EPD 690: Seminar in Nanotechnology and Society
*Analytical and Pedagogical Approaches*

**Instructors:**
Clark Miller, Science and Technology Studies  
Wendy Crone, Engineering Physics  
Karin Ellison, Graduate School  
Greta Zenner, Materials Research Science and Engineering Center

**Course Credit:** 1 or 3 credits (see below)

EPD 690 (Section 48)  
Class Number: 63535  
Tuesdays, 5:00-6:00 pm (5-7 p.m. for 3 credit option)  
Location: 514 Engineering Research Building

**Course Objectives:**

In recent years, nanotechnology has emerged as an exciting new arena of scientific research and technological innovation. At the same time, important questions have arisen about the technology's potential social, ethical, and environmental implications by prominent technology leaders, nanotechnology boosters, science fiction authors, policy officials, and environmental organizations. This seminar will offer an opportunity for graduate students from across campus, including the natural and social sciences, humanities, and engineering, to explore these questions and reflect on the broader place of technology in modern societies. No special prerequisites are required.

The seminar will be available for either 1 or 3 credits. Students who opt for the 1-credit option will be expected to attend the seminar's first hour, read and discuss class materials, and write a one-page response essay each week. This part of the seminar will focus on theories and approaches to understanding the social dimensions of technology, applied to the case study of nanotechnology.

Students who opt for the 3-credit option will also be expected to attend the seminar's second hour (to follow immediately after the first) and to develop over the course of the semester an annotated syllabus and teaching materials for an undergraduate seminar in nanotechnology and society. This latter part of the seminar is intended to provide graduate students with approaches, materials, and skills for teaching undergraduates how to think critically about the social aspects of technology. It is intended that these will be of value to future educators who want to teach such topics, either as stand alone courses or as part of another course.

Contact Prof. Clark Miller, Miller@Lafollette.wisc.edu, with questions. Other contact information: Wendy Crone (crone@engr.wisc.edu); Greta Zenner (gmzenner@wisc.edu); Karin Ellison (kellison@bascom.wisc.edu). Office hours will be by appointment.
Grading for the 1-credit course will be determined on the basis of two factors:

- **50% Participation:** Students will be expected to attend each class session, unless an absence is discussed with Prof. Miller prior to class, and to contribute to classroom discussions in each session.
- **50% Reading Responses:** Students are required to submit a one-page, single-spaced response essay to each week’s readings. These essays are due on the course website on Sunday evening.

Further details regarding requirements and materials for the 3-credit version of the course can be found in a supplementary syllabus.

Course readings can be found on the course website:

http://courses.engr.wisc.edu/ecow/get/epd/690/crone/

The password is: nanosoc.

**Course Activities**

**Week 1: Course Introduction**

**Week 2: What is Nanotechnology? Why Do We Care about Its Societal Dimensions?**

- Langdon Winner, testimony to Congress.

**Week 3: What is Progress?**

- Leo Marx, “Does Improved Technology Mean Progress?”
- Classroom discussion: What does Marx’s argument imply about current discussions of the societal benefits of nanotechnology? Can we think of ways in which nanotechnology innovations might not necessarily contribute to progress?

**Week 4: Technologies as Forms of Life**

- Assignment: Find a news article describing an application of nanotechnology. Describe a form of life that might emerge involving this application, addressing who might see it as progressive and who might not.
Week 5: Social Choices and Technological Change
- Classroom discussion: Are there other examples that you can think of in which users are shaping current technologies? What does this mean for how we think about the societal aspects of nanoscience and nanotechnology?

Week 6: The Politics of Technological Change
- Classroom discussion: Is technology political? What does this apply for how we think about technological design?

Week 7: The Military and New Technologies
- “Soldier of the Future,” movie from the MIT Institute for Soldier Nanotechnologies.
- What is the relationship between the military and new technologies? What interests does the military have in nanotechnology?

Week 8: Technological Accidents
- What is a “normal accident”? Do Perow’s concerns apply to nanotechnology?

Week 9: Technology, Risk, and Society
- Why do experts and lay publics sometimes arrive at different reasoning regarding the risks of technologies?

Week 10: Nanotechnology Risks – Environment and Health Impacts
• How should we approach questions of environment and health risks associated with nanotechnology?

**Week 11: Nano-Critics**
- ETC Group, *The Big Down*.
- Greenpeace, *Future Technologies, Today’s Choices*
- What social groups care about nanotechnology? What reasons do they give for their concerns?

**Week 12: Government Assessments**

**Week 13: Science Fiction**
- Find and read at least one short story or at least part of a novel, or watch a science fiction movie or TV episode, dealing with futuristic nano-society. Examples include Michael Crichton’s *Prey* or Neil Stephenson’s *The Diamond Age* or at least a couple *Star Trek* episodes.
- Consider the advantages and disadvantages of science fiction as a medium for inquiring into and communicating about the societal aspects of nanotechnology.

**Week 14: Technology and the Future**
- Why is projecting out into the future of technologies so hard? How important is it to try anyway? If it’s important, how should we approach the uncertainties involved?