Integrated Science (Sci 101) Fall 2005  
** Tentative Syllabus **

Discussions:  MWF 12:50-1:50  
Science Building 218

**Dr. Steven Wiles**  
Office hours: Rm. 131 Science Hall  
10:30-11:30 MF, 3:30-4:30 T, 2:00-3:00 W, 1:00-2:00 R  
(or by appointment)  
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**Dr. Jocelyn Elson-Riggins**  
Office hours: Rm. 118 Science Hall  
M 9:30-11:30, W 9:30-10:30  
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**Dr. Stuart Snyder**  
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T 9:00-11:00 or by appointment  
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**Course Emphasis:**

This course is designed to introduce you to the basic principles of the biological and physical sciences. The intent is not to turn you into a scientist (which you already probably are in some way) but to promote the development of some skills that are inherent to science and important for a college graduate in a changing world. Hopefully, upon completion of this course you will be scientifically literate and able to carry out informed conversations on current topics such as genetic engineering, cancer, AIDS, environmental awareness issues, ethical implications of scientific practices etc…. Hopefully you will appreciate the logic of experimentation, learn how to interpret data, be able to examine scientific literature and participate in science-related debate, and question the underlying assumptions of science. Hopefully you will also recognize science as a process, a contributor to changing technology, and a valuable human endeavor.

This interdisciplinary approach will enable you to fulfill your general education natural science course requirements by completing a two-semester sequence. Each semester will have a 3 credit lecture (Sci 101 and 103) and a 1/2 credit lab (Sci 102). The course will seek to integrate principles of physics, chemistry, earth science and biology into the investigation of several topics: water and other molecules, light and its importance, natural resources, and health and disease. We will consider themes of organization, energy, transformation, and diversity.
In the Fall semester (Sci 101) we will cover the first themes (water and other molecules, and light and its importance). In the Spring semester (Sci 103), we will discuss natural resources and health and disease. During both terms we will conduct some laboratory investigations (Sci 102).

**Course Goals:**

1) To establish a true science learning community. This means we are all important players in the learning process. We share the responsibility to:
   a) come to class prepared
   b) actively participate by asking questions and discussing topics
   c) commit to learning as much as possible both as individuals and as a group

2) To establish structural and multidimensional literacy in science.
   Nominal literacy -- Many people are here!! They understand that something is scientific in nature but are naive in their understanding and have many misconceptions.
   Functional literacy -- Many people are here!! They use scientific vocabulary, define terms, but most things are memorized.
   Structural literacy -- We want to be here!! Students understand scientific concepts and procedures for studying science. They can explain these concepts in their own words.
   Multidimensional literacy -- We want to be here!! Students understand the relationship between science and other disciplines and the relationship between science and society.

**Assessment of your learning:**

To determine if you are meeting the goals of this course and learning, I will use a few different assessment methods. As much as is possible we will discuss the ideas we are covering so you can verbally convey your understanding (or misunderstanding). This will allow me to provide immediate feedback to you. Such forms of assessment will not count towards your grade for the course.

Written assessment will be used to formally determine how well you understand the material we are discussing. This assessment will take the form of written exams. I may use a combination of matching, multiple choice, true and false, short answer, essay, and problem solving questions in these exams. The schedule for the exams is found within this syllabus. Homework problems may also be used to monitor your progress, although they will not be used to determine your grade.

**Attendance:**

This course is designed to be interactive. Students will be expected to collaborate both inside and outside the classroom, therefore attendance is very important. There is no extra credit work in this class.

Make-up exams: An unauthorized absence from an exam will result in a grade of zero for the exam unless you have a signed excuse from an MD, law enforcement officer, or next of kin. There are a few (not many) valid reasons to miss an exam. If there is a valid reason for you to miss an exam, it is YOUR responsibility to notify me BEFORE the exam and complete the work prior to the exam if at all possible. Make-up exams are always harder than the original exam!
**Exams and points:**

Exams  
4 X 100 pts.  
400 pts.

**Grading:**

- 90-100%  A
- 80-89%  B
- 65-79%  C  ***Final grades are based on total lecture points.
- 50-64%  D  I reserve the right to utilize a grading curve to determine your final grade.
- Below 50%  F  I will not curve downward.

**Text and readings:**


Required readings will be assigned in class in advance. Focus questions will periodically be handed out and should be answered while conducting the assigned reading.

Tentative topics to be covered in Sci 101 and tentative schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>7 Sept.</td>
<td>Introduction to the course and What is Science?</td>
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**Matter and energy**

- 9 Sept  Matter, elements, atoms, compounds, molecules define energy
- 12 Sept  A Prelude to Energy: Motion and Force
- 14 Sept  Force, work
- 16 Sept  Potential and kinetic energy; Conservation of energy
- 19 Sept  Heat
- 21 Sept  Heat
- 23 Sept  Light
- 26 Sept  Light
- 28 Sept  Catch up
- 30 Sept  Review
- 3 Oct  Examination #1

**Chemistry**

- 5 Oct  Ionic and covalent compounds
- 7 Oct  Properties of water
- 10 Oct  Solvent properties of water, solutions
- 12 Oct  Concentration, acids, bases, pH
- 14 Oct  Review
- 17 Oct  Examination #2
### Aquatic ecosystems
- **19 Oct** Water and the environment
- **21 Oct** Water and the environment
- **24 Oct** Water and its importance to life
- **26 Oct** Aquatic ecosystems
- **28 Oct** Ecosystem structure and dynamics
- **31 Oct** Ecosystems and alterations

### Biology
- **9 Nov** The molecules of life: Carbohydrates
- **14 Nov** Lipids
- **16 Nov** Proteins
- **18 Nov** Nucleic acids
- **21 Nov** Cells
- **28 Nov** Cells
- **30 Nov** Membranes and transport
- **2 Dec** Enzymes and catalysis
- **5 Dec** Review / Catch-Up
- **7 Dec** Review / Catch-Up
- **9 Dec** Review / Catch-Up

12 (mon) **Examination #4** Monday Dec. 12th 8:00-9:50