ENTS 100: Science, Technology, and Public Policy **Carleton College**
Section 00 **GENERAL INFORMATION (Syllabus)** **Spring 2003**

Instructors (i.e. who to throw your rotten vegetables at)

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Office hours: Consult http://www.acad.carleton.edu/curricular/CHEM/faculty/rrossi/OfficeSchedule.pdf, or, if those times don't work, please make an appointment with me by email (preferred) or phone.

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Office hours: The hour after class, MWF, unless I have to go to comps or a departmental meeting. I am also happy to make an appointment with you at any mutually agreeable time. Please contact me via phone or email.

Course Description

Science and technology have had profound effects on public life over the past century. As these developments affect all of us, it is important that we, as citizens, learn how to assess their benefits and costs. The purpose of this course is to engage us in these issues. No special expertise is assumed – we will see to it that an intelligent and thoughtful person, regardless of their technical background, can meaningfully weigh these matters after studying the basics. We will focus on three particular topics this term, in the following order:

I. Nuclear and other weapons of mass destruction
II. Genetics
III. Energy and Transportation

This course is a first-year seminar. It is intended to be a liberal arts course in the finest sense of the term. Our small class size and discussion format are meant to encourage your active participation in learning, both inside and outside of class. There will be a variety of activities designed to elicit your active participation. ***This class will not be a spectator sport!*** *What you get out of it will scale exponentially with what you put into it!*

ENTS Credit

ENTS 100 *does* count toward the total of six courses required to obtain an ENTS concentration. However, it does *not* count as one of the project-based ENTS "entry" courses, and it does *not* satisfy one of the four ENTS distribution categories that must be covered in pursuit of the required six-course total.

Class Meeting Times

ENTS 100 meets Mondays, Wednesdays, and Fridays during period 5a (MW 1:50-3:00, F 2:20-3:20) in Olin 101. Note that a prep sheet will be required for each day's class, and that if you miss a day you should prepare a prep sheet for the day you missed. (See the section on Prep Sheets, in this syllabus, for complete details.)

Electronic Resources

We have set up a web page for this course, mostly to provide a convenient place for you to find links and an archive of the reading assignments. This will save us from writing and you from copying down long, nasty URL's. Unfortunately, we will still have to give you and you will have to type in *this* long, nasty URL:

http://www.acad.carleton.edu/curricular/CHEM/courses/rrossi/ENTS100_S03/

You can also access the ENTS 100 webpage via the Carleton homepage, through the ENTS department:

(Academic Departments : ENTS : Courses : ENTS 100) [This is the easy way if you can't bookmark it!]

Required Texts

The following books and packets are required. It will be assumed you have ready access to each of them:

- *Brighter than a Thousand Suns: A Personal History of the Atomic Scientists.* Robert Jungk. Harvest Books: 1970. ISBN: 0156141507
- *The New Nuclear Danger: George W. Bush's Military-Industrial Complex.* Helen Caldicott. New Press (Distributed by W.W. Norton): 2002. ISBN: 1565847407
- *Germs: Biological Weapons and America's Secret War*. Judith Miller, Stephen Engelberg, and William Broad. Simon & Schuster: 2001. ISBN: 0684871599
- *What it Means to be 98% Chimpanzee: Apes, People, and Their Genes*. Jonathan Marks. University of California Press: 2002. ISBN: 0520226151
- *Genetic Dilemmas: Reproductive Technology, Parental Choices, and Children's Futures*. Dena Davis. Routledge: 2001. ISBN: 041592409X
- *The Consumer's Guide to Effective Environmental Choices: Practical Advice from the Union of Concerned Scientists.* Michael Brower and Warren Leon. Three Rivers Press: 1999, 2002. ISBN: 060980281X
- A packet of shorter readings, which is available in the Carleton bookstore.

There will be some additional readings, in the form of handouts and online documents, that we'll give you closer to the time that they will be needed. Some of these will be tied to visiting speakers and case studies.

Course Requirements

This class is graded S/CR/NC (i.e., Satisfactory, CRedit, or No Credit). To receive an S, your major task will be to carefully and critically read the assigned material, to bring a "prep sheet" to class each day to assist us in our discussions and questions, and to arrive in class prepared to and enthusiastic about jump(ing) into a discussion of the material. Since this is not a lecture course, your active participation in the course is critical to its success! (See below for more details on the discussion format we will use at most class meetings.) There will be a midterm project (on topics I and/or II), a project or debate on topic III, and a final project, to be done outside of class, which must also all be satisfactorily completed in order for you to receive an S. There will be some additional out-of-class requirements, such as viewing some movies, and attending the May 23 convocation.

We recognize that some people have more difficulty speaking in public settings than others do. We plan to offer a variety of activities, involving groups of varying sizes, so that at least some of them will be relatively painless for everyone. Feel free to discuss privately with either or both of us any difficulties that you may be having with respect to getting involved in the conversation.

Just as it is important for each of us to participate actively in class, it is also critical that we respect one another. This means listening carefully to what others have to say, separating their ideas from their personhood, and not dominating conversation. If you ever feel that you have not received the respect of a colleague (including either of the class clowns, er, instructors) in class, we hope that you will let the offending person know in a respectful manner that suits you, either in or outside of class. Either of us would be willing to provide a neutral ground for this discussion, if desired.

