

ENVIRONMENTAL STUDIES 132
Spring Semester 2010
Dickinson College, Carlisle, PA
(Also Available on Blackboard With Web Hyperlinks)

Prerequisite: ES 131, Advanced Placement (APES), or one semester natural science

Instructor: **Michael Heiman** (110 Kaufman): Office Phone: 245-1338
Office Hours: W 10 AM-Noon and TH 2:00-4:00 PM + by Appt.

Class Meeting: Lecture - Tuesday and Thursday 10:30 - 11:45 AM in Tome 117

Please be on time for lectures--late attendance will be noted.

Lab - T 1:30-4:30 PM (and on occasion starting earlier and running later) in Kaufman 109

Required Texts and Reading: (For sale at bookstore and on reserve at library, or posted to Blackboard)

- a. G. Tyler Miller, Jr. and Scott Spoolman *Environmental Science* (13th ed.-2010), Belmont, CA: CENGAGE/Brooks-Cole (**M**) Approximately 2/3 of the text is assigned. You may use an earlier edition (12th) as long as you figure out the appropriate readings from those assigned from the required edition.
- b. Class reading assignments posted to **Blackboard** (as identified in the schedule and/or announced in class)
- c. Bi-weekly (minimum) access to environmental reporting by *The New York Times* (by subscription or on line at www.nyt.com) (To keep abreast of breaking environmental issues)

Class Requirements:

- a. Active verbal participation in class and on lab field trips. 10%
- b. Exam #1 on Tuesday, Feb. 23..... 10%
- c. Exam # 2 on Thursday, April 6..... 10%
- d. Cumulative Final Exam on Thursday, May 13 at 2 PM... 20%
- e. Class/Laboratory Project:
 - Data Analysis Section of Audit due March 1 5 %
 - Complete Draft due April 19..... 20 %,
 - Final Revision Due May 7..... 10 %
 - Project Presentation in Class..... 5 %
- f. Prepared Questions for Field Trip Labs (2/lab typed in advance)
 - on 2/23, 3/9, 3/23, 3/30, 4/6, 4/20, and 4/27 4%
- g. Two Co-curricular events (two-page minimum typed write-up each)... 6%

TRI Project: Working individually or, preferably, in groups of 2-3 (maximum), students are encouraged to prepare a toxic waste audit for a major industry or waste-disposal facility in a region that has, or will be, the subject of past or future ES Department fieldwork. In an attempt to make the report relevant and useful, these areas include, and are not limited to, the infamous "Cancer Alley" region of Louisiana between Baton Rouge and New Orleans; the industrialized "Environmental Justice" community of Chester, PA; the industrial l region surrounding Pittsburgh, PA; and, in consultation with Professor Heiman, your home community should it host significant industry that has attracted attention from environmental and social justice advocates.

Students may report on a single reporting entity or target an entire community and audit several smaller reporting facilities in that community. The audit will include some consideration of types, amounts, and physical properties of EPA-listed chemicals stored, used, and/or released into the environment; the known human and environmental health hazards associated with the chemicals; and measures proposed and taken to reduce use of

the chemical and to assure proper disposal. In addition, the actual environmental impact of waste release and disposal will be investigated and contact encouraged with managers of the audited facilities as well as with local residents who are working on waste issues in the community.

Details on the procedure are covered in class handouts and will be discussed during our first lab. Copies of previous audits done for this project will be available on Blackboard. The **data** we will download and analyze **are** available online via the USEPA (Environmental Protection Agency) at www.epa.gov/triexplorer. We will be looking at “Form-R” **Toxic Release Inventory (TRI)** waste generation reports required under Section 313 of the Superfund Amendments and Reauthorization Act of 1986 (SARA). Please pay particular attention to the deadlines for various portions of this project. Most of the requisite information required on the epidemiological and environmental health impact of the chemicals audited will be available on-line through various federal, state, and non-profit hosted web sites. **Information for the waste audit is available through a separate TRI/Writing manual, the content of which you are responsible for.** Both the syllabus and manual will be handed out in class and made available on Blackboard.

