

Syllabus: MAE 124/ESYS 103 Environmental Challenges: Science and Solutions

Professor Sarah Gille

Lectures: Tuesday/Thursday 9:30-10:50, Solis 104

Discussion: Thursday 1, 4, or 5 pm or Friday 1 or 2 pm.

Professor's office hours: EBUII 568 (TBD) I'm also available in the classroom, before and after class, or by e-mail.

SIO Office: Nierenberg Hall 348 (e-mail or call for an appointment)

Telephone: 822-4425 *e-mail:* sgille@ucsd.edu

TAs: Office hours to be determined as needed. Contact for an appointment.

Marina Frants *e-mail:* mfrants@ucsd.edu

Krishna Sriram *e-mail:* ksriram@ucsd.edu

John Sorenson *e-mail:* jsorenso@ucsd.edu

Course website: <http://www-pord.ucsd.edu/~sgille/mae124>

Objectives: This is a course in environmental sustainability and sustainable development. We will examine environmental challenges including pollution, water resources, energy, global warming, population and land degradation. Then we will focus on strategies for addressing these challenges, through government intervention, industrial activity, design, and planning. The course aims to show that it is essential to understand, quantify and embed the environmental dimension (in its broadest sense) at every stage of consideration of industrial and economic activity. We focus on fundamental issues rather than detailed technical and scientific analysis. Lectures, in-class discussion, term papers and exams will ask you to think and synthesize material.

Specifically, by the end of the course, you should understand, and be able to discuss:

- the major environmental problems that need to be addressed to ensure sustainable development;
- the central roles played by market forces, technological innovation and governmental intervention;
- engineering and design approaches to take into account, and minimize the environmental impacts of industrial activity;
- environmental aspects of specific industrial sectors, such as energy, transport, land and water use, and the built environment.

Maintaining Academic Integrity: Students agree that by taking this course all required papers will be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the terms of use agreement posted on the Turnitin.com site.

This course will also adhere to the standard UCSD policy on academic integrity: "Students are expected to do their own work, as outlined in the UCSD Policy on Integrity of

Scholarship. Cheating will not be tolerated, and any student who engages in forbidden conduct will be subjected to the disciplinary process. Cheaters will receive a failing grade on the assignment or the exam and/or in the entire course. They may also be suspended from UCSD." See <http://www-senate.ucsd.edu/manual/Appendices/app2.htm> for details.

Reading:

- Brown, Lester R. *Plan B 3.0: Mobilizing to Save Civilization*. (2008) Norton
- Additional reading will be made available in electronic form. (This may include articles from books or print media.)

Grading:

- 20% paper 1. (4-5 pages: assigned April 2/3; preliminary plan due April 9/10, final version due April 21)
- 30% paper 2. (7-9 pages, assigned May 5; preliminary plan due May 14/15; final version due May 26)
- 10% participation/assignments/quizzes.
- 15% midterm (Thursday April 30, in class)
- 25% final exam (Tuesday June 9, 8:00-11:00 am)
- Late assignments will not be accepted.

Schedule Highlights. (See web for full details and reading assignments.)

Part I: Challenges for the Environment

- **Week 1:** Introduction (Tragedy of the Commons, Air Pollution).
- **Week 2:** Water resources.
- **Week 3:** Energy.
- **Week 4:** Population, Agriculture, Land Degradation, AND Global Warming and Climate Change.
- **Week 5:** Global Warming and Climate Change (continued)

Part II: Sustainability

- **Week 6:** Strategies for Sustainability.
- **Week 7:** Land Use and Urban Planning.
- **Week 8:** Energy and Climate Change.
- **Week 9:** Transportation.
- **Week 10:** Balancing Population with Food and Water Resources.