

MEGAGEOLOGY

Geology 105: Syllabus



Course Description

Megageology is a study tracing the history of the Earth from the origin of the solar system to the present. Also considered are the origin and evolution of the Earth's crust and interior; continental drift and mountain building; absolute age dating; the origin of the hydrosphere and atmosphere; earthquakes and volcanism; and the conditions necessary for constructing a habitable planet. The results of recent planetary exploration are also incorporated into an examination of the origin of the solar system.

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The best way to contact us both is by email. We will communicate as a class by electronic mail, including any announcements or amendments in assignments and class schedule, so it is essential that you use email and **check it regularly** (~daily or every other day). You can either call or send email to set up an appointment for a guaranteed meeting, or come by our offices.

Course Objectives

You should, ideally, take something away from this course at three levels. First, every inhabitant of our planet should know about its formation, evolution, and the processes that keep it running. Second, there are a number of current geological issues that will affect the way you live the rest of your life, such as natural hazards, energy resources, global warming, and the possibility of life on other planets. We'd like you to be able to assess those issues critically yourself, so that you don't have to rely on politicians, newscasters, or anyone else as your primary sources. Finally, a number of you will use geology in your careers, and we'd like to provide you with solid base upon which you will continue to build in the future.

Location and Meeting Times

Lathrop 209, 1:20-2:35 PM Mondays and Wednesdays

Required Text

Earth's Dynamic Systems, Tenth Edition, Hamblin and Christiansen

Course Requirements

You will be responsible for the following assignments:

2 Midterm exams @ 20% each	40%
Final exam	22%
Participation (Class activities/short assignments)	10%
2 Reality Movie Reviews	18%
<u>2 labs</u>	<u>10%</u>
Total	100%

Grades will be assigned according to the following *approximate* scheme:

A = 90%	C = 70%
A/B = 85%	C/D = 65%
B = 80%	D = 60%
B/C = 75%	

Exams

There will be two midterm exams and a final (see schedule for dates). The exams are designed to make sure you understand the details of what we've been discussing in the course. They will be based primarily on material we've covered explicitly in class with the readings in the book as a supplement. Thus, it is essential that you not miss any class meetings. The exams will also ask you to think beyond the concepts in class and apply them to new situations, as well as expand on information from the text. Be assured that if you know the material solidly, you will always have the necessary information to answer all the questions, even if they may sound unfamiliar at first. The midterms will be scheduled outside of class time, in the evenings, so that you do not have to work against the clock. The final will take place as scheduled during the final exam period. We will have review sessions before each exam, most likely during the evening. Exams must be taken as scheduled except in the case of a dire emergency. **If you need special accommodations for the exam, you should see us well before the exam date (5-7 days at least).**

Class Activities

We will be doing a variety of different activities in class. Sometimes there will be short assignments associated with these, either beforehand to prepare for them or afterward as follow-up investigations; some of them we'll finish during class. The sum of these assignments plus our interpretation of your participation in the course will make up 10% of your final grade. They will also serve as a means for us to gauge your participation in class. Finally, they give us a way to get to know you faster to minimize that rather enormous class size feeling.

Reality Movie Reviews: The Great Geological Film Series

We will show a number of movies outside of class (schedule is at the end of this document). You are responsible for watching TWO of these films and writing a brief **Reality Check Review** for each one, in which you analyze the film in terms of its geological plausibility. These two reviews will constitute a significant part of your final grade. You may choose any **two** of the films. Some details:

- 1) In the review, consider whether the events depicted in the film are realistic or not (some of the movies will be realistic, others will be ridiculous and totally absurd...most should be at least marginally entertaining). You should discuss **three** specific issues or events in the film to get full credit (e.g., landscape, atmosphere, an activity or action, anything related to our course). For each issue or event, you should assess how realistic or unrealistic it was, why, and how it could be improved. **You must support each of your three statements with facts from your sources** (see (2) below), not just common knowledge. In other words, you must have looked something up and found a fact or figure or piece of information that supports your assertions about the movie events *for each of your three observations/issues*. For instance, if you state that the surface of Mars is shown to be too warm, you need to look up the average annual temperature on the Martian surface from a reliable source and include the actual value *and* the reference for that information in the review.
- 2) Your review should be at least 1.5 pages long (double-spaced, 12 point font, 1 inch margins) and no longer than 2 pages. No exceptions here, which means that you won't get full credit if it's too long, too short, or completely contorted to fit into the page limit. Follow the guidelines. Feel free to include diagrams or pictures if they help your arguments but do not substitute these for the 1.5 – 2 pages of required text.
- 3) You must use **at least one source in addition to your textbook** to support your conclusions and opinions and list all sources used at the end of your document. Use your textbook or other library (or web-based) resources for information. **Do NOT forget to cite your sources!** Your work will be lowered by *one entire letter grade* if the source is missing and/or cited incorrectly or incompletely, so check with your friendly neighborhood librarian with any questions about citations. That's on the first review. If you also neglect to cite sources on the *second* review, then we will give you an F on the assignment. Make sure the websites are reliable, there's a lot of junk out there. **Be sure to cite websites properly, they must include the author, organization (if available), title, date last updated (if available), and date you accessed it.** Also cite anyone who may have helped you come up with ideas. It's perfectly fine (encouraged, actually) to discuss the issues with classmates and friends, just be sure that the work is your own in its entirety and that you cite the people with whom you worked. Lift the analysis from any source other than your own personal brain, and you're toast. It's very simple.
- 4) Every time you use a fact that you looked up you must include the citation in parentheses *at that point in the text where you use the fact*, as well as in a bibliography at the end of the paper. For instance, "Hawaiian lava is made of 50% SiO₂ (Hamblin and Christiansen, 2003)" is how you would acknowledge that you looked up the composition of lava in your textbook. You would also include the textbook in the list of works cited/bibliography at the end of the paper. In other

words, every fact you looked up should be documented and traceable *in the text*, not just as a list at the end of the paper without specific attributions. Footnotes are also acceptable for this purpose if you prefer to use them instead.

- 5) The review must be word-processed (nothing handwritten will be accepted), proofread, and spell-checked.
- 6) You must hand your review in *via* the **DIGITAL DROPBOX at our class Blackboard site**. This is accessed from <http://bb6.colgate.edu>; go to our Megageology S04 course, go to STUDENT TOOLS, and the DIGITAL DROPBOX option. If you need help figuring out how to work it, let one of us know. We'll also show you how to do this in class. **DO NOT** send us files by normal email, it clogs up the system and there is the risk that your assignment will be lost in the process. **The review is due no later than 7 days after the movie was shown.** For example, if the movie was shown on February 5th at 8 PM, then we must receive the review by February 12th at 8 PM. **NOTE: Late reviews will not be accepted without a valid excuse** (which means you arranged it with us at least 48 hours in advance). If you absolutely cannot get the digital dropbox to work (server is down, computer exploded, you were abducted by aliens and didn't have internet access), then either make sure that you or the aliens get the paper copy in by the same deadline, in our hands, one of our mailboxes (2nd floor of Lathrop, Geology Department), or one of our offices. Do not submit a paper copy if you can possibly avoid it, you run a great risk of it being lost. You can get help from SOURCE (the student computer help resource, on the web and also located in the O'Connor Campus Center/Coop or dial x7111 and ask for Blackboard help, this is the HELPLINE).
- 7) Do not write this in 4 minutes on your way to handing it in, because it doesn't take a rocket scientist to figure out how much effort you put into your work. Have fun with it *and* do high quality work. This should be taken as an entertaining thought exercise, a way to learn the course material better, a way to improve your grade, and a way to use your imagination. And besides, it does count as a significant part of your grade and doing a good job can contribute immensely to your success in the course. We emphasize the need to **PROOFREAD** your work before handing it in...nothing is more unimpressive than a sloppy document, and your grade will reflect your effort.
- 8) To get full credit you must watch the movie for its entirety. Relying on your memory from some time in the past when you saw the movie won't work very well unless you are oddly obsessed with it, and even then it's probably not in enough detail to do a good job on the reality analysis. If you miss the showing of the film, it will be on reserve at Case Library.