Teaching and Project Assistants: We’re here to help you with the toxic waste reports and to interpret Form Rs via the EPA and RTK-NET systems. Contact on any one of us.

Angelo Lan	lanj@dickinson.edu	240-3770
-------------------	---------------------------	-----------------

Randy Pajovich	pajovic@dickinson.edu	240-3655
-----------------------	------------------------------	-----------------

Brendan Young	youngb@dickinson.edu	240-3231
----------------------	-----------------------------	-----------------

In addition the TAs for ES 130 can assist with the TRI project:

Nicole Boucher	bouchern@dickinson.edu	240-3348
----------------	------------------------	----------

Evan Kendall	kendalle@dickinson.edu	254-8667
--------------	------------------------	----------

Breanna Marr	marrb@dickinson.edu	240-3353
--------------	---------------------	----------

Kristin Meseck	meseckk@dickinson.edu	240-3631
----------------	-----------------------	----------

Course Summary: Environmental Science 132 is designed as an introductory course both for students planning to major in environmental studies/science and/or those with prior training in environmental science through ES 131 and/or APES who wish to explore the human-modified context wherein basic environmental processes operate. Lab exercises and the TRI waste audit project involve quantitative and qualitative reasoning in support of further course work in the discipline.

This semester we will address three major themes in environmental science. All are areas where application of the natural science principles, first introduced in ES 131 or APES, provide the basis for actual policy, regulation, and management. For the first quarter of the semester we will examine the environmental and social relationships between **human populations and their agricultural resource base** within the context of the so-called “Third-World Population/Food Crisis.” As such, contemporary neo-Malthusian interpretations of overpopulation and resource scarcity will be considered, and a critique offered, focusing on the social and biophysical contexts wherein people make family planning and resource allocation decisions. Specific attention will be given to calculating population demographics and understanding the environmental impact of “North-South” (i.e., First World-Third World) resource exchange.

During the middle half of the semester we will focus on the leading anthropogenic (human-caused) contributor to global climate modification, namely **energy procurement and use**. Here we will consider the basic laws of thermodynamics and how they inform our understanding of the environmental impact of fossil, nuclear, and renewable sources of energy.

For the last quarter we will cover environmental disruption and management in contemporary industrial nations, with a primary emphasis on the United States. Following up on our TRI audits (see above), the focus will be on

the **human health impact of pollution** (environmental epidemiology), particularly as associated with solid and hazardous waste disposal and (mis)management. We will approach environmental epidemiology from two angles: (a) Environmental Science (e.g., the chemical and physical nature of environmental toxins; the biological (human and environmental) health effects of pollution; and the physics, chemistry, and geology of waste management); and (b) Regulation--specifically the scientific basis for policy decisions such as through use of dose-response curves and quantitative risk assessment to set exposure standards for carcinogens and toxins acting as endocrine-disrupters.

Labs: Due to the difficulties associated with winter sampling, the lab exercises this semester will be field-trip oriented, with the hands-on experience coming largely through the solar and biodiesel labs as well as the TRI project. Field trips are fun if you are dressed correctly. If we are going to be outdoors, wear comfortable and warm old clothes that you can get dirty. **You should wear layers for warmth and always wear gloves and hats. We will go snow, rain, or shine, so bring rain and snow gear if necessary.** Dressing appropriately is the difference between being miserable for 3+ hours or being comfortable and learning exciting new things. You are responsible to be fully aware where we are going before the lab, so that you can dress appropriately. Be ready for outdoor winter weather (below freezing with snow on the ground) and the dust and dirt present at the industrial sites we will be visiting. Closed-toe shoes or boots, rather than sneakers, are the required footwear. **Shorts and flip-flops are not allowed on field trips, even when warm outside.** On occasion we will be returning later from extended field trips. These dates are listed in the schedule so that you can plan accordingly.

