

NSC 131.02 Contemporary Science

Winter 2019

LECTURE: Mon. & Wed. 1:00 – 2:23 PM (ROOM 151, JAMES MCDIVITT HALL)

LAB: Mon. 2:30 – 4:20 PM (ROOM 133, JAMES MCDIVITT HALL)

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Materials: Electronic textbook *Conceptual Integrated Science* by Hewitt et al. (packaged with Mastering Physics Online Homework System); Calculator – Any model capable of exponents and scientific notation.

****Cell phones and other electronic devices may not be used on quizzes or exams****

Course Description: An interdisciplinary course that introduces the nature of science as a process. Particular topics from biology, chemistry, physics, geology and astronomy are covered with an emphasis on critical thinking and evaluating evidence to examine. This course is ideal as a first science course for students whose science background is minimal, who are anxious about science, or who have not had a science course for several years. The course includes a laboratory component.

Prerequisites: ENG 090 and MAT 030, or higher

Course Goals:

1. Understanding how science works as a process, and applying the same critical thinking skills used to evaluate evidence to everyday situations.
2. Becoming more scientifically literate, especially concerning contemporary issues.
3. Obtaining a working knowledge of measurement techniques, the metric system and construction & interpretation of graphs, diagrams and tables.
4. Examining the interrelatedness of the sciences, and the relationship of scientific investigation and social values.

By performing at the 70% level on examinations over lecture material and laboratory skills, students will fulfill JC General Education Outcome #4 (“Demonstrate Scientific Reasoning”), which assesses for:

- Describe issues raised by science for contemporary society
- Distinguish between scientific and other forms of reasoning
- Correctly use scientific terminology and explains basic principles, concepts, and theories
- Evaluates and effectively uses sources of scientific information.
- Draws appropriate conclusions from data.
- Correctly presents laboratory results and conclusions.
- Interpret charts, graphs, data and tables
- Correctly use scientific measurement systems including scientific units, scales and conversions
- Understand the difference between cause-and-effect vs. correlation

Math Content: Students will need to do the following: set up the scales on axes and graph data, find the slope of a line, make conversions between units, utilize scientific notation, and make calculations following a formula to produce an experimental result. *If you feel uncomfortable performing any of these skills, please contact me as soon as possible.*

Grades: Your course grade will be based on five exams, five laboratory quizzes, laboratory performance, out-of-class work, and in-class work. Each of these is assigned a point value, yielding a maximum of 800 points obtainable in the course.

Assessment	Points	Details
Exams	300	4 exams, each worth 100 points, <i>drop the lowest score</i>
Final Exam	100	This exam can <i>NOT</i> be dropped.
Lab Quizzes	100	5 quizzes, each worth 20 points
Labs	100	12 labs, each worth 10 points, <i>drop the lowest two scores</i>
Project	40	Data collected on specific topic and presented in groups
Out-of-class work	100	Both online and paper-and-pencil work
In-class work	60	Points assigned for attending & participating in class

Final grades will be assigned based on the percentage of possible points earned as follows:

Minimum %	90.0	85.0	80.0	75.0	70.0	65.0	60.0	50.0	<50.0
Minimum Points	720	680	640	600	560	520	480	400	399
Grade	4.0	3.5	3.0	2.5	2.0	1.5	1.0	0.5	0.0

Exams: All exams are a mixture of fill-in, multiple choice, problem solving, and essay questions based on specific topics. The final exam will be cumulative, covering the entire course. Students may use an 8.5"x11" sheet of notes (both sides, handwritten or typed) and a calculator for each exam. Exams can not be made-up or retaken under any circumstances. Exams are designed to take sixty to seventy (60-70) minutes.

NOTE: Due to the pace of the course, students will sit for exams at the **Testing Lab** (121 Bert Walker Hall - <http://www.jccmi.edu/testing-lab/>) outside of normal class time. Familiarize yourself with their policies. For any in-class exams, lecture will be held *after* the exam is taken.

Exam	Topics
1	Nature of Science, Scientific Measurement
2	Atomic Structure, Periodic Table, Radioactivity, Nuclear Power Plants
3	Waves, Doppler Effect, Spectroscopy, Cosmology, Energy
4	Energy Transport, Sun, Earth's Atmosphere, Climate Change, Seismic Waves
Final	Plate Tectonics, Earthquakes, Evolution, & Cumulative Questions

Laboratory: There are 12 laboratory exercises. The first exercise is designed to familiarize the student with how experiments are to be conducted, measurement theory and data analysis. During the remaining 11, students will collect and interpret data to verify some well-substantiated result. While students will work in small groups, each student must turn in their own data & results. Each laboratory has associated pre-lab questions to ensure that the student has read the background and procedure, and is prepared for the lab. These **pre-lab questions will be collected at the beginning of the lab period**. During the lab, **students will work in small groups and turn in a joint Data & Result worksheet**.

NOTE: In order to fulfill the General Education Outcomes for a laboratory science course, students must complete 8 out of the 12 laboratory exercises. *Failure to do so will result in a course grade of 0.0 regardless of the performances in the rest of the course.*

NOTE: Due to the fact that the laboratory rooms and equipment are not readily available, *make-up laboratories will not be possible*. However, the lowest two laboratory grades will be dropped.

Lab Quizzes: There are 5 lab quizzes. Students may use a calculator & one 8.5x11" sheet of notes (both sides, handwritten or typed). Each lab quiz is worth 20 points, and *may not be made up*. The topics are as follows:

Quiz	Topics
1	Introduction, Measurement, Density
2	Qualitative Analysis, Radioactivity
3	Spectroscopy, Energy Conservation
4	Specific Heat, Rock Identification
5	Photosynthesis & Respiration, Cells & Microscopy, Evolution

Project: After the third laboratory, all students will be presented a list of scientific topics from which groups can form valid hypothesis. Groups will propose hypotheses, and dedicated data-taking time will occur during laboratory meeting time #10a. A poster presenting the results will be due during the final lab meeting. Additional details will be made available on a separate handout. The project is worth 40 points.

