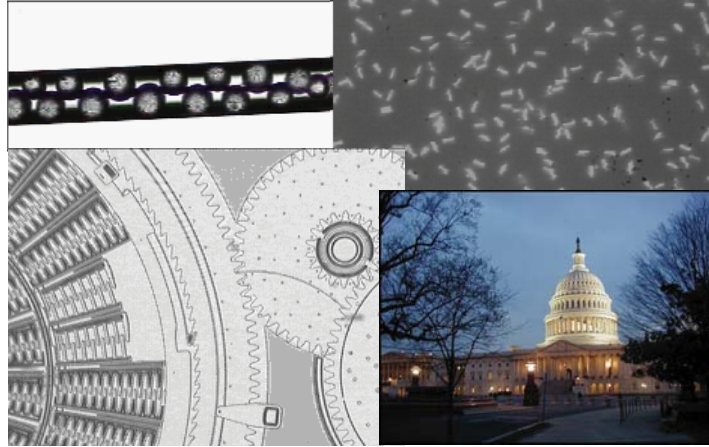


ME/STS497J Expanding View: Micro and Nanoscale Science and Engineering in the Larger World



3 credit
Tu Th 11:15-12:30PM
105 Willard Bldg
Schedule#:796237

Prof. Kendra Sharp
Department of Mechanical Engineering
157D Hammond Building
865-4292, kvs10@psu.edu

Course Description: Micro and Nanoscale Science and Engineering in the Larger World, a three-hour course, explores the social and political context surrounding the emerging area of micro and nanoscale science and engineering. Students will consider: the societal and ethical implications of research and development (R&D); the impact of public policy on both R&D infrastructure and R&D direction; the status of the U.S. R&D enterprise within an international context; and the media portrayal and public perception of science.

Teaching Staff: Prof. Kendra Sharp. Office Hours: Wed 2-3PM in 157D Hammond or by appt

Required Text Material: *Prey* by Michael Crichton; *The Dance of Molecules* by Ted Sargent; *Voodoo Science* by Robert Park. All are available used through Amazon for <\$10 (each). Please make every effort to order these soon as they will be used for class assignments. Additional readings will be distributed in class or posted on ANGEL.

Prerequisites: None.

Course Policies:

Course Participation/Preparation: In ME497J, you are expected come to class prepared, having completed the out-of-class assignments (readings, presentation preparation, written assignments, or independent research). Such preparation is required in order for the discussion and participation-based course format to be successful. You are also encouraged to present your own ideas and topics of interest during the course period or individually by email or discussion with Prof. Sharp, in order that the course content address both the

individual and group interests of those involved. The course does rely heavily on your participation, so regular attendance is expected.

Field Trip: We are tentatively planning a one-day field trip to Washington, D.C. to meet with “big-picture” science experts in April. We hope that everyone will be able to attend and will be discussing the date in class.

Grading:	Class project/presentation	50%
	Other assignments	40%
	Course participation	10%

Students will work together independently or in pairs on a class project and presentation on a specific topic. More details about presentation format and expectations will be provided in class, but students should be aware that this assignment is a key component of the course grade. Out-of-class assignments will be given approximately every week or every other week. If the assignment is to be turned in, please make every effort to get it in on time. Late HW will be accepted but with a 10% penalty per day late, including weekend days.

Attendance is expected. Your course participation grade is based on your professionalism and your attitude towards the course, which is directly reflected by class attendance, participation in in-class activities, and respect for fellow students, instructor(s), and other course support staff. Each student begins with the maximum course participation score (10%). Your course participation score may be docked for a pattern of unexplained absences, though certainly a couple (1-2) misses for random reasons is not unreasonable. For absences due to illness, family emergency, or university-excused absence, I strongly encourage you to contact me by email (kvs10@psu.edu) or phone 865-4292 prior to the absence if at all possible. Please do not abuse this policy.

While I do not expect it to be an issue in this small, discussion-based elective class, a generally apathetic or unprofessional attitude towards class or class-related activities may lead to a further reduction in course participation score.

Academic Integrity:

As per University Policy 49-20, "Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle. Consistent with this expectation, the University's Code of Conduct states that all students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts."

The College of Engineering (CoE) maintains a website on academic integrity at <http://www.engr.psu.edu/CurrentStudents/acadinteg.asp>. The CoE academic integrity website contains a link to precedent examples of academic integrity violations (second bullet point on website), which you are strongly urged to review. An academic integrity violation will be handled according to university policy, outlined on the College of Engineering Academic Integrity website.

Revised Schedule

<i>Week</i>	<i>Topic</i>	<i>Student Presentations (*)</i>
1, Jan 16-18	Course introduction, Introduction to Micro/Nano S&E; Intro to Micro/Nano S&E at Penn State	
2-3, Jan 23-25 Jan 30-Feb 1	Basic Civics Refresher, Science Policy (Congressional) Introduction. What goes on in Congress that affects the scientific community? Is it all about money and research funding? Legislative Process, Hands-on session on using databases and doing library/web research	
4, Feb 6-8	Nanohistory, Nanotools	
5, Feb 13-15	Intro to Ethical Constructs, Public Perception of Nano, Nanofab tour (? – date TBA)	
6, Feb 20-22	Aspects of Societal Impact of Micro/Nano S&E: Health, safety and the environment, human enhancement. Discussion of <i>Prey</i> .	
7-8, Feb 27-Mar 1, Mar 6-8	Legal and regulatory issues, Intro to Exec Branch. Student presentations (Mar 1, Mar 6), PSU Government Affairs Guest speaker (Mar 8)	*
9, Mar 20-22	International Context/Global competitiveness, Student Presentations (Mar 22)	*
10 Mar 27-29	Nano products, Evaluation of technology Student Presentations (Mar 29)	*
11 Apr 3-5	Nano at PSU, research opportunities, outreach, Discussion of <i>Voodoo Science</i>	
12-14 Apr 10-12, Apr 17-19, Apr 24-26	Guest lecturers, lab tours, field trip prep/field trip	
15 May 1-3	Nanotech in the movies; wrap-up	

Two ongoing out-of-class assignments:

1. In place of class on Jan 30: Sometime during the semester, you are required to attend a seminar on Micro/Nano S&E on campus and submit a 2-paragraph summary of the seminar. You can attend a seminar sponsored by the Material Research Institute (MRI), Materials Research Lab (MRL), your department or any other S&E department, or one sponsored by your College if you can find a good topical match. I do not expect you to comprehend *all* of the technical details (!), but try to focus on the relevance to the scientific community and potential applications, and do your best to give an overview of the technical component.
2. Skim the New York Times (NYT) or USA Today 1-2 times per week for articles on the societal and political context of micro and nanoscale science and engineering, or on the general global or national research and development (R&D) enterprise. *The Tuesday editions of the NYT contain a special section entitled "Science Times" and you are all encouraged to skim this section regularly.* Submit at least 2 relevant articles throughout the semester. Examples of appropriate articles will be discussed in class, however, do not hesitate to bring in a related article that interests you even if you are unsure of its precise ME497J relevance! We can individually discuss whether or not the article fulfills the assignment and I am open to creative interpretations within reason. You can get free copies of these national newspapers through the PSU newspaper reader program with your ID. You are also welcome to bring in articles from the Centre Daily Times (CDT) or other newspaper for which you don't have a free subscription (Washington Post, LA Times, Chicago Tribune, Pittsburgh papers) if you happen across an appropriate article.