All sports and extra-curricular conflicts with extended field trips on February 23 (5:30PM) and April 6 (7:00 PM) must be cleared in advance by the second week of classes. For each field-trip lab, you are to come prepared with at least two "rich" typed and printed questions prepared in advance and demonstrating familiarity with assigned readings and lectures. These will serve as a basis for your verbal participation on the trips and will be collected and recorded (4 percent of final grade). **Attendance is required for all labs and exams. A signed medical excuse is required if you miss an exam or lab.**

Other Policies:

- **Students are responsible for the material covered in this syllabus, including all due dates, required assignments, submission instructions, lab preparation, etc.**
- **You are expected to keep a backup copy of any document prepared for the course.**
- In addition, students are responsible for keeping all graded work until course grades are posted at the end of the semester.
- Attendance is expected at all course meetings, and students who miss meetings are responsible for what they missed. Lab attendance is required.
- Late work will be accepted for full credit only if it is accompanied by a medical excuse or confirmation of a family emergency from your advisor or an administrator. **Five points will be deducted for every day that an assignment is late.**
- All written work must be typed and double-spaced, with your full name clearly shown on the first page. **This will be submitted digitally** (via Blackboard or email as noted).
- It is expected that students will check email regularly, as course information will often be conveyed via email. Please be sure that you have sufficient space to receive messages.
- Policies on academic conduct and plagiarism described in the Dickinson Student Handbook pertain.
- Students with documented disabilities should discuss appropriate accommodations with the instructor during the first three weeks of classes.
- **As writing in the sciences is an important component for training in this course, you are required to study the Citation Format and Writing Tips addendum of the**

TRI manual. Pay particular attention to common word use mistakes, punctuation, and citations.

Web Sites for the TRI Audit Project and Supplemental Course Resources

A. Reference Guides (for styles and citations to use for your project papers)

<http://www.chicagomanualofstyle.org/home.html>: *The Chicago Manual of Style* Online
http://lis.dickinson.edu/Library/lp_find_info.html: Doing Research (Sphar Library website)
<http://lis.dickinson.edu/Library/Research/CitingRes/index.htm>: Library citation format page

B. Toxic Release Inventory Access Sites:

<http://www.epa.gov/tri/>: EPA's main page for the TRI data system and report
<http://www.epa.gov/triexplorer/>: USEPA direct access to TRI database--exportable to Excel
<http://www.rtknet.org>: The Right-to-Know Network--for TRI data, compliance data, etc.
<http://www.scorecard.org>: Environmental Defense--easily accessible database on right-to-know (TRI) and a whole lot more--just type in location

C. USEPA web sites (for supplemental information for your audits):

<http://www.epa.gov>: EPA's home page
<http://www.epa.gov/tri/tridata>: EPA's main page for TRI interpretation materials
http://www.epa.gov/enviro/index_java.html: EPA's main link to its numerous databases--some available in GIS format--useful for understanding exposure to TRI chemicals
<http://www.epa.gov/enviro/ej>: The Environmental Justice Geographic Assessment Tool of the EPA--useful for demographic and environmental impact assessment for your project sites (in GIS format)
<http://www.epa.gov/region03/>: The local EPA Region 3 home page
<http://www.epa.gov/echo>: The fed/state compliance record for over 800,000 facilities
<http://www.epa.gov/oppt/rsei/>: Risk-Screening Environmental Indicators (for TRI chemicals)

D. Impact of corporations on the environment (for background info. of corporate polluters):

<http://www.essential.org/monitor>: *The Multinational Monitor*--Corporate crimes
<http://www.corpwatch.org>: Corporate Watch--to track company crimes and misdemeanors
<http://www.americanchemistry.com/>: American Chemistry Council--main interest group for US chemical industry
<http://www.movementech.org/gis/demoanalysis.htm>: Website for GIS-Linked Environmental Justice investigations
<http://www.gcmonitor.org>: Global Community Monitor

E. Environmental Action and Justice for Louisiana and Pennsylvania (state, regional, community)--(to locate communities and facilities to audit)

<http://www.ejrc.cau.edu>: Environmental Justice Resource Center at Clark Atlanta University
<http://www.leanweb.org/>: Louisiana Environmental Network
<http://www.labucketbrigade.org>: Louisiana Bucket Brigade
<http://www.cleanairboard.org/>: The Clean Air Board of Central Pennsylvania
<http://www.lowerusquehannariverkeeper.org/>: Look at the research requests from the Lower Susquehanna Riverkeeper
<http://www.gasp-pgh.org/>: Group Against Smog and Pollution (Pittsburgh)

<http://www.PennEnvironment.org>: PennEnvironment--a coalition of local environmental groups.

