

FY1100 Great Problems Seminar: Biosphere, Atmosphere, and Human Fears
Worcester Polytechnic Institute
Worcester, Massachusetts
Abbreviated Course Syllabus - A and B terms
Profs. Marja Bakermans (BBT) and Geoff Pfeifer (HUA)

1. Instructor and PLA Information

2. Information about Course Support Staff

3. Course Goals and Description

With a growing world population, changes on the landscape are increasingly compounding environmental problems. In this course we will explore the complex ecological challenges faced in today's world. We will examine causes, trends, impacts, and solutions to land use changes, climate variability, loss of habitat and biodiversity, and other similar ecological problems from scientific, social, ethical, philosophical, and technological perspectives to gain a more complete picture of such challenges and possible ways of addressing them. This is the key to becoming effective citizens of the 21st century.

In this class, students will work to accomplish the following:

- a. Identify critical ecological issues of local, regional, and/or global importance
- b. Understand the opportunities and risks of environmental changes
- c. Critically analyze, interpret, and evaluate the complexities of ecological issues.
- d. Know the key stakeholders including scientists, political leaders, business leaders, philanthropists, and citizens.

Learning Objectives (Student Learning Outcomes)

Through our work together, we will meet the learning objectives of the Great Problems Seminar.

Students will

- a. be effective in oral, written, and visual communication,
- b. function effectively both individually and on teams,
- c. be able to identify, analyze, and solve problems creatively through sustained critical investigation,
- d. be able to make connections between disciplines and to integrate information from multiple sources,
- e. be aware of how their decisions affect and are affected by other individuals and groups,
- f. be aware of personal, societal, and professional standards, and
- g. have the skills, diligence, and commitment to excellence needed to engage in lifelong learning.

4. Required Course Materials

Readings will be posted on the course page found on myWPI or via the library

Wolfe, J. 2010. Team Writing: A guide to working in groups. Bedford. Boston, MA.

McDonough, W. and M. Braungart. 2013. The Upcycle: Beyond sustainability- Designing for abundance. Melcher Media, New York, NY.

You will be required to read the above book during the break between terms. We expect that you have read this by the first day of class on Thursday, Oct. 29th.



5. Tentative Schedule (A term)

Session 1 (8/28) Introduction

Readings: Earth Systems, Chapter 1 (available on MyWPI)

Kate Soper "What is Nature: Culture Politics and the Non-Human" (MyWPI)

Assignment 1: Self and Nature Assignment (Due 9/4)

Session 2 (9/1) Global change - Land / ATC Visit on presentations

Reading: CH 1 in Land Use and Climate Change by S.C. Rai. 2009 (available online)

Foley et al. 2005. Global Consequences of Land Use (MyWPI)

Assignments 2 & 3: Land Change /Annotated Bibliography Assignment (Due 9/8)

Session 3 (9/4) Ethics / Library Visit

Assignment 1 due (Self and Nature)

Readings: Ethics (MyWPI)

Assignment 4: Ethics Assignment 1 (Due 9/11)

Session 4 (9/8) Land Change Presentations

Assignments 2 & 3 due (Land Use Change Assignment)

Assignment 5: Presentation summary (Due 9/15)

Session 5 (9/11) Guest- Bonnie Walker / Environmental ethics

Assignment 4 due (Ethics assignment 1)

Readings: Sanders, "Reading Leopold" (MyWPI)

Leopold, "The Land Ethic" (MyWPI)

Session 6 (9/15) Global Change - Land / Climate

Assignment 5 due (Presentation summary)

Readings: IPCC Climate Change 2013 Report -The Physical Science Basis (MyWPI)

Climate Literacy: The Essential Principles of Climate Science (MyWPI)

Research Notebook 1: due by end of class

Assignment 6: Climate change jigsaw (Due 9/22)

Session 7 (9/18) Ethics, social, and policy issues (Climate Change/Environmental Justice)

Readings: Sand Wars, Oceans of Trouble, A cooling Trend (MyWPI)

Kahan. D. 2012. Why we are poles apart on climate change. (MyWPI)

Chapter 1 in *State of the World*

Assignment 7: Crosstown Biodiversity (due 9/29)

Research Notebook 2 (due 9/25)

Session 8 (9/22) Climate Change Jigsaw

Assignment 6 due (Climate Change Jigsaw)

Readings: Chapter 2 in *State of the World*

Pages 1 - 13 in Linkage between Biodiversity and Land Use Informatics and Climate Change (MyWPI)

Assignment 8: Ethics Assignment 2 (due 10/2)



Session 9 (9/25) Global change - Ecosystems / Biodiversity

Research Notebook 2 due

Readings: Oliver and Morecroft. 2014. (MyWPI)

