NSC 131.SI1 (12-Week) Contemporary Science, Spring 2021

Live Sessions: Tuesdays & Thursdays 1:00 – 3:00 PM (Zoom)
Dates: 11 May (Tuesday) - 5 August (Thursday), 2021

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Remind: https://www.remind.com/join/nsc131sp21

Materials: Electronic textbook *Integrated Science* by Tillery et al. (included with **McGraw-Hill Connect** Online Homework System); **Calculator** – any model capable of exponents and scientific notation; **Remind** app (for communication: **https://www.remind.com/join/nsc131sp21**); **Internet access**; **A web camera & microphone** (for class sessions, communication, and examinations)

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:* MAT 033, 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 course assessments, 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 a result. *If you feel uncomfortable with any of these, please contact me as soon as possible.*

Grades: Your course grade will be based on exams, laboratory explorations, textbook work, and homework. Each of these categories will be weighted in the overall grade as follows:

Grading Scale:

90 -100% →	4.0	65 - 69% →	1.5
85 - 89% →	3.5	60 - 64% →	1.0
80 - 84% →	3.0	50 - 59% →	0.5
75 - 79% →	2.5	0 - 49% →	0.0
70 - 74% →	2.0		

Overall Grade Categories, with Weights:

Homework: *25%*
Textbook Work: *10%*
Laboratory Explorations: *25%*
Midterm Examinations: *30%*
Final Examination: *10%*

COURSE ASSESSMENTS:

Exams: The course is broken into five "units," each of which has an exam. All exams are a mixture of fill-in, multiple choice, problem solving, and short answer questions, all based on specific topics. The final (5th) exam will include some cumulative questions, covering the entire course. Students may use an 8.5"x11" sheet of notes (both sides, handwritten or typed) and a calculator for each part of each exam. Exams are designed to take approximately fifty to sixty (50-60) minutes, and will take place at least partially within the JetNet course.

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
Final	Seismic Waves, Plate Tectonics, Earthquakes, Evolution, & Cumulative Topics

Laboratory Explorations: The laboratory explorations are designed to engage students in critical thinking, connections with key concepts of the course, measurement theory and data analysis, while also familiarizing students with how scientific experiments are conducted. While students will work in small groups on their explorations, each student is responsible for contributing to and understanding the data and results.

NOTE: In order to fulfill the General Education Outcomes for a laboratory science course, students **must complete at least 75%** of all laboratory explorations. *Failure to do so will result in a course grade of 0.0 regardless of the performances in the rest of the course*.

Group Experiment Project: As part of the overall Laboratory Explorations grade, students (in groups) will select a scientific topic, form a valid hypothesis, and propose a data-collection procedure, all within a presentation that will be shared with other groups. Additionally, each group will review and critique the works of others in a peer review process.

Textbook Work: Both reading and interactive assignments will be made available through the MH Connect online homework system. This is also the primary means for accessing the textbook.

Homework: Work consists of quizzes, activities, and exercises covered during live sessions, and may be completed outside of this time. These will be in relation to reading & videos viewed online.

COURSE POLICIES:

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 due to documentable, unforeseen circumstances. The student must speak with the instructor, who must give permission and make the necessary arrangements.

Attendance: Students are expected to attend all live sessions, arriving on time, and staying until the end. The student is responsible for obtaining any missed materials from other students or online postings; that is to say, office hours are not a replacement for class time. Moreover, homework and exams may not be made up. Electronic submission of homework and exams have set, specific deadlines that are announced and posted. In accordance with JC's attendance policy, a student may be dropped (or withdrawn) from the course for ongoing lack of participation or attendance at the instructor's discretion.

Plagiarism and Cheating: Be sure that ***all*** submitted work is *your own work*. Copying someone else's work is plagiarism, and plagiarized work **will not be accepted**. Evidence of plagiarism or cheating on an exam or assignment may result in a "0" score for that exam or assignment, 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 content 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

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*.

Course Expectations: The following are expectations that we can all share throughout this course.

- **We are each responsible** for our work, our learning, and our behavior.
  - This course will require consistent, mindful effort on your part. Science is a subject that requires regular, thoughtful practice to understand and master.
- **We are each respectful** of everyone in the course (including ourselves).
  - Please share audio and video during sessions to further communication, minimize any distractions in your environment during sessions, and come prepared & on time to ask/answer questions and work together with your colleagues.
- **We are patient and persistent**, even in the face of frustration (with others or ourselves).
  - In science, it is not only understandable to be a little 'stumped' by concepts at first, this is to be expected. *What separates successful students from unsuccessful ones is almost entirely patient persistence, and a willingness to engage with others.*
- **We will communicate with each other promptly** regarding problems or concerns.
  - Regular, direct communication solves more problems than it causes. Please do not hesitate to contact me for any reason, and I will do the same.

ADDITIONAL RESOURCES:

Course Help and Accommodations: If you have specific 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** as soon as possible. Supplemental Instruction sessions and online tutoring services are also provided, free of charge, via the Jackson College **Tutoring Center**.

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Tentative Course Calendar

(*Content & Dates Subject To Change*)

Unit	Dates	Topics	Textbook	Lab Work
1	T, 5/11	Course Introduction; Learning Tools for the Course		
		Nature of Science	Chapter 1	
		Scientific Method; Scientific Measurement	Appendix A; §4.2	**#1.** Introduction, Data Taking, & Measurement
2	Th, 5/20	Atomic Structure	§8.1, §8.2	
		Periodic Table	§8.4, §8.5	**#2.** Density
		Radioactivity & Nuclear Decay	§11.1-11.2	
		Nuclear Power Plants	§11.3	**#3.** Radioactivity
3	Th, 6/10	Waves - Sound & Light	§5.1-5.4, §7.1-7.2	
		Doppler Effect	§5.6	
		Spectroscopy	§7.3, §12.4	**#4.** Spectroscopy
		Cosmology & Big Bang	§12.1-12.3, §12.7	
		Energy	§3.1-3.3	
4	T, 6/29	Heat	§4.1, §4.3	**#5.** Molecules & Light
		Energy Transport Mechanisms		
		Sun & Solar Power	§3.4-3.5	
		Our Atmosphere & Wind Power	§17.1-17.2	**Experiment Design**
		Climate Change	§17.5-17.6	
5	T, 7/20	Earth's Structure	§15.1-15.2	
		Seismic Waves	§16.2-16.3	**#6.** Rock Identification
		Plate Tectonics	§15.3	
		Evolution - Nature of Life	§20.1-20.2, §22.1-22.2	
		Evolution - Mechanisms	§21.2-21.7, §22.6	**#7.** Evolution
		Evolution - Evidence & Genes	§21.10	
	Th, 8/5	Group Experiment Final Presentations		**Experiment Design Group Presentation**

****Note**: All live sessions will be recorded and made available via a private YouTube playlist.