IGNA COLLEGE
Scientific and Technological Literacy
Fall 2006

STL 115 Scientific and Technological Literacy: Environmental Theme

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Office: Cornelia 105 I
Office Hours: Tu 10:00, W 11:00, F 10:00
Meetings: Tu, F 9:00, C110; W (LAB) 9:00 – 11:00, C015
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Current environmental issues including Hazard and Risk Assessment, Global Warming, Bioengineering, Controlling Wastes, and Water Pollution.

Overview:

This course will build on the foundation laid in the prerequisite first STL course. A student entering this course is expected to bring experience with and the ability to make practical use of problem-solving techniques, modeling approaches, the systems viewpoint, and quantitative techniques involving graphing, standard algebra, and probabilistic reasoning. She/he is also expected to have had some practice in making, organizing and recording measurements, and in writing appropriate reports based on observations and hands-on activities. Moreover, fundamental concepts such as energy, the cell, atomic and molecular structure, the scientific laws of conservation, the genetic code, etc. should be familiar. By organizing this course about the theme of the environment, we are able to apply some of our basic skills and emerging literacy to interesting problems that illustrate many of the facets of science and technology at work in our society.

STL115 is a continuing study of science and technology in the context of societal concern about problems related to the environment: ecological interrelationships, global warming, implications of developments in the area of biotechnology for humans and the environment, resource use, and environmental decision making. In addition the methodology used in hazard and risk assessment will be examined. Case studies and/or individual student projects will be used.
Course Objectives

Students will

* Demonstrate an understanding and appreciation of our position in the environment and our contribution to it.
* Demonstrate a knowledge of the ways in which human activities affect the environment.
* Demonstrate skills in making and interpreting experimental measurements.
* Develop the skills to play an active role in the future of the environment (apply scientific concepts, principles, laws, and theories to contemporary issues along with other appropriate methodologies and be able to gather information from printed sources and electronic sources).
* Demonstrate the ability to use written and oral skills to present and discuss societal impact of science and technology (be able to construct and support hypotheses and arguments).
* Demonstrate an ability to critically assess issues involving science, technology, and society (distinguish knowledge, values, beliefs and opinions from one another).
* Demonstrate mastery of some basic principles of statistics and solve quantitative and mathematical problems along with interpreting graphs, tables and diagrams.

Prerequisite:

STL 100.

Required Texts:

2. STL 115 Laboratory Manual, prepared by Drs. Jerome Levkov and Robert Novak

Suggested Materials

You should have a scientific calculator (approximately $10).

Student Responsibilities:

To become eligible to earn a passing grade in this course, a student must first complete the course, which means: attend virtually all lectures, complete all laboratory activities, complete all assigned readings on time, submit all the required written assignments and reports, and take both the mid-course test and the final examination. Allowance will be made for a minimal number of absences

**(however, As outlined in the College Bulletin, unless the reasons for the absence or the quality of the student's work justifies an exemption from the rule, a student who has been absent from 20% or more of the scheduled lecture sessions may be dismissed)**
from the class and assigned the failing grade of FA. Missing more than 25% of the scheduled lab sessions will result in an automatic FA for the course. See College Bulletin, p. 30, for attendance policy).

but the professor must be informed in each case and, when possible, in advance. There may be explained absences; there are no excused absences. It will frequently not be possible to make up missed lab work, but arrangements can sometimes be made if the absence is anticipated or reported immediately.

Make-ups are not automatically given for tests and exams. The reason for the absence must be documented and compelling, and the opportunity to take a make-up test will be decided on a case-by-case basis.

Plagiarism, cheating or any form of intellectual dishonesty on any work for this course will result in forfeiture of all credit for that work with no opportunity to make up the loss.

Laboratory

Laboratory reports are due at the next lab session. Late laboratory reports, or project reports will receive a reduced grade. Failure to hand in a lab report will result in a grade of zero for that lab. Missing more than 25% of the scheduled lab sessions will result in an automatic FA for the course. All lab reports and other written assignments are to be done using a computer word processing program.

Hats, beepers, cell phones should be off in class and lab. Students should use restroom facilities before and after class and not during class. Students must be in class and lab on time. Attendance will be taken.