A good source on national policy and state response

<http://www.actionpa.org>: PA ACTION Center--to train local activists (including students)

<http://www.energyjustice.net/>: PA Energy Justice Network(linked with PA Action)

<http://www.celdf.org>: Community Environmental Legal Defense Fund--the local chapter works with communities on environmental health and justice

<http://www.pennfuture.org>: Penn Future-- focused on energy and other pressing environmental issues. Based in Harrisburg--excellent internship site for qualified students

<http://www.dep.state.pa.us>: PA Dept. of Environmental Protection--a central source for on-line data and articles on environmental issues in PA

<http://www.seac.org>: The Student Environmental Action Coalition (national)

F. Environmental News (to keep up with breaking environmental news):

<http://www.grist.org/>: Grist Magazine--an on-line compilation of breaking environmental news from national and international source

<http://www.alternet.org> Alternet--on-line news from the alternative press re. current affairs

<http://www.rachel.org>: excellent archive of 1,000 issues on environmental science and regulation. Many articles used in class come from this public-access site.

<http://www.envirolink.org>: for almost everything else--one of the largest env. web sites

<http://www.ewg.org>: Environmental Working Group access to major env. issues as well as data on line

<http://www.webdirectory.com>: a major environmental search engine

<http://environment.miningco.com/mlibrary.htm>: links to dozens of useful sites

G. Environmental Health Web Sites (with news and analysis)

<http://www.environmentalhealthnews.org>: Breaking environmental health news

<http://www.ehponline.org/>: *Environmental Health Perspectives*, an open-access journal

<http://www.ourstolenfuture.org>: Put out by the authors of *Our Stolen Future*

<http://www.chej.org/>: The Center for Health, Environment, and Justice--Lois Gibb's national outreach organization

<http://www.protectingourhealth.org>: Peer-reviewed environmental health information from the Collaborative on Health and the Environment

Co-Curricular Reports

Environmental education does not occur solely in the lecture hall or laboratory. It is an ongoing process whereby each of us is continuously being shaped by, and in turn shapes, the environment around us (be this intellectual and/or physical). The College offers a variety of opportunities whereby the campus community can become active learners, broadening, and contributing to, environmental knowledge. These include department seminars (e.g., through Earth Issues sponsored by the ES Department or with the Geology and Biology Departments' seminar series), special Clark Forum presentations by visiting scholars, Common Hour events, etc.

In addition, there are a number of opportunities to learn more about some of the major themes we will be discussing this semester. They are sponsored by groups such as the Pennsylvania Sustainable Agriculture Conference held at Penn State (PASA--Feb. 4-6), and the Center for Environmental and Sustainability Education (CESE) with its Sustainability Conference on campus April 15-17. Should you decide to participate in one of these all-day events, it can count double, that is it can count as fulfilling the requirement for both co-curricular reports. Transportation to PASA may be arranged through the College Farm. ES 132 students will be added to the email list for the **Center for**

Environmental and Sustainability Weekly News Update--prepared by Sara Brylinksy (CESE) with input from Vallie Edenbo (ES lab technician and program coordinator)--and with full coverage of campus and off-campus events qualifying for co-curricular status.

To encourage your participation in these co-curricular events, and to expand your horizon beyond the classroom walls, six percent of your grade for ES 132 will be based on your attendance at, and preparation of a brief typed report for **two events** that are related to environmental themes. These need not be the same themes that we cover in class this semester, just as long as they deal with some aspect of the natural environment and/or human modification of that environment. Insofar as environmental affairs cross-disciplinary boundaries, social science and even humanities departments might well sponsor these events.

The co-curricular events that you report on cannot be events that you are required to attend for this course or for any other course.

