

**Scientific and Technological Literacy:
Matter, Energy, Life and Systems
(STL 100)
Section D**

Instructor: Sunghee Lee, Ph.D

Office: Cornelia 105

Phone: 914-633-2638

FAX: 914-633-2240

E-mail: slee@iona.edu

Lecture: M, F, 11:00 – 11:52 AM (Cornelia 011)

Laboratory: W, 11:00 – 12:52 AM (Cornelia 010)

Office Hours: M, W, F 9:00 AM (or other times by appointment)

Credit: 3 Credits

Course Description:

A course designed to develop the foundation for the literacy necessary to understand technology's role in modern society. Basic scientific concepts underlying matter, energy, life and systems are introduced, and students engage in the development of reasoning and problem solving skills associated with scientific issues. The course is an introduction with applications to ecology, human biology and health, energy transformations and systems. Note: the course satisfies the prerequisites requirements for STL 105, 115, 125, 135, 145, 155, and 165. Class meetings include lecture and laboratory. Lab fee required.

Course Objectives:

As part of the core curriculum at Iona, each student takes a two-course sequence in STL. These courses are interdisciplinary, being staffed by faculty from Physics, Chemistry, and Biology departments. They focus on societal dimensions of science and technology by treating contemporary problems as course topics. The first course provides a broad view of the fundamental concept of energy and the role it plays in living and non-living systems. It deals with the principles as well as practical development of problem solving, critical thinking, and measurement skills. The second course concentrates on a particular theme, adding detail and depth to the study of an area of particular interest to the student.

By successful completion of the Scientific and Technological Literacy component of the core curriculum, students will:

1. Demonstrate an understanding of the nature of scientific knowledge and inquiry.
2. Apply scientific concepts, principles, laws and theories to generate multiple solutions to contemporary issues.
3. Apply scientific and engineering principles to solve problems, make decisions furthering their understanding of nature and technology.
4. Demonstrate an awareness of the interrelationship of science, technology and society.
5. Demonstrate the confidence to confront scientific and technological issues in areas such as human health, energy and the environment.
6. Provide students with a scientific understanding of the world we live in so that they might come to what to know more.

Required Text:

Campisi, Rosenberg, Stanionis. (2004). **Integrated Science: The Energy Code**. Dubuque, Iowa, Kendall-Hunt Publishers.
 Stanionis/Iona College Faculty. **Laboratory Manual for the Sciences**, 2nd ed. (1998). New York, NY, John Wiley and Sons, Inc.

Required Materials:

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

Quizzes/Exams:

Each of two 1 hour exams will deal with a specific group of chapters from the text. One two hours final exam is the cumulative exam. A missed exam counts zero. There will be no make-up exams.

Grading Criteria:

Two 1 Hour Exams	30%
One 2 Hour Final Exam	30%
LABORATORY REPORTS	30%
Preparation/Participation/Performance	10%
Total =	100%

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 all course tests and the final examination. Allowance will be made for a minimal number of absences (however, see College bulletin, page 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.

Laboratory:

Laboratory reports are due at the next lab session. **No late** laboratory reports, OR project reports will be accepted unless accompanied by a medical note from a physician. Five (5) points will be deducted for each day past the deadline, up to five days. Any report more than 5 days late will not be accepted and a grade of zero will be assigned. Attendance for laboratory sessions is mandatory and there are NO make-up lab sessions. 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.

Policy on Attendance:

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 will 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.

STL LECTURE SERIES:

Two public STL lectures take place each semester. Students in this course are required to attend and may earn extra credit by following the instructions of the instructor (for example; writing a critical analysis on some aspect of the lecture).

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.

Policy on Plagiarism and Academic Dishonesty:

Cheating on an examination other than the Final Examination will result in the loss of credit for that examination. Cheating on the Final Examination will result in failure of the course. Plagiarism of a homework assignment, lab assignment or computer project or the permission of such plagiarism will result in the loss of credit for that assignment.

Wk	Lecture Topic	<u>Textbook Reading</u>	Lab
1	Introduction to Scientific and Technological Literacy	Ch 1	1. Orientation
2	Pattern Recognition	Ch 2	2. Floating versus Sinking
3	Problem Solving: Blocks and Strategies	Ch 3	3. The Small and the Large
4	Models and Matter	Ch 4	4. Measuring Cell Size
5	Models and the Atom	Ch 5	5. Feedback and Control Models
6	Systems	Ch 6	6. Collecting Solar Energy
7	Information and Coding	Ch 7	7. Energy Conversions
8	Information and Coding in Living Systems	Ch 8	8. Problem Solving: Measuring Temperature with only Limited Means
9	Energy	Ch 9	9. Patterns of Problem Solving
10	A Primer: Energy Sources, Their Nature, and Use	Ch 10	10. Solar Constant and the Earth's Carrying Capacity
11	Energy Resources and Their Environmental Effects: The Carbon Cycle and More	Ch 11	11. Electromagnetic Spectra
12	Metabolism and Nutrition Operating Systems	Ch 12	12. Measuring Metabolic Rate by Indirect Means
13	Population and Growth	Ch 13	13. Medical Screening Tests
14	Medical Screening Tests	Ch 14	14. Schneider Cardio-Vascular Test
15	Technology and Risk	Ch 15	15. Project Reports