of learning approaches – lecture, lab, computer-based toxicology, guest presentation, seminar, visits and collaborations with regional experts, officials and activists.

Environmental health is inherently interdisciplinary. We will therefore integrate science with policy and social justice movements. From the scientific perspective, we will examine the toxicity of environmental chemical (biologic, physical/radioactive) agents, applying principles of toxicology, epidemiology, molecular & cellular biology. Specifically this approach will investigate types of pollutants, dose-response relationships, exposure route and level, type of biologic effect and individual susceptibility. Students will examine the strengths and weaknesses of toxicity testing methodology; and learn about the distinction between “association” and “causation.” From a social science perspective, we will consider the importance of precaution and citizen right-to-know as part of public practice. We will examine debates about the relation of industrial conditions to individual susceptibility and life style. We will develop a comparative sense of how different countries are dealing with these factors and how this becomes a source of conflict, from neighborhood disputes about waste disposal to cross border transportation of hazards.

Program Content:

In the fall there will be strong focus on scientific foundations and lab experience. We will examine the legal structure of environmental hazards via specific federal legislation, international protocols and aspects of administrative, criminal and civil law that govern release, disposal and proposed clean up. Winter quarter will focus on selecting specific topics such as persistent organic pollutants, heavy metals and carcinogens in their scientific development and their political complexity. With the Puget Sound region as a context, we will have opportunity to see how some areas are being debated – from city councils to Washington State Legislature to neighboring counties. Spring continues with increasing focus on student projects (both individual and group) building on both natural and social science features: to deepen our knowledge and engage with scientists, agencies, environmental health and community activists.

Format for the program will include guest lectures from agency staff and officials in the field. We will read literature that helps us answer how we can work as change agents to transform political and economic agendas to achieve better outcomes specific health issues facing the state and the world. These will focus on the realities and hopefully on new and innovative strategies for the future. Labs will provide opportunities to enrich our knowledge of scientific discovery and seminars will provide opportunity to contemplate the consequences of these applications and to create an understanding of toxins issues that is effective/responsive to the needs and rights of the public.

Program Schedule

Tuesday:	9:00 – 12:00 1:00 – 3:00	Lecture in Lecture Hall 5 (LH 5) Seminar in Seminar II C3107 and C3109
Wednesday:	8:00 – 12:00	Lab I 1051 or Lab II 2207
Friday:	9:00 – 10:15 10:30 - 12:00 1:30 – 3:30	Policy Lecture in Seminar II E 1107 Workshop in CAL Toxicology Lecture in LH 2

Required Textbooks:

1. Ira S. Richards *Principles and Practice of Toxicology in Public Health*, Jones and Bartlett
2. Susan Buck *Understanding the Administration of Environmental Law*, Duke Press 1991
3. Rosalind Pollack Petchesky *Global Prescriptions: Gendering, Health and Human Rights*, Zed Press 2003
4. Frank Ackerman *Poisoned for Pennies: The Economics of Toxics and Precaution*, Island Press 2008
5. Angus Wright *Death of Ramon Gonzalez: The Modern Agricultural Dilemma* University of Texas 1992

Suggested textbooks:

1. Curtis D. Klaassen and John B. Watkins, Casarett & Doull's Toxicology McGraw-Hill Professional, ISBN: 0071347216. **Highly** recommended for those who are interested in future studies in Toxicology.
2. Curtis D. Klaassen and John B. Watkins Casarett & Doull's Essentials of Toxicology McGraw-Hill Professional; ISBN: 0071389148 (shorter version of the one above, if available)
3. McGraw Hill electronic custom text in two parts (I, II), including cell biology, physiology, epidemiology and statistics chapters; Part I (Cell Biology, Physiology and Epidemiology) ISBN: 0-390-46791X (\$46.32 plus any sales tax) and Part II (Statistics) ISBN: 0-390-467928 (\$27.27 plus any sales tax) available through the website: <https://ebooks.primisonline.com/eBookstore/index.jsp>. Select the "Custom e-books" and follow the instructions there. **Highly** recommended to those who have no related textbooks.
4. Moyses Szklo and F. Javier Nieto *Epidemiology: Beyond the Basics*, The Aspen Publication, ISBN: 0834206188 (Basic but detailed epidemiology text)

