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**OFFICE HOURS:** posted in class

**SEMESTER:** Spring 2016

**I. COURSE NUMBER AND TITLE, CATALOG DESCRIPTION, CREDITS:**

**ISC 1002C FOUNDATIONS OF INTERDISCIPLINARY SCIENCE II (3 CREDITS)**

Foundations of Interdisciplinary Science is designed to provide a broad foundation in science for non-science majors. The two-course sequence emphasizes scientific and laboratory activities in a hands-on learning environment. ISC 1002 covers the topics of energy, nuclear reactions and nuclear energy, chemistry, and environmental biology. The relationships of science to other fields of knowledge and to society are emphasized. This course is recommended as a general education course for non-science majors.

**II. PREREQUISITES FOR THIS COURSE:**

(SB 1720 Testing Exemption or successful completion of all Developmental courses)

**CO-REQUISITES FOR THIS COURSE:**

None

**III. GENERAL COURSE INFORMATION: Topic Outline.**

- Measurement and the metric system
- Energy, work, energy flow, conservation and resources
- Heat and molecular motion, including phase changes and associated energy aspects; thermodynamics
- Atomic theory and structure, including atomic mass and electronic structure
- Periodic table of the elements, including atomic and molecular properties
- Chemical bonding: ionic and covalent
- Chemical formulas, reactions, and equations, including stoichiometry
- Properties and sources of light
- Nuclear reactions, nuclear energy, medical applications
- Ecology, ecosystems, organismal interactions, habitat, carbon, nitrogen, and water cycles

**IV. LEARNING OUTCOMES AND ASSESSMENT:**

**GENERAL EDUCATION COMPETENCIES:**

General education courses must meet at least four out of the five following outcomes. All other courses

will meet one or more of these outcomes.

*Communication (COM):* To communicate effectively using standard English (written or oral).

*Critical Thinking (CT):* To demonstrate skills necessary for analysis, synthesis, and evaluation.

*Technology/Information Management (TIM):* To demonstrate the skills and use the technology necessary to collect, verify, document, and organize information from a variety of sources.

*Global Socio-cultural Responsibility (GSR):* To identify, describe, and apply responsibilities, core civic beliefs, and values present in a diverse society.

*Scientific and Quantitative Reasoning (QR):* To identify and apply mathematical and scientific principles and methods.

**ADDITIONAL COURSE COMPETENCIES:**

At the conclusion of this course, students will be able to demonstrate the following additional competencies:

LEARNING OUTCOMES	ASSESSMENTS	GENERAL EDUCATION COMPETENCIES
Describe and analyze the scientific method and use it to solve problems.	1. Written lab reports 2. Quizzes and tests 3. Assigned homework	COM, CT, TIM, GSR,QR
State and analyze the concepts of work and energy and use conservation of energy to explain the working of the physical world.	1. Written lab reports 2. Quizzes and tests 3. Assigned homework	COM, CT, TIM, GSR,QR
Analyze the basic concepts of thermodynamics and use them to solve problems on specific heat and phase change.	1. Written lab reports 2. Quizzes and tests 3. Assigned homework	COM, CT, TM, QR
Analyze the basic concepts of optics and use the principles of reflection, refraction, dispersion, interference and polarization to explain common phenomena in nature.	1. Written lab reports 2. Quizzes and tests 3. Assigned homework	COM, CT, TM, QR
State and analyze the basic ideas of atomic theory and use them to explain the periodic table, and differentiate between elements and compounds.	1. Written lab reports 2. Quizzes and tests 3. Assigned homework	COM, CT, TIM, QR
Use the concept of chemical bonds to explain various chemical reactions and construct and interpret chemical equations.	1. Written lab reports 2. Quizzes and tests 3. Assigned homework	COM, CT, TIM, QR
State and analyze the properties of water and water solutions and use them to explain the concepts of dissolving, concentration, solubility, electrolyte, boiling point and freezing point.	1. Written lab reports 2. Quizzes and tests 3. Assigned homework	COM, CT, TM, QR
Explain acid-base properties, pH scale, properties of salts and hard and soft water.	1. Written lab reports 2. Quizzes and tests	COM, CT, TM, QR

	3. Assigned homework	
Describe and explain the process of natural radioactivity, use it to solve simple problems, compare different types of decay and methods of measuring radiation, and criticize different proposals for and against the use of nuclear energy as a major source of energy in the 21 <sup>st</sup> century.	Project or class presentation or written paper on a physical phenomenon or an important issue such as the pros and cons of developing nuclear energy.	COM, CT, GSR
Analyze the energy flow in an ecosystem, compare different kinds of interactions between organisms, analyze the cycling of materials in the ecosystem, and appraise efforts towards the preservation of the environment.	1. Written lab reports 2. Quizzes and tests 3. Assigned homework	COM, CT, GSR

**V. DISTRICT-WIDE POLICIES:**

**PROGRAMS FOR STUDENTS WITH DISABILITIES**

Florida SouthWestern State College, in accordance with the Americans with Disabilities Act and the College's guiding principles, offers students with documented disabilities programs to equalize access to the educational process. Students needing to request an accommodation in this class due to a disability, or who suspect that their academic performance is affected by a disability should contact the Office of Adaptive Services at the nearest campus. The office locations and telephone numbers for the Office of Adaptive Services at each campus can be found at <http://www.fsw.edu/adaptiveservices>.

