

## Integrated Science I - NS 171 Fall 2008

This course is an introduction to chemistry and physics for future elementary educators. Not only will you learn about these subjects, so that you are comfortable bringing them into the classroom, but we will also explore ways of learning that foster conceptual understanding, curiosity and confidence. The prerequisite for this class is a "C" or better in Math 108 or satisfactory math placement. The lecture is MW 12:00 – 1:15 pm in MLH B10 and the laboratory is Wed 1:30 – 3:30 pm in MLH 230.

**Instructor** Dr. Rachel Jameton Phone: 792-2268 [rajameton@lcsc.edu](mailto:rajameton@lcsc.edu) Office: MLH 311 Office hours: M 1:30-2:30, T/Th 10:30-11:30, F 9:00-10:00 and by appointment

### Course Objectives

- To provide the pre-service teacher with an understanding of the scientific knowledge base that is taught in grades K-8 in most states.
- To foster enthusiasm for asking (and answering) questions about the physical world.
- To model a classroom that encourages confidence, teamwork and learning.

### Getting help

It is important to stay caught up in this course. If you get stuck on a subject or problem, do not hesitate to get help. One excellent resource is your classmates. Sometimes talking through problems can help clarify topics and teaching others is an effective way to learn. The Math and Science Tutoring Center is another vital resource. It is located on the first floor of MLH, down the hallway next to the stairs. There, students who have taken this or similar classes are available to help. Of course, I am here to help you too. My office hours are above.

### Special arrangements (such as incompletes, drops and making up quizzes, exams and labs)

Because at least two quiz grades, two homework assignments and two labs will be dropped, there will not be quiz or lab make-ups or late homework accepted. If you must miss an exam, discuss your situation with me *before* the exam to make alternate arrangements. It may not be possible to arrange an exam time if you do not notify me before the exam. No student will be allowed to make-up more than one exam. There will be no incompletes awarded for students with less than an 80% average at the time of the incomplete. The course cannot be dropped after Oct. 31. No late withdrawal permission slips will be signed.

### Class accessibility

If you have a documented learning disability or other situation that limits your access or ability to participate in class or lab, please discuss the situation with me as soon as possible so we can make appropriate arrangements. Assistance with accommodations can also be found at the Office of Student Life, room 111 Reid Centennial Hall.

## Evaluation

Your grade will be calculated based upon 10 quizzes, 3 tests, 12 laboratories, 10 homework assignments, 1 science fair project, 1 science and literacy project and 1 classroom experience, as outlined in the following table. More details about these assignments, as well as the grading scale, are below.

Your quizzes and tests will be returned to you in class, typically a week after the assignment is due.

ASSIGNMENT	POSSIBLE POINTS PER ASSIGNMENT	NUMBER OF ASSIGNMENTS	TOTAL POSSIBLE POINTS
QUIZZES	10	10	100
TESTS	100	3	300
LABORATORIES	15	12	180
HOMEWORK	10	10	100
SCIENCE FAIR	50	1	50
SCIENCE AND LITERACY	50	1	50
CLASSROOM EXPERIENCE	50	1	50
		<b>TOTAL</b>	830

### Quizzes

Quizzes every Monday will be composed of multiple choice questions and short answer questions, similar to those questions that you will find on the tests. Each will take about 10 minutes. While you will have at least twelve opportunities to take quizzes, only the top ten of your scores will be counted.

### Tests

There will be a total of three tests during the semester, including the final exam. The tests are worth 100 points each, and will be a mixture of multiple choice, fill in the blank, short answer and word problems. Tests will contain some questions from previously covered material, not just the new material since the last exam.

### Homework

Every week there will be a homework assignment due the following Wednesday *at the beginning of class*. This assignment will consist of a paragraph summary of the next chapter, two questions about the chapter and several selected problems. The assignments are worth 10 points each. In addition to the weekly homework, for each lecture or section there will be suggested problems for practice. It is up to you to do these and check yourself (the answers will be online a week after they are due). These are not only strongly recommended, but are crucial for mastering the course content. Late homework will not be accepted. Instead, only the top ten of your homework assignment scores will be counted (out of at least twelve).