Required Seminar Reading:

1. Agriculture Linked To Frog Sexual Abnormalities
<http://www.sciencedaily.com/releases/2008/07/080703160749.htm>
2. Peter Barnes *Who Owns the Sky?* Zed Publishers 2002
3. Arthur Miller *An Enemy of the People* (adaptation of an Ibsen play) Penguin 1979
4. Colleen Moore *Silent Scourge: Children, Pollution and Why Scientists Disagree*, Oxford University 2003
5. Duff Wilson *Fateful Harvest*, University of Washington Press 1994 available at the TESC Bookstore.

Journal Articles:

1. Costanza, Robert. Visions of (Unpredictable) Futures and Their Use in Policy Analysis *Ecology and Society* (2000) Volume 4, Number 1, Article 5
2. Santiago-Rivera, et al., (1998) Building Community-Based Research Partnership: Lessons from the Mohawk Nation of Akwesasne *Journal of Community Psychology* V. 26 n. 2 p. 163-174.
3. Many more articles will be posted on the website arranged by week

Learning Objectives [to]:Law and Policy:

- Develop the critical ability to analyze policy structure – on a federal international and state level.
- Look at the history of causality; the shift in priorities and levels of awareness on the part of the public.
- Recognize how legal structures may be ineffective in actually providing a healthful environment
- Learn some of the historical features of the process of discovery as it relates, particularly, to issues such as population dynamics, hazardous waste and climate change.
- Understand a number of competing arguments about appropriate research methodologies.

Toxicology:

- Understand the principles of normal cell function and physiology
- Understand the properties of chemical substances
- Develop an understanding of the molecular nature of toxicity
- Develop a critical ability to understand and interpret scientific information from the literature
- Achieve quantitative reasoning in evaluating toxicological information
- Develop an understanding of the basics of epidemiological studies

Assignments and Credits

1. Students must attend Lecture Hall 5, Seminar II E 1107 or Computer Application Lab (CAL) workshops as one group on Tuesday and Friday and complete assigned reading; Students must complete quizzes and CAL assignments, a mid term exam in week 5 and a final project assignment in week 10 to achieve full program credit in toxicology and environmental law.
2. Students will be divided into two groups (A and B) for weekly Wednesday toxicology labs in Lab I 1051 and Environmental Justice workshops in Lab II 2207. There will be weekly assignments scheduled for each for full program credit.
3. Students will be divided into two groups for weekly Tuesday afternoon seminar in Seminar II C 3107 or C 3109. Students must complete two short papers indicated for weeks 3 and 7 on your syllabus to achieve full program credit.

Students will receive 16 credits at the end of each quarter if all course requirements have been satisfactory complete to meet course objectives. Credits will be upper division and these will be divided between environmental law and toxicology, with credits allocated for seminar participation; laboratory or workshop assignments and lecture materials. Denial of credit decisions will be made by the faculty team. Denial of credit may result in expulsion from the program. Plagiarism (i.e., using other people's work as your own), failing to complete assignments, completing one or more assignments late (without prior arrangements) and multiple absences may constitute causes for loss of credit. Students will be evaluated based on their progress towards the learning goals. This will be assessed from class, seminar, and assignment performance by the faculty team.

General Expectations

- Take personal responsibility for and be actively involved in your own intellectual development
- Attend all class meetings - if you must miss, let the faculty member know, in advance via email or phone
- Be socially responsible, professional, and considerate to your colleagues when working together
- Be on time and come prepared for all class meetings (having completed the assigned reading)
- Apply professional standards in all of your work
- Recognize and utilize appropriate problem solving techniques and literature
- Use appropriate campus resources for class materials (writing center, library, learning resource center).

