

SCI 111: Physical Science
Fall 2021
Maine School of Science and Mathematics

Class Meetings

Class Blue days 11:00 AM–12:20 PM **Lab** Tuesday 1:30 PM–3:30 PM

Location room B216.

Instructor

Richard Barrans, Ph.D., M.Ed.; barransr@mssm.org

Office Hours Sun 6:30–7:30 PM; Blue MTRF 9:30–10:30 AM; Blue W 8:00–9:00 AM;
Gold M 2:30–3:30

Objectives

After completion of the first semester of this course, the successful student will be able to:

- Describe the contents and structure of the solar system.
- Explain the formation and structure of geologic features.
- Explain the forces and interactions that determine the weather and climate.

Course Content and Approach

What is the universe made of? How does it operate? What is our place in it? How can we find out? In this course, students explore these questions. Students are invited to learn not only *what* we know about the universe we live in and the earth we live on, but especially *how* we have learned it and continue to learn more. The first semester of this course is an introduction to earth and atmospheric science. The second semester is an introduction to physics and chemistry. Laboratory activities, in which students can directly observe systems, gather data, analyze authentic evidence, and draw conclusions, are a critical component of the class.

Textbook

EarthComm, by Carpenter and Hoover, published by It's About Time, 2012.

Grading

Your year grade will be the average of your grades from the first and second semesters.

Your grade for the first semester is determined from your scores on the different course components.

Projects	30%
Laboratories	25%
Homework	20%
Quizzes	10%
Midterm exam	10%
Discussion	5%

Grading for the second semester will be detailed in its own syllabus.

Projects

Projects are tasks in which you produce an output that demonstrates your understanding of the course material. Most projects include both individual and group effort. Each project will be detailed in its own assignment.

Laboratories

Labs are graded based on what you do in lab and your lab report. Most labs are hands-on activities conducted in groups.

Written lab reports, if required, are due at the beginning of the next lab. Some lab reports may be submitted by an entire lab group; others must be submitted individually by each student. I will clearly communicate which is the case for each lab.

Homework

Homework is assigned approximately every other class meeting. Each homework is graded in two parts: the rough draft and the final draft. The rough draft, worth half of the total, is due at the next class meeting. It is graded on evidence of an earnest effort to tackle the problems. You will receive feedback on your work, and the class as a whole may receive collective feedback.

The final version is worth the other half of the total. It is graded on explaining how to approach and answer the question.

Quizzes

There will be a brief quiz on most blue Thursdays. Quizzes assess your mastery of recent topics and give examples of the types of problems that may be posed on the midterm.

Midterm Exam

This is a cumulative exam during midterm week covering the topics from the semester.

Discussion

Each week you will post about something good in your life, you will post about a connection you found between course material and the world outside this class, and you will respond to someone else's post.

Expectations

Class

Attendance is expected at all classes. Chances are pretty good that what I teach in class will be covered in a quiz.

Absences

Quizzes missed due to an excused absence may be made up. Arrangements for make-up quizzes must be made within seven calendar days of your return to class.

If you are unable to attend a lab due to an excused absence, contact me at your earliest convenience. I may either schedule a make-up at another time or pro-rate your missed lab.

Laboratories

It is expected that you will work in groups in lab. Many of the experiments require several people just to take the data. Groups may contain four or fewer students; obtain instructor permission *each time* for larger groups. All group members are responsible for completing all data tables, graphs, and analyses. Your instructor may check the data record of any group member to evaluate the group's work and data collection.

Resources

Contacting the Instructor

During my listed office hours, I will be physically in my room, or I will leave a note on my desk stating where I can be found nearby (lab, main office, ...). You are also invited to see me in my room at other times—if the door is open, please come in.

If visiting me is inconvenient, the very best way to contact me is by e-mail. I can pretty much guarantee that I will forget any conversation in class. If I have my wits about me when you speak to me in class, I will ask you to send me an e-mail to remind me of what we discussed. If I forget, please send the e-mail anyway.

The hour immediately before a class is not a good time to contact me, because I will be concentrating on preparing for class. After class is usually better, unless I am in a hurry to tidy up before the next class.

Textbook

The textbook is your first source of information. The assigned sections of the text are best read by each student before class.

Internet

Current scores for projects, homeworks, labs, etc. will be posted on Infinite Campus. Assignments will be posted to Canvas, and many of them will be submitted to me through Canvas. I may post supplementary resources on Canvas.

Academic Integrity

2021-2022 Community Handbook

At MSSM, students and staff take great pride in academic honesty and a supportive academic environment. All are expected to maintain habits of rigorous debate, healthy inquiry, and the vigorous pursuit of truth. Academic dishonesty, in any of its forms, disrupts the learning process and tarnishes the integrity of our community. As a result, MSSM will treat instances of academic dishonesty very seriously.

If an instructor grants permission, students may collaborate in completing assignments and homework. Any unauthorized collaboration, copying, using of notes on exams/major

assessments, storing of non-permitted information on calculators or on computers, or any other unacceptable activity that gives a student or a group of students advantages over others is cheating and will not be tolerated.