**Laboratories**

The goals of the laboratory part of this class are:

- (1) To illustrate examples of activities that can be brought into the elementary classroom related to in-class material.
- (2) To offer strategies for connecting science and literacy that can be used in an elementary classroom. This includes the use of a science notebook.
- (3) To provide hands-on experience with in-class material.

Whether at the college level or the elementary school level, most people learn best by doing. The laboratory is your opportunity to do science. The activities will be easily modified for the elementary school level and will include a literacy component. You will meet once per week with your laboratory group. Your top twelve scoring labs will be counted. All of your labs will be carried out with a partner or group. You and your partner/group will work together but you must individually keep a science notebook that I will collect and check during quizzes and test times. Safety is of utmost importance in our lab. You must wear long pants and closed-toed shoes to lab, and wear safety glasses (available at the bookstore). We will have a complete safety orientation during lab.

**Science Fair project**

One of the greatest ways to learn a new subject is to teach it and, so, as a part of this class, you and a partner will design an activity for the class to do during a science fair for your peers at the end of the semester.

**Science and literacy project**

One way to handle the difficult task of finding time to fit science into the elementary school curriculum is to combine it with reading. For this project, we will practice finding books that present physical science concepts and developing activities to reinforce student learning. These activities will be combined into a booklet for you to keep.

**Classroom experience**

You will have the opportunity throughout the semester to help a local elementary school teacher with science activities and/or participate in a focus group assessing this course. You will receive credit for doing the activity, you will not be graded on it.

**Grading scale**

93-100%	A	83-86%	B	73-76%	C	60-66%	D
90-92%	A-	80-82%	B-	70-72%	C-	<60%	F

## Plagiarism policy

The vast majority of students are honest. However, in the rare instance that plagiarism (or cheating, fabrication or collusion) is apparent, it will be dealt with in accordance with college policy.

## Required Texts/Course Materials

- **Conceptual Integrated Science, 1<sup>st</sup> Ed.**, Hewitt. *et al.*, Pearson/Addison, 2007.
- A **scientific calculator** capable of performing trigonometric and square root functions, logarithmic and exponential operations.
- **Goggles** for laboratory.

## Timeline (subject to change)

WEEK OF...	SCAFFOLDED INQUIRY	WED. LABORATORY	HEWITT
8/25	Introduction Meas-SCI: Linear measurement	Meas-SCII: Mass	
9/1	<i>Labor day, no class 9/1</i> Meas-SCIII: volume	Meas-SCIV: temperature	
9/8	E/M-SCI: magnetic properties	E/M-SCI: magnetic properties	Chapter 7: Electricity and magnetism
9/15	E/M-SCII: electric circuits	E/M-SCII: electric circuits	
9/22	<i>Test 1</i> E/M-SCIII: series and parallel circuits	E/M-SCIII: series and parallel circuits	
9/29	E/M-SCIV: Electromagnetism	E/M-SCIV: Electromagnetism	
10/6	CHEM-SCI: matter, atoms and molecules	CHEM-SCI: matter, atoms and molecules	Chapter 9: The Atom/
10/13	CHEM-SCII: periodic table	CHEM-SCII: periodic table	Chapter 11: Investigating matter
10/20	CHEM-SCIII: mixtures CHEM-SCIV: solutions	CHEM-SCIII: mixtures CHEM-SCIV: solutions	Chapter 12: The nature of chemical bonds
10/27	CHEM-SCV: reactions	CHEM-SCV: reactions	Chapter 13: Chemical reactions
11/3	<i>Test 2</i> Science and literacy activity	KIN-uniform motion	Chapter 2: Describing motion
11/10	KIN-uniform motion KIN-acceleration	KIN-graphing motion	
11/17	KIN-forces	KIN-forces	Chapter 3: Newton's laws of motion
11/24	<i>Thanksgiving break</i>		
12/1	KIN-energy	Science fair	Chapter 4: momentum and energy
12/8	KIN-energy review	Science fair	
Meas = measurements		KIN = kinematics	

E/M = electricity and magnetism

SC = sub-concept

CHEM = chemistry