Fall Schedule:

	DATE	TOPICS/ACTIVITIES	READINGS	SEMINAR
Week 1	TUE Sep 30	<u>Lecture</u> <ul style="list-style-type: none"> Intro to Toxicology; Types of toxicity (Maria) Introduction to Environmental Law (Cheri) 	<u>Readings</u> <ul style="list-style-type: none"> Richards, Ch. 1,3,4 C&D Tox. Ch. 1 Buck, Ch 1 of <i>Environmental Law</i> 	<u>Seminar</u> Introduction <ul style="list-style-type: none"> Lou Guilette, "Frogs' Sexual Abnormalities"
	WED	<u>Lab I – Group A</u> <ul style="list-style-type: none"> Solutions, dilutions <u>Workshop EJ – Group B</u> <ul style="list-style-type: none"> TBD 	Lab Instructions Handout	
	FRI Oct 03	<u>Lecture</u> <ul style="list-style-type: none"> Redistributive Policy Env. Movements (Cheri) Dose response (Maria) 	<u>Reading:</u> <ul style="list-style-type: none"> Buck, Ch 2 of <i>Environmental Law</i> Richards, Ch. 6 C&D Tox. Ch. 2 	<u>Workshop</u> <ul style="list-style-type: none"> Historical account of env. health - Global burden of disease Literature Resources
Week 2	TUE Oct 7 WHITE PAPER	<u>Lecture</u> <ul style="list-style-type: none"> Chemical structures, Solubility, ionization (Maria) Superfund and SARA Amendments (Cheri) 	<u>Readings</u> <ul style="list-style-type: none"> Richards, Ch. 2 Chapters on e-reserve (library) Buck, Ch 3-4 of <i>Environmental Law</i> 	<u>Seminar</u> <ul style="list-style-type: none"> Arthur Miller <i>Enemy of the People</i> <p>Paper Due</p>
	WED	<u>Lab I – Group B</u> <ul style="list-style-type: none"> Solutions, dilutions <u>Workshop EJ – Group A</u> <ul style="list-style-type: none"> TBD 	Lab Instructions Handout	
	FRI Oct 10	<u>Lecture</u> <ul style="list-style-type: none"> Pollution Control Laws Haz. Substances (Cheri) Cell and tissue structure (Maria) 	<u>Readings</u> <ul style="list-style-type: none"> Buck, Ch 5-6 of <i>Environmental Law</i> E-book Gunstream Ch. 2,3,4 	<u>Workshop</u> <ul style="list-style-type: none"> CAL Computer lab: Data graphing descriptive stats E-book; Kuzma-Bohn. Ch. 3,4
Week 3	TUE Oct 14	<u>Lecture</u> <ul style="list-style-type: none"> Cell and tissue function (Maria) International Envir. Accords (Cheri) 	<u>Readings</u> <ul style="list-style-type: none"> E-book Fox Ch. 1-3 Buck Ch 7 of <i>Environmental Law</i> 	<u>Seminar</u> <ul style="list-style-type: none"> Barnes <i>Sky</i> first half
	WED	<u>Lab II – Groups A and B</u> <ul style="list-style-type: none"> Cell structure, staining 	Lab Instructions Handout	
	FRI Oct 17	<u>Lecture</u> <ul style="list-style-type: none"> International Environmental Accords (Cheri) ADME (Maria) 	<u>Readings</u> <ul style="list-style-type: none"> Review OSHA, EPCRA ESA Treaty Law Handout Richards, Ch. 7,8 C&D Tox. Ch 5 	<u>Workshop</u> <ul style="list-style-type: none"> CAL – Probability E-book; Kuzma-Bohn. Ch. 5