Extra Credit Opportunities

You may earn up to 50 additional extra credit points for this course throughout the term; if you get all 50 points, you will earn 5% of your final grade over and above the 100% listed above...earn 25 points and you'll get an additional 2.5%, you get the picture. Notice that an extra 5% of your final total can make a big difference in the final letter grade. Let us emphasize, however, that *you do not need extra credit to do well in the course*. Several opportunities for extra credit exist:

1) Attendance at any of the announced geology or science colloquium series presentations will count for 5 extra credit points; if you email one of us a brief summary and original question about the presentation you can get 10 points;

2) Writing an extra movie reality check review will count as 25 extra credit points, but you can only do ONE extra movie review, no more (there are only 3 films).

3) Bringing a current newspaper article about a geological event or phenomenon to our attention will garner you 5 extra credit points. The Tuesday NY Times section on Science is a good place to check for these.

4) Additional extra credit opportunities may arise during the course of the term, so stay tuned.

Participation and Attendance

Your participation grade is based on several different components. Atmosphere and morale in any class, even a large one such as this are affected by your participation, attendance, and attention during class time. If you are drowsy or inattentive in class, or if you are habitually or even occasionally late to or absent from class, your grade will be adversely affected:

- Students with more than three unexcused absences will be penalized by a lowering of their course grade by a full letter grade (e.g., A will become B, B+ will become C+, etc.); if absences are deemed excessive, students risk receiving an F in the course.
- Students who habitually come to class late or are drowsy or inattentive in class will be penalized by a lowering of their course grade by up to a full letter grade.

Some useful information: always handing in assignments, contributing actively to class discussions and activities, being alert and present at every class, asking intelligent questions in class, and keeping up on the reading are all excellent ways to guarantee you will get full participation credit. Not doing those things will pretty much guarantee you won't get full credit, and if you have a look at the grading scheme, you'll see this can have a significant effect on your final grade.

Here's another useful tidbit: if you have had a particularly rough night before class and think you will be having big problems staying awake and alert, don't hide in the back. Instead, sit near the front of the class. That way, you are letting us know that you are at least making a substantial effort to stay with us and be involved despite intense fatigue. As a result, you let us know you're doing your best and we will give you the benefit of the doubt instead of assuming otherwise.

You may obtain an excuse for missing class by contacting one of us in person, by phone, or by email if you will need to be absent (that means one of us must respond to you; just sending email or leaving voicemail without hearing from us doesn't work). Excused absences are of two varieties:

1) Classes missed due to illness or personal calamity. You may obtain an excuse by contacting one of us. Supporting documentation ought to be forthcoming from either the Health Center or the Dean of Student's Office.

2) Classes missed due to athletic or conflicting academic reasons. You will need to notify one of us *at least 48 hours in advance*.

It is not difficult to get an excused absence for the class; all we ask is that you be courteous and let us know ahead of time for things such as sporting events, other academic conflicts, family visits, and so forth. You must contact one of us at least 48 hours in advance for a valid excused absence (email, voicemail, or in person); if there is an emergency, simply

contact one of us as soon as you can, within reason. Deal with the problem first, don't worry about getting in touch with us until things have cleared up. Be advised, however, that such an excuse must be for a real problem, not an attempt to make up for an unexcused absence. We are very understanding but have zero tolerance for lying.

We expect you to be prepared for class each and every time we meet. This means carefully doing the readings assigned for that week. You should have finished the week's assigned readings before the class meets. Occasionally we will ask you to do work in class that relates to the readings, so it is critical that you keep up to date. This doesn't mean you should remember every single detail from the text; you should focus on the big picture. Please bring any questions that come up during your readings to class for us to discuss, anytime.

We also expect you to be alert and enthusiastic during class and to contribute to class discussions. Oftentimes we'll work in small groups, where we expect you to be an active participant.