Meadows, “Biodiversity: The Key to Saving Life on Earth” (MyWPI) Species Case Studies (MyWPI)

Session 10 (9/29): Biodiversity Presentations / Guest: Martin Burt

Assignment 7 due (Crosstown Biodiversity)

Readings: Machovina et. al. 2015 (MyWPI)

Assignment 9: Pitch a Project (due 10/6)

Session 11 (10/2) Pick Projects; Possible visits from Community Partner

Assignment 8 due (Ethics Assignment 2)

Session 12 (10/6) Pitch a project presentations

Assignment 9 due (Pitch a project)

Session 13 (10/9) Research Design / Work day / Library consultation

Readings: Pages 110-120 in *Research Design* by J. Creswell (MyWPI)

Survey Design Best Practices by Paula Quinn Consulting (MyWPI)

Session 14 (10/13) Project Proposal due and Presentations

6. Grading Policy/Summary (A term)

1. Assignments (9)- 45% (5% for each assignment)
2. Project Proposal- 20%
3. Project proposal presentation- 15%
4. Attendance and Participation- 10%
5. Research Notebook- 10%

Tentative Schedule (B term)

Session 1 (10-29) Upcycle

Readings: The Upcycle (read this between terms)

Assignment 1: Upcycle reflection/questions (Due 11/5)

Assignment 2: Revised proposal (Due 11/9)

Research Notebook: Research Notebook Entry #1 (due 11/2)

Session 2 (11-2) Teamwork/group problem solving

Research Notebook entry #1 due

Readings: CHs 1 & 3 in *Team Writing* book

ALL on MyWPI: Understanding Teams (Chap 1); Team Beginnings (Chap 3)

Assignments 3 & 4: Contact assignments, part 1 and 2 (Due 11/9 and 11/16)



Session 3 (11-5) Reading discussion / team meetings

Assignment 1 due: Upcycle

Readings: CHs 2 & 4 in *Team Writing*

Assignment 5: Blog # 1 (Due 11/12)

Session 4 (11-9) Work day / Library in-class work

Assignment 2 due: Revised proposal

Assignment 3 due: Contact assignment, part 1

Research Notebook entry #2 due

Readings: CH 8 in *Team Writing* and CH 11 (Problem Solving) on myWPI

Assignment 6: Solution and presentation (due 11/16)

Session 5 (11-12) Technology and Society Discussion

Assignment 5 due: Blog # 1– *Post questions and responses before class*

Readings: On myWPI

Video: NOVA: Megastorm Aftermath

Assignment 7: Blog # 2 (Due 11/19)

Session 6 (11-16) Project Solution Presentation

Assignment 4 due: Contact assignment, part 2

Research Notebook entry #3 due

Assignment 6 due: Solution and presentation

Readings: CHs 5 & 6 in *Team Writing*

Assignment 8: Group progress presentation (due 11/23)

Session 7 (11-19) Case study, Coffee

Assignment 7 due: Blog #2 - *Post questions and responses before class*

Readings: On myWPI

Session 8 (11-23) Project Progress Presentation

Assignment 8 due: Group progress presentation

Readings: CH 7 in *Team Writing*

Research Notebook entry #4 due

Session 9 (11-30) ATC presentation about posters / Work on projects

Research Notebook entry #5 due

Assignment 9: Poster draft (Due 12/7)

Assignment: Final Report (Due 12/17)

Session 10 (12-3) Work day

Session 11 (12-7) Present Draft Poster

Research Notebook entry #6 due

Assignment 9 due: Present poster draft



Session 12 (12-10) Poster Practice Session (pick up posters before class)

Session 13 (12-14) **Poster Session 10-12 pm** (this replaces class time)

Session 14 (R 12-17) Discussion and feedback session

Final Report Due before class

Research Notebook entry #7 due - Statement of Learning

IMPORTANT NOTE: The above schedule, policies, procedures, and assignments in this course are subject to change. Professors Pfeifer and Bakermans reserve the right to make changes to the Course Syllabus throughout the term.

6. Grading Policy/Summary (B term)

1. Poster and poster presentation – 20%
2. Written report – 15%
3. Revised proposal (i.e., Assignment 2)– 10%
4. Solution proposal (I.e., Assignment 6)– 10%
5. Research notebook (7 total)– 15%
6. Assignments (Assignments 1, 3-5, 7-9; 7 total) - 20%
7. Attendance and participation – 10%

7. Teaching Methodology

8. Course Policies / Student Responsibilities

9. Additional assignment information

[Please feel free to contact me for additional information: mbakermans@wpi.edu]