Week 4	TUE Oct 21 SEM PAPER	<u>Lecture</u> <ul style="list-style-type: none"> ▪ Biotransformation (Maria) ▪ Global Issues in Population (Cheri) 	<u>Readings</u> <ul style="list-style-type: none"> ▪ Richards, ch.9 ▪ C&D Tox. Ch. 6 ▪ Pollack Petchesky <i>Global Rx</i> Ch. 3 	<u>Seminar</u> <ul style="list-style-type: none"> ▪ Barnes <i>Sky</i> (all) Paper due
	WED	<u>LAB III – Group A</u> <ul style="list-style-type: none"> • Partition coefficient 	Lab Instructions Handout	
	FRI Oct 24	<u>Lecture</u> <ul style="list-style-type: none"> ▪ The United Nations’ Authority (Cheri) ▪ Toxicokinetics (Maria) 	<u>Readings</u> <ul style="list-style-type: none"> ▪ Pollack Petchesky <i>Global Rx</i> Ch 1-2 ▪ C&D Tox. Ch. 7 	<u>Workshop</u> <ul style="list-style-type: none"> ▪ CAL – Prob. Distrib., Estimation E-book; Kuzma-Bohn. Ch. 6,7
Week 5	TUE Oct 28	<u>Lecture</u> <ul style="list-style-type: none"> ▪ Mechanisms of toxicity and repair (Maria) ▪ International Law & Trade Relations (Cheri) 	<u>Readings</u> <ul style="list-style-type: none"> ▪ C&D Tox Ch. 3 ▪ Petchesky Equity v Productivity Ch. 4 	In class mid-term exam (no seminar)
	WED	<u>Lab III – Group B</u> <ul style="list-style-type: none"> • Partition coefficient 	Lab Instructions Handout	
	FRI Oct 31	<u>Guest Speaker</u> <ul style="list-style-type: none"> ▪ Jude Van Buren, Dept. of Health <u>Seminar:</u> <ul style="list-style-type: none"> ▪ Santiago-Rivera (all) 	<u>Readings</u> TBD	<u>Workshop</u> <ul style="list-style-type: none"> ▪ CAL – Hypothesis testing; E-book, Kuzma-Bohn. Ch. 8
Week 6	TUE Nov 4	<u>Lecture</u> <ul style="list-style-type: none"> ▪ Enzyme function, kinetics (Maria) ▪ Pesticides – phosphates chlorides (Cheri) 	<u>Readings</u> <ul style="list-style-type: none"> • Biochemistry chapters on e-reserve • Wright Ch. 1-2 <i>Death of Ramon Gonzalez</i> 	<u>Seminar</u> <ul style="list-style-type: none"> ▪ Colleen Moore <i>Scourge</i> Ch. 1-3 Lead Mercury PCBs
	WED	<u>Lab IV – Group A</u> <ul style="list-style-type: none"> • Extraction of pesticide from milk 	Lab Instructions Handout	
	FRI Nov 7	<u>Lecture</u> <ul style="list-style-type: none"> ▪ Precaution and Type I/II errors (Cheri) ▪ Receptor function (ANS) (Maria) 	<u>Reading</u> <ul style="list-style-type: none"> • Wright Ch. 3-4 <i>The Modern Agricultural</i> • TBD 	<u>Workshop</u> <ul style="list-style-type: none"> ▪ CAL – Enzyme kinetics, Lab data