The two-page (minimum) double-spaced submission must include:

1. The important identifying information for the event: This normally includes the event's title; sponsor; name of the presenter(s) and organization they represent; and the date, time, and location of the event.
2. A concise summary of the event: This is more than just a list of details or a description of activity. Rather, a good summary should explain the context wherein the presenter works, the point-of-view and/or research results presented, the conclusions reached, any dissent from the prevailing view, etc.
3. Finally, please explain the relevance of the event to environmental study and provide your thoughtful response to the event's content and to the presenter's viewpoint or conclusions. This may include, and is not limited to, your opinion on the value of the event, your critique of the content covered, your understanding of the presenter's point of view and what might be motivating him or her, etc.

Your report should be concise and dense with information. Try to focus on the content rather than the style of the presentation, again paying particular attention to environmental science and/or other forms of environmental understanding. Please pay particular attention to style, grammar, punctuation, and exposition.

For two of the co-curricular events that you attend, you must **within ONE week of the event submit a two-page (minimum), double-spaced report**. On top clearly indicate your name, the title of the report, and whether this is your first or second required co-curricular report for the class this semester. With a proper initial identifying paragraph, a formal citation system is not necessary. Early semester submission is encouraged.

Submit the report as an attachment to heiman@dickinson.edu via email. The tag line of the attachment should read: Last name Co 1 (or 2).

THE FIRST REPORT IS DUE BY 5:00 PM MARCH 12. THE SECOND REPORT IS DUE BY 5:00 PM APRIL 30. No reports will be accepted after 5:00 PM on these dates.

Plan ahead and do not leave this assignment to the due date as you have exams and the TRI project also due around then.

College Statement on Accommodations for Disabilities

In compliance with the Dickinson College policy and equal access laws, I am available to discuss requests made by students with disabilities for academic accommodations. Such requests must be verified in advance by the Coordinator of Disability Services who will provide a signed copy of an accommodation letter, which must be presented to me prior to any accommodations being offered. Requests for academic accommodations should be made during the first three weeks of the semester (except for unusual circumstances) so that timely and appropriate arrangements can be made.

Students requesting accommodations are required to register with Disability Services, located in Academic Advising, first floor of Biddle House. Please contact Marni Jones, Coordinator of Disability Services (at ext. 1080 or jonesmar@dickinson.edu) to verify eligibility for reasonable and appropriate accommodations.

Academic Honesty Policy

Students are expected to uphold the Community Standards and Procedures for Academic Conduct (beginning on page 3 of the pamphlet Dickinson College Community Standards Available: <http://www.dickinson.edu/student-life/resources/dean-of-students/content/Resources-for-Students/> These standards consider the following acts to be academic dishonesty: plagiarism, allowing another student to copy your work or your ideas, submitting work previously used in another class without informing the instructor, and/or tampering with the work of others.

Lecture, Labs, and Reading Assignments:

Note: As class lectures this semester will be closely linked with assigned readings, **all readings must be completed by the day of the scheduled lecture** in order to support participation and comprehension. One copy of the assigned text will be available at Spahr Library. Any class handouts are to be treated as required class readings. Don't forget to look also at the CD-ROM and web sites that accompany the text. The CD-ROM (in particular) supplements assigned readings. **Periodically readings on breaking environmental issues will be posted to Blackboard. You are responsible for checking Blackboard "Readings" to see what has been added. Some of the readings marked "review" cover prerequisite material from ES 131 and APES that you are responsible for.**

Escape Clause: The syllabus is a "work in progress" as I may have to move scheduled lab trips and assignments around due to weather conditions and the availability of our tour guides. You are responsible for keeping up with schedule changes announced in class and posted through Blackboard.

Recommended Videos Supplementing Class Material

Eight award-winning DVDs have been placed on reserve at the library to provide background information with stunning visuals on major issues we will be covering this semester. Please note that several will be screened during lecture or lab periods.