Collaboration and Academic Honesty

This is very simple, really: we expect 100% academic honesty from each and every one of you. Don't cheat, don't make up information or sources, don't plagiarize, don't lift ANYTHING from books or websites no matter how apparently trivial, always cite sources for everything (that includes ideas, concepts, images, drawings...not just direct quotes) and don't help anyone do any of the above. We have *absolutely* no patience for anyone who cheats in classes in any way. Everything you hand in must be your own, original work; if someone helps you with your work, with proofreading, with ideas, then you *must* acknowledge them. We encourage you to work with other people, to bounce ideas off each other, to brainstorm, to read each other's work; all you have to do is acknowledge that person in the work you turn in. We expect you to adhere to the Honor Code and its spirit in its entirety: after all, it is only a description of honest and appropriate behavior. If you are unfamiliar with the concepts of the Honor Code, or plagiarism, or academic dishonesty, we encourage you to read the details in the Student Handbook (2003-2005), pages 74-77) and the pamphlet from the Dean of the College's Office "The Colgate University Academic Honor Code". We both take this very seriously and expect you to do the same. If you have any questions do not hesitate to discuss them with one or both of us immediately.

Exams must be taken without any communication whatsoever with other individuals (aside from us). You should feel free to ask either of us any questions, but any communication with other students or outside people is considered a breach of the exam conditions and will be dealt with accordingly. The exams will be closed book, closed notes.

Otherwise, we encourage you to work with other class members on assignments, reading and reality reviews. Science is about communication and brainstorming, don't hesitate to get others involved in your work. The only constraint, and this is a serious one, is that the work you hand in **is entirely your own**. If you had help or contributions of any kind from other individuals, you must cite their contributions in a list of sources (just list their name, then "personal communication", and the date of the interaction). Even if you collaborate with someone else on, say, a reality movie review, you must each turn in your own, independently written work. It is never acceptable to turn in a co-authored assignment. Similarly, any sources you consult in your work must be cited in their entirety. Use any accepted referencing system for the format.

And finally, a reminder....

HOW TO DO HIGH QUALITY WORK

The grades you receive for your work depend only in part on 'getting the right answer'. In fact, in this class, there often isn't a single answer, rather a few theories or ideas that you must weigh and assess; often, we are looking at natural systems that change on a daily basis. It is also very important that you communicate what you know clearly and effectively, and so your grade will depend on the form of your work as well as its content. Heed the following, terribly simple advice:

Do high quality work!

This may seem obvious! But what does it mean? The best advice we can give you is to avoid producing work in this or any course that looks like you are just going through the motions of something without knowing why except that you were told to do it, or hastily getting something done in time, or complying grudgingly with something that you are being made to do. Craft your work well. Plan and think before you write. Make your work both complete and precise: avoid vague generalizations and, whenever appropriate, include relevant details and show your logic and rationale. Make sure your tone and language are worthy of the occasion: scholarly and professional. Find a way to get into the spirit of things that is compatible with your basic nature. There are many ways to shine. Nevertheless, excellent work LOOKS excellent; mediocre work LOOKS mediocre. Some guidelines:

FORM:

- 1) Correctness. A basic issue is always the correctness of your Work: punctuation, grammar, spelling. Make sure your handwriting is neat and legible, and that word-processed writing has been spellchecked and proofread. If we can't read it or decipher it, how can we give you credit for it?
- 2) Accuracy and precision of language. A big problem many students have is the use of inaccurate and imprecise language. Avoid vague, cryptic, and colloquial language. It reflects both inadequate thought formulation and inadequate facility with vocabulary. Time and care can fix this problem. Or better yet, go to the writing center for help.

CONTENT:

- 3) Focus and relevance. Did you stay on one well-defined subject or fly off on tangents? Did you have a point or did you wander and ramble, as though lost?
- 4) Verisimilitude. Was your interpretation of the problem or issue reasonable or did it indicate a probable misunderstanding?

5) Preparation. Did your answer reflect adequate familiarity with the material we have studied, or did it look like you hadn't studied very much or paid attention in class?

If your work is weak in any of those ways, then it is hard to think of it as more than fair to mediocre in quality, and to give you more than about a C.