**REPORTING TITLE IX VIOLATIONS**

Florida SouthWestern State College, in accordance with Title IX and the Violence Against Women Act, has established a set of procedures for reporting and investigating Title IX violations including sexual misconduct. Students who need to report an incident or need to receive support regarding an incident should contact the Equity Officer at [equity@fsw.edu](mailto:equity@fsw.edu). Incoming students are encouraged to participate in the Sexual Violence Prevention training offered online. Additional information and resources can be found on the College's website at <http://www.fsw.edu/sexualassault>.

**VI. REQUIREMENTS FOR THE STUDENTS:**

Is very important that you come to class fully prepared and submit the assignment/quizzes on time. A lab report is due at the end of each laboratory session. Each experiment/lab is generally done in teams, but each laboratory report is completed and submitted individually. All assignments are due at their assigned times, regardless of absence. There are no make ups for missed experiments.

**VII. ATTENDANCE POLICY:**

Attendance in class is your responsibility. You are also responsible for all presentations and/or discussions taking place in the classroom. Part of your grade is derived from participation in classroom presentations and discussions, including group presentations conducted during the class session.

Classroom interaction is vital for the understanding of the major concepts in this course. If a class is missed, it is your responsibility to get from a fellow student, any material covered or assignments made during the session. If you miss more than two classes the instructor will expect you to schedule an appointment to discuss the situation.

**VIII. GRADING POLICY:**

The weight for exams, labs reports and homework is specified in the following table:

Assessment tool	Weight in %
3 Exams	30
12 Quizzes/Assignments	10
12 Lab reports	30
12 Classroom tasks	20
1 Essay	10
<b>Total:</b>	<b>100</b>

**Class participation/Essay:** I will evaluate the communication competency by measuring the degree of effectiveness in describing - in writing and orally - basic science concepts using examples from everyday experiences, or by describing, using standard language, the meaning of these concepts. Other means will be evaluating the success in presenting a topic to the class, as well as the ongoing oral participation during regular classes. Forms of intra-personal learning will be supplemented by inter-personal work and interactions designed to encourage discussion, clarification, and sharing of individual understanding of the concepts involved. The exams will include conceptual questions, problems and multiple choice questions drawn from lectures and labs.

Your final grade is calculated as a weighted average:

$$FinalGrade = \overline{Exams} \times \frac{30}{100} + \overline{Tasks} \times \frac{20}{100} + \overline{Quizzes} \times \frac{10}{100} + \overline{Labs} \times \frac{30}{100} + \overline{Essay} \times \frac{10}{100}$$

$$\overline{Exams} = \frac{(Exam_1 + Exam_2 + Exam_3)}{3}$$

Letter grades are assigned as follows:

90 – 100	=	A
80 – 89.9	=	B
70 – 79.9	=	C
60 – 69.9	=	D
Below 60	=	F

(Note: The “incomplete” grade [“I”] should be given only when unusual circumstances warrant. An “incomplete” is not a substitute for a “D,” “F,” or “W.” Refer to the policy on “incomplete grades.”)

**IX. REQUIRED COURSE MATERIALS:**

Integrated Science, 6th ed., Tillery, Enger and Ross (McGraw-Hill, 2011), ISBN: 9780077354824;  
 Integrated Science Lab Manual, Edison Custom edition, ISBN: 9780077736965 **OR**  
 Integrated Science Lab Manual, 5th ed. Tillery, Enger and Ross (McGraw-Hill, 2011), ISBN:  
 9780077292867.

**X. RESERVED MATERIALS FOR THE COURSE:**

None.

**XI. CLASS SCHEDULE:**

**(\*\*\*) NOTE: This schedule is a guideline and may change as the course progresses.**

Week	ISC 1002 Lecture Topics	Lab/Experiment
1	Syllabus presentation	Introduction, measurements
2	Chap. 1 Science, units, measurements	Ratios
3	Chap. 3 Energy I	Work and power
4	Chap. 4 Heat and Temperature I	Thermometer fixed points
5	Chap. 4 Heat and Temperature II	Specific Heat
6	<b>Exam I – Chap. 1, 2, 3</b>	Reflection, refraction
7	Chap. 7 Light I	Standing waves
8	Chap. 7 Light II	Telescopes
9	Chap. 11 Nuclear Reactions	Nuclear radiation Part
10	Chap. 8 Atoms and periodic properties	Physical and chemical change
11	<b>Exam II - Chap. 7, 8, 11</b>	Metal replacement
12	Chap. 9 Chemical Reactions	Measurement of pH
13	Chap. 10 Water and solutions	Conductivity of Solutions
14	Chap. 22 Ecology and environment; Ecosystems. (selected topics)	Identifying salts/ <u>Essay presentation</u>
15	Final Exam – <b>Cumulative</b> : Wednesday, May 4th, 8:00 AM;	

**XII. ANY OTHER INFORMATION OR CLASS PROCEDURES OR POLICIES:**

- You must abide by all the Laboratory Safety Rules provided to you and/or posted in the classroom /laboratory.
- Please note that eating and drinking are not allowed in the class and laboratory.
- It is expected that all assignments are your original work. If you misrepresent your work by using outside sources without fully and properly crediting those sources you may be subject to a grade penalty or disciplinary action. Looking at others' work or talking to another student **during exams** is considered cheating.
- Should any material in this syllabus contradict information in College Catalog, the Catalog governs.