While the assimilation of ideas from many sources is basic to academic research and intellectual development, students must always reference the use of any non-original materials. Failure to do so is plagiarism and this dishonesty impairs an instructor's ability to accurately evaluate a student's performance. Plagiarism is using someone else's ideas, wording, or data without proper or complete acknowledgment. Credit must be given for ideas and information that belong to someone else, whether it is quoted, summarized, or paraphrased. Faculty members may require that notes, drafts, and a list of sources be submitted along with the finished project. Failure to provide evidence of the work process may constitute an admission of plagiarism.

Disclaimer

Information in the syllabus was, to the best of the instructor's knowledge, correct when distributed at the beginning of the term. However, if extraordinary circumstances require changes to instructional techniques or grading procedures during the term, students will be notified in class and by e-mail.

Notice of Non-Discrimination

MSSM does not discriminate on the basis of race, color, sex, sexual orientation, gender identity or expression, religion, ancestry, national origin, genetic information, or disability in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies:

- Dr Greg Hamlin (he/him/his)
- Title IX Coordinator, Affirmative Action Officer
- Email: hamling@mssm.org
- Cell: 1-413-370-4769

For further information on notice of non-discrimination you may contact the U.S. Department of Health and Human Services, Office for Civil Rights. Web: <https://www.hhs.gov/ocr/index.html>, Phone: 1-800-368-1019, Email: OCRMail@hhs.gov, TDD: 1-800-537-7697.

Tentative Schedule

Day	Topic	Reading	Assignment	Quiz
M 8/23	Introduction, Solar system	1.1		
T 8/24		<i>Lab 1: Solar system</i>		
W 8/25	Earth's place in the universe	1.4–1.6	H1↑	
F 8/27	Plate locations	2.1–2.3	H1R↓; Game project I↑	
T 8/31	Plate environments	2.4–2.6	H2↑	
T 8/31		<i>Lab 2: Plate Boundaries</i>		
R 9/2	Volcanoes	2.7–2.9	H1F↓; H2R↓	1
M 9/6	Earthquakes	2.10–2.12	H3↑	
T 9/7		<i>Lab 3: Topographic maps</i>		
W 9/8	Work day		H2F↓; H3R↓	
F 9/10	Minerals; sedimentary rocks	3.1–3.2	H4↑; Locale project↑	
T 9/14	Igneous and metamorphic rocks	3.3–3.4	H3F↓; H4R↓; Game project I↓	
T 9/14		<i>Lab 4: minerals</i>		
R 9/16	Rock units and geologic structures	3.5–3.6		2
W 9/22	Historical Geology	3.7–3.8	H5↑	
F 9/24	Work day		H4F↓; H5R↓	
T 9/28	Water and streams	4.1–4.2	H6↑; Game project II↑	
T 9/28		<i>Lab 5: Rocks</i>		
R 9/30	Stream landforms	4.3–4.5	H5F↓; H6R↓; Locale project I↓	3
M 10/4		4.6–4.7	H7↑	
T 10/5		<i>Lab 6: Streams</i>		
W 10/6	Glaciers	4.8	H6F↓; H7R↓	
F 10/8	Sand	4.9–4.10	H8↑	
T 10/12	Work day		H7F↓; H8R↓	
T 1.0/12		<i>Lab 7: Geological maps</i>		

Day	Topic	Reading	Assignment	Quiz
R 10/14			Game project II↓	4
R 10/21	Global circulation	5.1–5.2	H9↑; Locale project II↑	None
M 10/25	Thunderstorms	5.3–5.4	H8F↓; H9R↓	
T 10/26		<i>Lab 8: Atmospheric physics</i>		
W 10/27	Tropical cyclones	5.5	H10↑	
F 10/29	Oceanic circulation	5.6–5.8	H9F↓; H10R↓	
T 11/2	Climate	5.9	H11↑	
T 11/2		<i>Lab 9: Convective potential</i>		
R 11/4	Work day		H10F↓; H11R↓	5
M 11/8	Past climates	6.1–6.3	H12↑; Climate FAQ project↑	
T 11/9		<i>Lab 10: Water plant</i>		
W 11/10	CO ₂	6.4	H11F↓; H12R↓	
F 11/12	Sea level	6.5–6.7	Locale project II↓	
T 11/16	Work day		H13↑;	
T 11/16		<i>Lab 11: Feedbacks</i>		
R 11/18			H12F↓; H13R↓	6
M 11/29	Evolution of Earth	8.1–8.4	H14↑	
T 11/30		<i>Lab 12: NWS</i>		
W 12/1	Geologic time	8.5–8.6	H13F↓; H14R↓; Climate FAQ project↓	
F 12/3	Biological Evolution	8.7	H15↑	
T 12/7		8.8–8.9	H14F↓; H15R↓	
T 12/7		<i>Lab 13: Geologic timeline</i>		
R 12/9			H15F↓	None

* R = rough draft, F = final draft; ↑ = assigned; ↓ = due.