STL LECTURE SERIES

Two public STL lectures will take place during the semester. Both lectures will take place during college activities hours. Their topics and dates will be announced as soon as the arrangements are confirmed. Students in this course are encouraged to attend and extra credit will be given for written reports on the lectures. From time-to-time there may be other opportunities for extra credit such as events related to the course material.
<table>
<thead>
<tr>
<th>Grading Criteria</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Project</td>
<td>20%</td>
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<tr>
<td>Participation, Homework</td>
<td>15%</td>
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<tr>
<td>Hourly Exams (2)</td>
<td>20%</td>
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<tr>
<td>Labs</td>
<td>30%</td>
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<tr>
<td>Final Exam</td>
<td>15%</td>
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# LECTURE SCHEDULE  
(TENTATIVE)

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Reading</th>
<th>Questions</th>
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<tbody>
<tr>
<td>1.</td>
<td>The Environment</td>
<td>pp. 1-8</td>
<td>(To be assigned)</td>
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<td>2.</td>
<td>Environmental Statistics</td>
<td>pp. 11-17</td>
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<td>3.</td>
<td>Hazards and Risks</td>
<td>pp. 18-26</td>
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<td>4.</td>
<td>Hazards and Risks (cont’d)</td>
<td>pp. 27-40</td>
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<td>4.</td>
<td>Hazards and Risks (cont’d)</td>
<td>pp. 44-48</td>
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<td>5.</td>
<td>Global Warming</td>
<td>pp. 53-65</td>
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<td>6.</td>
<td>Genetic Engineering</td>
<td>pp. 69-78</td>
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**QUIZ # 1**

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<td>7.</td>
<td>Genetic Engineering (cont’d)</td>
<td>pp. 78-93</td>
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<td>8.</td>
<td>Municipal Solid Waste (MSW)</td>
<td>pp. 97-115</td>
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<td>9.</td>
<td>MSW (cont’d)</td>
<td>pp. 116-120</td>
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<td>10.</td>
<td>Waterborne Wastes</td>
<td>pp. 123-130</td>
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<tr>
<td>11.</td>
<td>Waterborne Wastes (cont’d)</td>
<td>pp. 131-141</td>
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**QUIZ # 2**

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<td>12.</td>
<td>Group Report Presentations</td>
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<td>14.</td>
<td>Group Report Presentations</td>
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<tr>
<td>15.</td>
<td>Group Report Presentations</td>
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LABORATORY ACTIVITIES
(TENTATIVE)

1. Biodegradability Assessment
   View videotape: The Hidden City; Prepare for Air Sampling lab
2. An Introduction to Polymers; The Gelation of Polyvinyl Alcohol
   Make Slime and Nylon.
   Analyze Biodegradation Study
3. Combustion of Plastic Refuse
   Analyze Biodegradation Study
4. Airborne Wastes and Human Respiration
   Analyze Biodegradation Study
5. Introduction to the Library and Information Resources.
6. Computer Simulation of Lake Pollution
   Analyze Biodegradation Study
7. Analysis of Airborne Contaminants
8. A Brine Shrimp Bioassay to Measure Toxicity
9. Personal Contribution to Municipal Solid Waste
   Analyze Brine Shrimp Study
10. The Clean Water Challenge
11. Qualitative Analysis of Lead
12. Quantitative Analysis of Lead
13. Limits of Detection
14. Detection of Lead Concentration in Water
15. Field Trip

PLEASE NOTE THE FOLLOWING IMPORTANT DATES:

September 4 Mon: Labor Day – No Classes
October 9 Mon: Columbus Day – No Day Classes, Evening Classes in session
October 10 Tuesday: Day classes follow a Monday Schedule of Classes
November 15 Wed: Last day to withdraw from semester classes with a W
November 22-24 Wed: Thanksgiving recess
December 11 Mon: Last Day Fall Semester Day Classes
December 12 Tues: Reading Day
December 13 - 18: Examination period
December 19 Tues: Alternate Exam Day – Snow Day
January 22 : First Day of Spring Semester Classes