SOME QUALITIES OF EXCELLENCE: To get an honest and heartfelt B or higher for your work, it needs in addition to display at least some of the following qualities:

1) A sense of mission. Did you get the point of the exercise or the question? Or did you seem confused?

2) Deftness. Was the tail wagging the dog, or vice versa? Did you seem as if you didn't have a clue about what you were doing or why, or did you have things under control?

3) Insight. Did you see deeply into the issue? Did you have an original thought about it?

4) Awareness of context and significance. Did you indicate when and how the problem called for a larger understanding of the material as well as the various contexts in which it could be usefully viewed?

5) Subtlety. Did you seem to appreciate the depth and complexity of the issue? Or were your thoughts facile, superficial, poorly formulated, hasty, incomplete, etc.?

The Great Geological The Great Geological Film Series

The films will be shown at a variety of times and dates so as to accommodate everyone's complex schedules, so check the schedule carefully for dates and times. Owing to crises that will inevitably arise in obtaining these films, the schedule is subject to change. Don't forget, the reviews are in Blackboard's digital dropbox one week after the film is shown.

If you cannot make the scheduled time and you want to see that particular film, then you can check it out of Case Library at the Reserve Desk, watch it on your own, and hand in the review by the same deadline as the people who watched it at the official showing.

*****All movies will be shown in 209 Lathrop*****

Date and Time	Film
Wednesday, February 4 th , 7 PM	Journey to the Center of the Earth
Thursday, March 4 th , 9 PM	The Core
Monday, April 12 th , 8 PM	Dante's Peak

Tentative Schedule for Geology 105: MEGAGEOLOGY

Week	Date	Topic	Reading	Events
I	Jan. 19, 21	Introduction The Origin of Earth	Chapter 25 Chapter 1	
II	Jan. 26, 28	Earth Structure and Differentiation Magnetic field, seismic refraction	Chapter 1 and 3 Chapter 18	
III	Feb. 2, 4	Introduction to Plate Tectonics	Chapter 2 Chapter 17	“Journey to the Center of the Earth” Reality Review Movie showing 7 PM Wed. Feb. 4 th
IV	Feb. 9, 11	Introduction to Plate Tectonics Geologic Time I	Chapter 17 Chapter 8	EXAM I Thursday Feb. 12 th 7 PM
V	Feb. 16, 18	Geologic Time II Divergent Plate Boundaries I	<i>Chapter 8</i> Chapter 17 and 19	Mineral Lab (details to be announced)
VI	Feb. 23, 25	Divergent Plate Boundaries II Divergent Plate Boundaries III	Chapter 17 and 4	
VII	Mar. 1, 3	Divergent Plate Boundaries IV Continental Rifting I	 Chapter 17	“The Core” Reality Review Movie showing 9 PM Thurs. Mar. 4 th
VIII	Mar. 8, 10	Continental Rifting II Plumes I	Chapter 17 Chapter 22	
IX	Mar. 15, 17	Spring Break!		
X	Mar. 22, 24	Plumes II Subduction I	Chapter 22 Chapter 21	EXAM II Thursday March 25 th 7 PM
XI	Mar. 29, 31	Earthquakes Volcanism I	Chapter 21 and 18 Chapter 21 and 4	Rock Lab (details to be announced)
XII	Apr. 5, 7	Volcanism II Volcanism III	Chapter 21 and 4	
XIII	Apr. 12, 14	Volcanism IV Metamorphism	Chapter 21 and 4 Chapter 21 and 6	“Dante’s Peak” Reality Review Movie showing 8 PM Mon. Apr. 12 th
XIV	Apr. 19, 21	Mountain Building I Mountain Building II	Chapter 21 and 7	
XV	Apr. 26, 28	Atmosphere Origins of Life and Planet Habitability	Possible handouts	
	Finals Week	Final Exam		Final Exam

All readings are from our textbook, listed in the syllabus. Don’t forget: To get credit, a Reality Movie Review must be handed in within 7 days after the showing of that film, to Blackboard’s Digital Dropbox. Be sure to hit the SEND FILE option and not just upload the file.