Week 7	<p>TUE Nov 11 SEM PAPER</p>	<p><u>Lecture</u></p> <ul style="list-style-type: none"> ▪ Pesticide mechanisms (Maria) ▪ Land tenure (Cheri) 	<p><u>Readings</u></p> <ul style="list-style-type: none"> ▪ Richards, Ch. 17 ▪ C&D Tox. Ch. 16,22 ▪ Wright Ch. 5 	<p><u>Seminar</u></p> <ul style="list-style-type: none"> ▪ Colleen Moore <i>Scourge</i> Ch. 4-6 Organophosphates Noise
	WED	<p><u>Lab IV – Group B</u></p> <ul style="list-style-type: none"> • Extraction of pesticide from milk <p><u>Workshop EJ – Group A</u></p> <ul style="list-style-type: none"> • TBD 	Lab Instructions Handout	
	FRI Nov 14	<p><u>Field Trip</u> Washington Toxics Coalition Water Tour</p>	<p><u>Location</u></p> <ul style="list-style-type: none"> • Duwamish Superfund Site in Seattle 	<p><u>All Day</u> Pack a lunch!</p>
Week 8	<p>TUE Nov 18 Final Project Outline</p>	<p><u>Lecture</u></p> <ul style="list-style-type: none"> ▪ Air pollution, Environmental fate (Maria) <p><u>Video/Film</u></p> <ul style="list-style-type: none"> ▪ Trading Democracy (Canada/Mexico) 	<p><u>Readings</u></p> <ul style="list-style-type: none"> ▪ Richards, Ch. 5,16 ▪ C&D Tox. Ch. 15,28 ▪ Ackerman Ch. 1-4 <i>Poisoned 4 Pennies</i> 	<p><u>Seminar</u></p> <ul style="list-style-type: none"> ▪ Duff Wilson <i>Fateful Harvest</i> Cancers Lead Neuro-behavior
	WED	<p><u>Lab V – Group A</u></p> <ul style="list-style-type: none"> ▪ AChE activity and inhibition <p><u>Workshop EJ – Group B</u> No workshop: Cheri out</p>	Lab Instructions Handout	
	FRI Nov 21	<p><u>Guest Speaker</u></p> <ul style="list-style-type: none"> ▪ John Means Ecology Brownfield Program <p><u>Lecture</u></p> <ul style="list-style-type: none"> ▪ Laboratory tox. and QSAR (Maria) 	<p><u>Readings</u></p> <ul style="list-style-type: none"> ▪ Wright - end Gonzalez <i>Ramon: Pesticide Dilemma</i> • Richards, ch. 20, and readings on the website 	<p><u>Workshop</u></p> <ul style="list-style-type: none"> • CAL – Single sample t-test, E-book; Kuzma-Bohn. Ch.8
Nov 24-31	THANKSGIVING HOLIDAY			

Week 9	TUE Dec 2	<u>Lecture:</u> <ul style="list-style-type: none"> Epidemiology Incidence rate (Maria) Cost Benefit Analyses in RA (Cheri) 	<u>Readings:</u> <ul style="list-style-type: none"> E-book Rosignol Ch. 4,6 Ackerman Ch. 5-8 The Economics of Precaution 	<u>Seminar:</u> <ul style="list-style-type: none"> Duff Wilson <i>Fateful Harvest</i> Atrazine Mad Cow Asthma
	WED	<u>Lab V – Group B</u> <ul style="list-style-type: none"> AChE activity and inhibition 	Lab Instructions Handout	
	FRI Dec 5	<u>Lecture:</u> <ul style="list-style-type: none"> Epi Causation (Maria) <u>Guest Speaker</u> <ul style="list-style-type: none"> Patty Martin (tentative) 	<u>Readings:</u> <ul style="list-style-type: none"> E-book Rosignol Ch. 8 Ackerman Ch 9-end <i>Poisoned 4 Pennies</i> 	<u>Workshop</u> <ul style="list-style-type: none"> Asthma epidemic Problem solving exercise
Week10	TUE Dec 9	<u>Student Presentations</u> <ul style="list-style-type: none"> Student Group One Student Group Two Student Group Three 	<u>Reading:</u>	<u>Student Presentations</u> <ul style="list-style-type: none"> Student Group Four Student Group Five Student Group Six
	WED	Lab clean up (Groups A and B)		
	FRI Dec 12 Portfolio	<u>Student Presentations</u> <ul style="list-style-type: none"> Student Group Seven Student Group Eight Student Group Nine 	<u>Reading:</u> <ul style="list-style-type: none"> TBA 	<u>Presentations and Pot Luck</u> <ul style="list-style-type: none"> Student Group Ten Student Group Eleven Student Group Twelve

Expectations of Students and faculty:

Our program covenant code is to promote a cooperative, supportive atmosphere within the community; give everyone opportunity for self-reflection and expression; use high standards in reading the text and preparing our papers, lectures, and comments in seminar; handle all disputes in a spirit of goodwill and discuss any and all problems involving others directly with the individuals involved (so long as the concerned party feels safe doing so), with the right to support from other program members during those discussions. We will all abide by the social contract: WAC 174-121-010 College philosophy. <http://apps.leg.wa.gov/WAC/default.aspx?cite=174-121-010>

We will abide by the student conduct code: Chapter 174-120 WAC

Student Conduct Code & Grievance/Appeals Process

<http://search.leg.wa.gov/wslwac/WAC%20174%20%20TITLE/WAC%20174%20-120%20%20CHAPTER/WAC%20174%20-120%20%20CHAPTER.htm>

We will abide by the non-discrimination policies and procedures at TESC:

<http://www.evergreen.edu/policies/policies/nondiscriminationpoliciesandprocedures>

We will respect the indoor air quality policy for those who may be sensitive to artificial fragrances and to the potentially harmful effects of personal hygiene products <http://www.evergreen.edu/policies/policies/airquality>

Participation & Attendance:

Students are required to attend each class meeting. *Participation includes speaking in class, listening to others, taking notes, listening to and dialoging with the guest speakers.* Makeup work must be completed by the end of the quarter to ensure full receipt of course credit. Guests are welcome to visit our learning community during class time and seminar meetings with discretionary approval from course faculty in advance of the requested visit. It is the host student's responsibility to contact the faculty with details about the requested guest visit and await approval. Guests must abide by all social contract conduct code, nondiscrimination and indoor air quality policy guidelines.

Evaluation:

- Written self-evaluations and seminar faculty evaluations are required at the end of each quarter and will be discussed along with faculty evaluations of students in conferences scheduled for the last week of the quarter – evaluation week 11. Students may elect to submit faculty evaluations to Program Secretaries.
- End-of-quarter conferences can be arranged either as in person meetings at the office of the faculty or via email.
- Including a self-evaluation in your transcript is optional.
- Students are required to maintain a portfolio, which will be submitted to the faculty at the end of the quarter (Week 10).
- Students will be evaluated in writing at the end of the quarter by the faculty. The faculty member agrees to submit student evaluations to the program secretary in a timely fashion.

Learning Styles:

We all have different ways of acquiring new knowledge. Therefore, faculty will actively work towards providing information in multiple formats: tactile, auditory, visual, experiential, etc. However, style applications are limited to means appropriate for the classroom environment. Consult your seminar faculty to discuss learning style options.

Multiculturalism & Diversity:

Faculty and students will actively work towards contextually weaving multiculturalism and diversity throughout our learning as related to readings, lectures, seminar and group projects. In a learning community students and faculty share the responsibility for the teaching and learning environment. We are encouraged to add to the existing content by incorporating relevant experiences in dialogue and by presenting current events regarding public service. Multiculturalism and diversity is understood as: aiming to promote constructive community discourse about issues

of culture, power and life-style differences including but not limited to race, ethnicity, color, nationality, sex, gender, gender identity, gender expression, class, sexual orientation, age, religion, (dis)ability, and veteran status.

Accommodations:

Accommodations will be provided for any student who desires them through a working relationship with Access Services, the Writing Center and the Quantitative and Symbolic Reasoning Center. To request academic accommodations due to a disability please contact the office of Access Services for Students with Disabilities (867-6348 or 6364). If the student is already working with the office of Access Services the faculty should have received a letter indicating the student has a disability that requires accommodation. If any student has a health condition or disability that may require accommodations in order to effectively participate in this class, please do the following: Contact faculty after class and/or Contact Access Services in Library 1407-D, 867-6348. Information about a disability or health condition will be regarded as confidential. Please refer to TESC's Students With Disabilities Policy: <http://www.evergreen.edu/policies/g-studentada.htm>.

