Syllabus for

ENV 340 Contemporary Topics in Environmental Science
M, W 4:00 to 5:20 pm in the Sustainability Studies Studio Room 370 Chemistry

Instructor: Dr. James Hoffmann
Office: Sustainability Studies Suite, Room W0517, Melville Library
Phone: 631-632-5366
Email: james.hoffmann@stonybrook.edu
Office Hours: Mondays and Wednesdays 2:00 to 3:00 pm, and by appointment
Blackboard: blackboard.stonybrook.edu

Course Description: Course explores one or more contemporary environmental science topics in depth. Topic(s) vary by semester. Examples of topics include: formation and fate of Asian Brown Cloud; Arsenic in Drinking water; Acid Rain; Environmental issues related to mining; Environmental impact of burning and mining coal; Pesticides and Herbicides in the Environment. Course may be repeated once.

Prerequisites: U3/U4; ENV 115 or CHE 131

3 credits

This Semester’s Course Topic: Ecological engineering of sustainable technologies for water treatment.

Additional Course Information: Class consists of an interactive mix of a few background lectures, in-depth student-led discussion of assigned readings, and a student team-based class project that results in a Wiki report and presentation. A major objective of this semester’s course is to deepen your understanding of Earth’s flow-limited stock of freshwater by facilitating a more comprehensive understanding of how nature renews and recycles its water. We will use the systems approach that provides a natural framework to understand the dynamics of biogeochemical cycling that occurs as water moves through the hydrologic cycle and is renewed. By comparing conventional treatment technologies, which rapidly clean dirty water with energy intensive and chemical additive methods to the equally effective but low energy and chemical-free green technologies, we will clearly show the advantages of the sustainable approach. The newly emerging green technologies of constructed wetlands, algal turf scrubbers, and “Living Machines” will be explored in depth through a few brief lectures of ecological engineering of water treatment systems followed by student-led discussion of selected papers. The integration of this knowledge occurs in a team-based design project of a sustainable water treatment system. This project involves gathering water use and effluent water quality data for a local site (i.e. the Long Island Aquarium, a campus dormitory…) and then using the data and the
system approach to design a “Living Machine” of the appropriate scale to effectively treat the water to a level that will meet the mandated Federal, State and county water quality standards.

Learning Objectives:

- Explain in depth how nature recycles and renews Earth’s water.
- Be able to apply a systems perspective to nature’s water treatment processes and human-engineered water treatment.
- Describe conventional water treatment methods in terms of their physical, chemical, biological principles.
- Describe the various types of green technologies for water treatment methods in terms of their physical, chemical, biological principles.
- Be able to contrast and compare conventional water treatment to ecologically engineered water treatment in terms of energy and chemical use.
- Demonstrate the ability to design and appropriately scale a sustainable water treatment system.

Required Text:
None, all readings are posted on Blackboard and include scientific articles, chapters from text books, news articles, web-based readings, and UN and government agencies reports.

Course Requirements:

Attendance and participation: Students are responsible for attending all course meetings. Attendance is taken each week at the beginning of class and counts toward your final grade. An unexcused absence, excessive lateness (more than 15 minutes) or leaving class early without prior permission will result in not earning attendance points for that day.

Mid-Term Exam: This will be a combination of short answer and essay-based questions assessing your knowledge of material covered in class and from the supplementary assigned readings on BlackBoard.

Design Project: Students use the principles of ecological engineering to design a sustainable water-treatment system. The project consists of:
1. A Wiki-based summary report with calculations and diagrams of their system.
Specific details of this assignment will be provided on the class BlackBoard site.

Grading:
Attendance and participation 10%
Mid-term exam 30%
Student-led class discussion of assigned paper 30%
Design Project:
- Wiki-based report 15%
- Presentation 15%
Percent | Grade
--- | ---
100 - 95 | A
94 - 91 | A-
90 - 88 | B+
87 - 84 | B
83 - 81 | B-
80 - 78 | C+
77 - 74 | C
73 - 71 | C-
70 - 68 | D+
67 - 60 | D

Basis for grading:

Tentative Meeting Schedule:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Course Introduction; Green Technologies Overview</td>
</tr>
<tr>
<td>2</td>
<td>Global Fresh Water, Hydrology; Peak Water;</td>
</tr>
<tr>
<td>3</td>
<td>Water Properties/Quality, Conventional Water Treatment</td>
</tr>
<tr>
<td>4</td>
<td>Green Technologies – Algal Turf Scrubbers (ATS)</td>
</tr>
<tr>
<td>5</td>
<td>Green Technologies – Constructed Wetlands</td>
</tr>
<tr>
<td>6</td>
<td>Green Technologies – Living Machines</td>
</tr>
<tr>
<td>7</td>
<td>Review Session; EXAM</td>
</tr>
<tr>
<td>8</td>
<td>SPRING BREAK</td>
</tr>
<tr>
<td>9</td>
<td>Introduce Project and Begin Article Discussions</td>
</tr>
<tr>
<td>10</td>
<td>Article Discussions and Project Work</td>
</tr>
<tr>
<td>11</td>
<td>Article Discussions and Project Work</td>
</tr>
<tr>
<td>12</td>
<td>Article Discussions and Project Work</td>
</tr>
<tr>
<td>13</td>
<td>Project Work</td>
</tr>
<tr>
<td>14</td>
<td>Project Work</td>
</tr>
<tr>
<td>15</td>
<td>Project Work; Course Summary</td>
</tr>
<tr>
<td>16</td>
<td>Final Exam</td>
</tr>
</tbody>
</table>
Blackboard: You can access class information, documents, and assignments on-line at: http://blackboard.stonybrook.edu If you used Blackboard during the previous semester, your login information (NetID and Password) has not changed. If you have never used Stony Brook's Blackboard system: for help or more information see: http://it.stonybrook.edu/services/blackboard For problems logging in, go to the helpdesk in the Main Library SINC Site or the Union SINC Site, you can also call: 631-632-9602 or e-mail: helpme@ic.sunysb.edu