Out-of-class work: Most of the assignments will be made available through the MasteringPhysics Online Homework system. This is also a primary means of communication outside of the class meetings. If you do not have internet access at home, you should set aside time to do this work utilizing a college computer.

See the handout from the first day for information on registering and logging into the Mastering Physics online system.

NOTE: Some topics may require written homework, which may be assigned.

In-class Work: There are 30 lecture meeting times. Students actively participating during the lecture will receive points. There is no way to make up any missed in-class work.

Incompletes: In accordance with JC's Incomplete Grade policy, a student may request the grade of Incomplete if they are unable to complete the coursework for some documentable, unforeseen circumstance. The Incomplete will be granted if at least 50% of the assigned work in the course (including exams) has been performed with an average grade of 2.0 and the student provides documentation of the circumstance. The student will be required to provide a detailed written schedule with due dates for making up the missing work during the following semester.

Course Help and Special Needs: If you have special needs that I should be aware of in order to help you to best learn course material, please let me know as soon as possible. Students requiring special assistance (especially those related to the Americans With Disabilities Act) should contact the Center for Student Success in 138 Bert Walker Hall as soon as possible. Tutoring services are also provided, free of charge, at JC at the Center for Student Success.

JetNet Resources: Course materials can be accessed through the JetNet course management system. This is the way you will be able to view your grades, announcements, screencasts, animations, etc. You are expected to use JetNet postings to help you track assignments and due dates.

Plagiarism and Cheating: Be sure that *all* homework and assignments are *your own work*. Copying someone else's work is plagiarism, and plagiarized work **will not be accepted**. Evidence of plagiarism or cheating on any exam or assignment may result in a "0" score for that assignment (with no possibility of dropping the zero), or a failing grade for the entire course, as deemed appropriate by the instructor.

Jackson College's Academic Honesty Policy

Academic honesty is expected of all students. It is the ethical behavior that includes producing their own work and not representing others' work as their own, either by plagiarism, by cheating, or by helping others to do so.

Plagiarism is the failure to give credit for the use of material from outside sources. It includes but is not limited to:

- Using data, quotations, or paraphrases from other sources without adequate documentation
- Submitting others' work as your own
- Exhibiting other behaviors generally considered unethical

Cheating means obtaining answers or material from unauthorized sources. It includes, but is not limited to:

- Plagiarizing in all forms
- Using notes/books without authorization
- Copying
- Submitting others' work as your own or submitting your work for others
- Altering graded work
- Falsifying data
- Exhibiting other behaviors generally considered unethical

Collaboration

While JC encourages students to collaborate in study groups, work teams, and with lab partners, each student should take responsibility for accurately representing his/her own contribution.

Student Appeal Process

In the event of a dispute, both students and faculty should follow the Conflict Resolution Policy.

The policy is presented in the Student Rights and Responsibilities section of the *Student Handbook*.

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Tentative Course Calendar

(Dates Approximate & Subject To Change)

Week	Dates	Topics	Textbook Reading	Laboratory
1	1/14, 1/16	Course Introduction Nature of Science Scientific Method	<i>Chapter 1</i>	Go over Safety in the Lab
2	1/21, 1/23	Scientific Measurement Conversions	<i>Appendix A Ch. 6.2-6.3</i>	1. Intro to Data Taking & Analysis
3	1/28, 1/30	Atomic Structure Periodic Table	<i>Ch. 9</i>	2. Scientific Measurement <i>EXAM 1 STARTS</i>
4	2/4, 2/6	Radioactivity	<i>Ch. 10</i>	3. Density
5	2/11, 2/13	Nuclear Power Plants		Lab Quiz #1 4. Qualitative Analysis
6	2/18, 2/20	Waves Doppler Effect	<i>Ch. 8.1-8.4, 8.6 Ch. 8.13</i>	5. Radioactivity PROJECT HYPOTHESIS DUE <i>EXAM 2 STARTS</i>
7	2/25, 2/27	Spectroscopy Cosmology	<i>Ch. 9.4, Ch. 8C</i>	Lab Quiz #2 6. Spectroscopy
8	3/4, 3/6	Energy Heat	<i>Ch. 4.5, 4.7, 4.8, 6.4, 6.6, 6.8-6.10</i>	7. Energy Conservation EXPERIMENT WORKSHEET DUE
9	3/11, 3/13	SPRING BREAK -- NO CLASSES		
10	3/18, 3/20	Sun Solar Power	<i>Ch. 28.2</i>	8. Specific Heat <i>EXAM 3 STARTS</i>
11	3/25, 3/27	Earth's Atmosphere Wind Power	<i>Ch. 26</i>	Lab Quiz #3 9. Rock Identification
12	4/1, 4/3	Climate Change Earth's Structure	<i>Ch. 27A Ch. 22.2, 22.3</i>	10a. Project Data Collecting
13	4/8, 4/10	Seismic Waves Plate Tectonics	<i>Ch. 22B Ch. 22.4-22.7 Ch. 27.1-27.3</i>	Lab Quiz #4 10b. Photosynthesis & Respiration <i>EXAM 4 STARTS</i>
14	4/15, 4/17	Evolution	<i>Ch. 15, 18</i>	11. Cells & Microscopy
15	4/22, 4/24	Evolution	<i>Ch. 16, 17</i>	12. Evolution
16	4/29, 5/1	Review Final Examination		Lab Quiz #5 POSTER PRESENTATIONS <i>FINAL EXAM</i>