- a. *An Inconvenient Truth* (Al Gore's Academy-award winning film on global warming and essential back-ground information for this course)
- b. *The 11th Hour* (Fine follow up on what needs to be done re. global warming)

- c. *Razing Appalachia* (On the devastation caused by mountaintop removal for coal)
- d. *Burning the Future* (West Virginia victims of mountaintop removal state their case)
- e. *Coal Country* (Recent video on mountaintop removal in West Virginia)
- f. *Fenceline* (Grassroots environmental activism in Louisiana's infamous "Cancer Alley")
- g. *Blue Vinyl* (On the impact of polyvinyl chloride production for house siding)
- h. *The End of Suburbia: Oil Depletion and the Collapse of the American Dream*

Assignments Based on 13th Edition of Miller (M) Environmental Science Text

1/26 (T): Introduction: Science, Environmental Science, and the Dialectics of Pollution

M Chapter 1 (background on environmental science and sustainability)

M Chapter 2 pp. 23-28 (on the scientific method of knowing)

Catch up on this background material by the end of the first week

Recommended: M pp. 1-4 (How to be an engaged, successful science student)

Lab: Video: *We All Live Downstream*

Introduction to TRI Project

1/28 (Th): Basic Demographics

M Chapter 6 pp. 94-107

M p. 65 bottom (on humans as a dominant species)

2/2 (T): The Family Size Decision in the Context of "The Tragedy" of the Commons

Blackboard Readings on "The Tragedy of the Commons"

Lab: Demographic Exercises, Video: *China's Only Child*

Bring Miller (text) to class for map interpretation exercise

2/2 (T): Professor Carl Kirby (Bucknell University) on the Environmental Impact of Marcellus Shale Natural Gas Extraction in PA. Hub Side Rooms, at noon.

2/4 (Th): Traditional Agricultural Systems and the Green Revolution

M pp. 206-218

M S1, S2, S3, and S4: Supplements on measurement, graphing, and maps

2/9 (T): The Green Revolution, Tropical Deforestation, and the Biological Carbon Cycle

M Chapter 3 (background review on energy and matter flow in ecosystems)

M pp. 122-127 (on global climate and greenhouse gases)

M pp. 133-138, 178-190 (on temperate and tropical forests and deforestation)

TRI Project Proposal and chemical list due in lab. Resubmit after lab by email to lab instructor.

Lab: TRI Data Collection and Analysis, GIS demonstration, Individual Consultations

2/11 (Th): Pests, Pesticides, and Sustainable Agriculture

M pp. 221-227 (on pesticides and sustainable agriculture)

2/16 (T): Global Farms and Global Supermarkets

M pp. 218-221 and 227-237 (on industrial agriculture, GMOs, and food security)

M pp. 198-203 (on global fisheries)

Lab: Agriculture Simulation Game

2/18 (Th): Natural Hazards: Act of G-d or Acts of Humans?

M pp. 273-280 (review geologic processes and hazards)
M pp. 254-256 (on flooding)
M S 8 (on weather, tornadoes, and cyclones)
Blackboard Readings on "natural" disasters

2/23 (T): Exam 1

Lab: Mason Dixon Dairy Farm (**back by 5:30 PM**)
Blackboard Readings on methane capture from animal waste-due for lab.

2/24 (Wednesday): Dallas Burtraw: Senior Fellow, Resources for the Future, campus lecture on: **U.S. Climate Policy--The Next Steps**. Stern Center 7 PM.

2/25 (Th): Energy Principles and Thermodynamics

M pp. 28-37 (on matter and energy)
M S6 (Supplement review of basic environmental chemistry)

3/1: (M): Data Analysis Section of Audit due Blackboard digital dropbox by 5 PM

3/2 (T): Energy and the Environment: Procurement, Use, and Waste Disposal

M pp. 282-286 (on mining)
M pp. 368-376 (ES 131/ APES review on air pollution--which pollutants are linked to the burning of fossil fuels?)
M pp. 376-382(ES 131/APES review of air pollution and market-based regulation)
M S9 (Supplement on energy maps and data)

Lab: Simultaneous Videos:

An Inconvenient Truth by Al Gore (for those who have not seen it already)
The 11th Hour (narrated by Leonardo Dicaprio) for those who already saw above
Followed by class discussion on the science of global warming.