Student’s Responsibility: Students are required to use their Stony Brook University e-mail for all official communications. Ensure you have entered a working email account in your Black Board account. Access your BB account and make sure that you have access to this class, send yourself a test email using the email option within BB. Adhere to deadlines for term paper and other assignments. Adhere to the formatting instructions for the term paper. Seek help from instructor when problems arise. Should you have a disability, follow the regulations spelled out below so that it can be evaluated as soon as possible.

Cell Phone and Electronic Devices: Use of cell phones, blackberries, laptop computers, iPads, MP3 players, and other audio and telecommunications devices is strictly prohibited during class. The only exceptions are through permission granted by the instructor for special purposes. Clickers are excluded from this prohibition, if required for the class. During regular class sessions, cell phones must be either in ‘vibrate mode’ or turned off. Calls cannot be answered. Text messaging is not allowed during class. Cell phones must be turned off and enclosed in a case, book bag, briefcase, or the like during tests and exams. YOU are responsible for ensuring this policy is followed. Students MAY NOT have cell phones, electronic dictionaries, calculators, pagers or other “information rich” devices (anything that can receive and/or store many pages of text) in their possession during tests and exams.

Academic Dishonesty Policy: Academic dishonesty is a serious offense and a breach of academic integrity that may result in failure of the course or failure for the individual paper or assignment. The “Code of Student Conduct” states that all forms of academic dishonesty, including the following are prohibited (see student handbook):

- Plagiarism – the intentional use of ideas or words of another as one’s own paper or other academic assignments. If you are unsure of what constitutes Plagiarism visit this document http://www.wpacouncil.org/positions/WPAPlagiarism.pdf or ask the instructor.
- Cheating during examinations, whether by copying from a fellow student or by using information in the form of unauthorized aids brought to the examination.
- The submission of work for any assignment that has been prepared by another student.

Academic Integrity Statement:
Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity,
including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html

**Classroom Policy:** Students are expected to follow the Stony Brook Code of Conduct while in the classroom. If you are not familiar with the Code you can find it at: http://studentaffairs.stonybrook.edu/sites/handbook/Code_1-22-03.pdf

Behavior that is disruptive to the function of the class, other students, or the instructor will not be tolerated. Poor class behavior or violations to the Code of Conduct will lead to removal from the class, possible withdrawal, or suspension. Food is not permitted in class. Beverages are OK, but please bring a container the can be closed to reduce spills. If a spill occurs please clean it up immediately.

**Instructional Responsibilities:** The University's statement of *Minimal Instructional Responsibilities* and *Minimal Undergraduate Student Responsibilities* are protocols with which you may already be familiar. They were established by the University Senate in 1996. If you have not already done so, please review them carefully. Both statements may be found beginning on page 81 of the* Academic Policies and Regulations* section of the on-line *Undergraduate Bulletin:* http://www.stonybrook.edu/ugrdbulletin/current/index.shtml

**DISABILITY SUPPORT SERVICES (DSS) STATEMENT**

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: http://www.stonybrook.edu/ehs/fire/disabilities

**CRITICAL INCIDENT MANAGEMENT:**

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn.

**Course Content:**

Course material accessed from Blackboard, SB Connect, SB Capture or a Stony Brook Course website is for the exclusive use of students who are currently enrolled in the course. Content from these systems cannot be reused or distributed without written permission of the instructor and/or the copyright holder.

Duplication of materials protected by copyright, without permission of the copyright holder is a violation of the Federal copyright law, as well as a violation of Stony Brook's Academic Integrity and Student Conduct Codes http://www.stonybrook.edu/uaa/academicjudiciary/policies.shtml
Electronic Communication Statement
Email and especially email sent via Blackboard (http://blackboard.stonybrook.edu) is one of the ways the faculty officially communicates with you for this course. It is your responsibility to make sure that you read your email in your official University email account. For most students that is Google Apps for Education (http://www.stonybrook.edu/mycloud), but you may verify your official Electronic Post Office (EPO) address at http://it.stonybrook.edu/help/kb/checking-or-changing-your-mail-forwarding-address-in-the-epo.

If you choose to forward your official University email to another off-campus account, faculty are not responsible for any undeliverable messages to your alternative personal accounts. You can set up Google Mail forwarding using these DoIT-provided instructions found at http://it.stonybrook.edu/help/kb/setting-up-mail-forwarding-in-google-mail.

If you need technical assistance, please contact Client Support at (631) 632-9800 or supportteam@stonybrook.edu.