Class Discussion Format and Preparation

For each class, you will be expected to do a careful and critical reading of the material, and you will also be expected to bring a "prep sheet." In class, you should be a full participant in the discussion, while not dominating it. Members of the class have the primary responsibility for posing questions, suggesting and assessing solutions, and discussing the material. You also have responsibility for keeping the discussion on track, and on time. This includes suggesting that it is time to move on!

Discussion Format

Here is a description of the rather structured format for our discussions, with props to Professor Bill Titus:

1. Identification of today's subtopics – One class member should write these on the board before class begins. Today's assignment's chapter and/or section headings could be a good beginning.
2. Allocation of time – At the beginning of class, the class decides together (and the above class member records on the board) the amount of time to spend on each subtopic, leaving the last five minutes for items 4-6 below.
3. Posing and discussion of questions associated with each subtopic – This is where we will spend the bulk of our class time.
4. General summary statement and overview of the important material covered today
5. Integration and application of the material to other areas of human inquiry
6. Evaluation of the group

To help with item 6, here are some

CRITERIA FOR A GOOD DISCUSSION GROUP

Prevalence of a warm, accepting, non-threatening group climate.
Learning is approached as a cooperative enterprise.
Learning is accepted as the main reason for the group meetings.
Everyone participates and interacts.
Leadership functions are distributed.
Group sessions and the learning tasks are enjoyable.
The material is adequately and efficiently covered.
Evaluation is accepted as an integral part of the group's operation.
Members attend regularly and come prepared.

If you are having trouble getting involved in our conversations, (or stopping short of dominating the conversations, for that matter,) you might want to pick one of these roles, and try to focus on it for a day. Once you've mastered one, move on to a different one! Most people are better at some of these than they are at others, but they are all useful and they are all good skills to develop!

GROUP ROLES AND MEMBER SKILLS

Initiating
Giving and asking for information
Giving and asking for reactions
Restating and giving examples
Confronting and reality testing
Clarifying end summarizing
Timekeeping
Evaluating and diagnosing
Standard setting
Group tension relieving
Sponsoring and encouraging

Prep Sheet Format

Here is an outline for your daily prep sheet, which is also modeled after Professor Bill Titus' format. A decent prep sheet will be about two handwritten pages.

1. Identify the subtopics in the reading assignment. The chapter and/or section headings are acceptable subtopics, in most cases.
2. Write a brief statement on the subject matter for each subtopic. This should reflect your opinion in some way, either on what the author has said, or based on your own knowledge or research.
3. Under each subtopic, write all the questions that come to mind on the material relevant to that subtopic. Try to include a minimum of one question for each subtopic. Write out the questions in full, as you would say them aloud to your peers, so that it is easier for you to state them in class.
4. Write out your version of a general statement of the material covered; your statement should emphasize what you consider to be the most important point(s).
5. Spend about ten minutes writing on a broad or integrative question related to the reading. This writing should be on a topic *related* to the day's reading, but not a core dump of what you just read, or more of the same stuff you just wrote. What *else* does this reading get you thinking about? Do you see a connection between it and something else of relevance to you? Can you go *beyond* what you read?

Note: Please do not come to class if you have not done your reading and fully completed your prep sheet, as you will be wasting our time and yours. If you must miss a class, bring to the next class you attend the prep sheet for the current class (check with classmates or online for the assignment) plus a prep sheet for the class you missed. The prep sheet for the missed class should include an expanded "Integration" (item 5), at least one typed page in length.

Approximate Course Schedule

I. Nuclear and other Weapons of Mass Destruction (the weeks of 3/31, 4/7, and 4/14)

- The history of atomic (fission) and hydrogen (fusion) bombs through the mid-1950s.
- Modern developments in weapons of mass destruction
- Human radiation risks and the ethics of human experiments (see also Prof. Kahn's visit on April 28, below)

II. Genetics (the weeks of 4/21, 4/28, plus W 5/7, F 5/9, and M 5/12)

- Background information on genetics
- Current issues in stem cell research, genetic manipulation, and cloning

Visiting speakers:

Professor Jeffrey Kahn, Director of the Center for Bioethics at the University of Minnesota, will speak on the ethics of human radiation experiments in class on Mon., April 28. To prepare for class that day, you should read the executive summary of

The *Final Report* of the **President's Advisory Committee on Human Radiation Experiments.** The executive summary is available online at http://tis.eh.doe.gov/ohre/roadmap/achre/summary.html

Prof. Ron Green of Dartmouth College and Prof. Rebecca Dresser of Washington University will present Convo on Friday, May 23 (at which your attendance is required) and will come to class that day to discuss the ethics of stem cell research and cloning.

To prepare, please read the executive summary of **The President's Council on Bioethics 2002** report, *Human Cloning and Human Dignity: An Ethical Inquiry*. It's online at http://www.bioethics.gov/reports/cloningreport/execsummary.html

III. Energy and Transportation (W 5/14, F 5/16, the weeks of 5/19 and 5/26, M 6/2, and W 6/4)

- A case study of octane rating boosters in motor fuels, yesterday and today
- Transportation: What "should" the future look like, and what is the *likely* transportation future?
- Historical case studies on ozone-depleting chemical regulations and/or emissions trading
- Energy: What "should" the future look like, and what is the *likely* energy future?
  - What is the "Greenhouse Effect?"
  - What do various countries do to get their energy, and how much do they use?
  - "Globalizable" energy solutions?
  - We are burning fossil fuels faster than they are being re-formed. We'll eventually have to change what we are doing. How late is too late to change? How early is a waste of resources?