Essay and Midterm Assignments:

There will be short workshop assignments, described in greater detail as we go along, that will require students to systematically review and independently research current issues. There will be an in-class midterm examination mid quarter during which students will be responsible for answering select questions and identifying key concepts discussed in the reading materials and texts assigned and required for lecture. Please come to seminar with key pages in the reading that you have identified as central; as compelling or as particularly confusing to highlight in seminar discussion of these books. Seminar is a very different task than lecture. It will require all students to think about the materials and to prepare key questions in advance. Pre-formed papers on the reading also complement seminar discussion.

All written work will be of high quality, grammatically correct, clear, without spelling errors. Please request resource writing assistance from the campus writing center if you have no other means of gaining an essential proof reader for your final copy. All papers must be grammar and spell-checked or they will be returned to you by the faculty. The titles of all books must either be underlined or expressed in *italics*. If you are citing a shorter article, or monograph and not a complete text, the name of the article will be encased in quotes and the name of the longer journal from which this article was derived will be underlined or expressed in *italics*. This is the case as well with articles from a newspaper.

The objective of a series of short papers required of seminar participation is to analyze main ideas, assertions and assumptions presented by the authors of listed seminar reading. All short essay response assignments will be 3 - 4 pages in length (typed, double-spaced, preferably 12 point font.) Head papers with your name, program name, date and your own title (as distinct from the title of the book. Readers will always want to know which aspects or themes you have selected for discussion from a larger study.) It is an excellent idea to integrate relevant materials into a paper. Include examples of each point you make, in application. *Provide the page number and source citation for quotes or any statistics.* Always have a reference and citation page so that the reader will know where the number came from and gain a better idea of the quality of its source or the limitations by which it was derived.

Final project – Oral and Written Report:

Due on the last days of class. For your project, you are asked to submit a report (up to 4 pages long) on a topic of interest, related to environmental human health that has been covered in class in the fall quarter that you would like to explore in greater detail. You will approach this topic in a predominantly toxicological manner and include relevant policies and regulations. Project goals are to begin to familiarize yourself with resources (public toxicology databases, peer reviewed articles, regulatory agency data) relating to the topic of choice to present a reasonably succinct account that will include:

- Sources of hazard
- Exposure routes and typical range of exposure levels

- Regulatory standards if available
- Mechanisms of toxicity (demonstrated or hypothesized)
- Evidence of toxicity including study source
- Strength of evidence for causative association
- Any prevention strategies

Tips and suggestions: Select a specific hazard - e.g. not air, water or soil pollution in general, but a specific pollutant in a specific location. Considering exposure, think of “when”, “where”, “how long”, “who” “why”, “how”, “how frequently” and “how much”. Considering effect, address the acute or chronic nature. What sort of an alternative might be more effective? You may select any hazard whether perceived, contested, acknowledged or unresolved. Cite all information resources (websites) as you go, so you’re not left with unreferenced statements that are hard to backtrack.

Timeline:

Week 8 – Tuesday, Nov. 18th: final project outline (2 pages)

Week 10 – Tuesday Dec. 9th or 12th: Final project papers are due on the date that project presentations are scheduled.

These projects are preparatory for larger research winter and spring quarter that will focus on specific topics such as persistent organic pollutants, endocrine disrupters, heavy metals and carcinogens with the Puget Sound region as a context. We will have additional opportunities to go out into the field; to see how some areas are being debated- from city councils to Washington State Legislature to neighboring representatives of organizations such as the Washington Toxics Coalition Body Burden Project. As we progress with student projects (both individual and group), we will build on both natural and social science features to contemplate the consequences of applications and to create a more thorough understanding of the field of toxicology and specific toxins. We will deepen our knowledge of how to engage with community activists and agencies to strengthen the rights of the public to know about policy debates; and to discover more about the differences in the way we address acute or chronic, voluntary or involuntary exposures and multiple exposure risk ratios.

Topics anticipated in winter quarter will include genotoxic and non-genotoxic carcinogens, organochlorines, metals, endocrine disrupters, radiation, risk assessment approaches, genetic susceptibility, children risk, mixtures, multiple exposures and toxic interactions that each lend to our overall understanding.