3/4 (Th): Global Climate Change

M pp. 382-402 (including ES 131/APES review on ozone depletion)
Blackboard articles on scientists as professional skeptics

3/9 (T): The Oxymoron of Clean Coal/ Principles of Energy Efficiency

M pp. 305-309 (on coal)
M p. 394 (on carbon capture and storage)
Blackboard Readings on coal mining
M pp. 317-319 and 321-326 (on energy conservation and efficiency-for lab)

Lab: Energy Efficiency and Outdoor Tour of Energy Efficient Home

3/11 (Th): Fossil Fuels: Oil, Natural Gas, and the Marcellus Shale Formation

M pp. 296-305
Blackboard Readings on Marcellus Shale gas extraction

3/16 (T): Spring Break

3/18 (Th): Spring Break

3/23 (T): Renewable Energy: Solar and Wind Power (Guest Lecture by Matt Steiman)

Meet in 110 Dana Hall for lecture today

M pp. 326-329 (on solar power)

M pp. 330-331 on wind power)

Blackboard Readings for solar lab preparation

Lab: Solar Energy for Dickinson College--A Hands-On Demonstration by Vallie Edenbo and Matt Steiman

3/25 (Th): Renewable Energy: Hydro, Geothermal, and Biomass Power

M pp. 245-246 (on large dams and hydropower)

M pp. 329-330 (on hydropower)

M p. 332 (on biomass power)

M pp. 335-336 (on geothermal power)

3/30 (T):Hydrogen, Ethanol, and the Quest for Alternative Transportation Fuels

Meet in 110 Dana Hall for lecture today

M pp. 319-321 (on transportation efficiency and new vehicles)

M pp. 332-335 (on alternative fuels)

M pp. 336-337 (on hydrogen as a transportation fuel)

M pp.338-343 (on transitioning to a sustainable energy future)

Blackboard Readings on alternative transportation fuels

Lab: Biodiesel preparation lab led by Bill Shoemaker (Facilities Management)

4/1 (Th): Exam #2

4/5 (M): Complete TRI Project Report Due Today Via Digital Dropbox on Blackboard

4/6 (T): Nuclear Power and Waste Management

M pp. 309-317

Blackboard Readings on Three Mile Island disaster

Lab: The Anthracite Coal Region of PA: The Pioneer Mine Tour and the Centralia Mine Fire. **Leave at 12 noon (sharp)-grab a big lunch to go at the HUB**
Return by 7 PM (dinner when you return)

4/8 (Th): Cancer as an Environmental Disease

M pp. 344-346 (on health hazards and risk assessment)

M pp. 352-367 (on cancer, endocrine disruption, and the precautionary principle)

Blackboard Readings on carcinogen detection and cancer clusters

4/13 (T): Endocrine Disruption and Dose-Response Curves: The Science behind Risk Assessment

Blackboard Readings on chlorinated hydrocarbons acting as xenoendocrines and "Our Stolen Future"

Lab: Video: *Blue Vinyl* and follow up short--or *Assault on the Male* (Nova)

Discussion on the proposed phase out for chlorinated hydrocarbons

4/15 (Th): Guest Lecture on Environmental Health

Readings to be assigned

4/19 (M): Complete TRI Audit Report due by 5 PM using Blackboard digital drop box.

4/20 (T) Solid Waste Generation and Landfills

M pp. 403-408

Lab: Cumberland County Landfill

4/22 (Th) (Earthday): Solid Waste: Incineration, Recycling, and Source Reduction

M pp. 409-415

Blackboard Readings on solid waste (mis)management

4/27 (T): Hazardous Waste: Production and Disposal

M pp. 415-423

Lab: Work-Study at the College Farm. Wear clothes to get dirty in and bring a pair of work gloves in you have them.

4/29 (Th : Abandoned Toxic Waste, Love Canal, and the Superfund Act

Blackboard Readings on Love Canal and Superfund sites

5/4 (T): The Inconvenient Truth Behind Global Carbon Trading

Blackboard Readings

LAB: TRI Presentations (Plan on 5 minutes/student)

5/6 (Th): Pollution and the Mode of Production

Blackboard Readings on capitalism and the environment

M Recommended (not required) Chapter 17 (on environmental economics and policy)

5/7 (F): Final corrected TRI project due May 1 (May Day) by 5 PM (via digital drop box)