

(DRAFT!) Geology in our lives:

What you need to know about Earth resources and the climate

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Overview:

This is an introductory geoscience course. There are no pre-requisites and no assumption of an existing knowledge of geology, although you are expected to be able to perform basic mathematical calculations. Newly-transformed as part of the College of Liberal Arts and Science Course Redesign Initiative, “Geology in our lives” will lead you on a journey through time to explore the interconnections between your life and the geology of Earth.

Course Goals:

In this class you will have the opportunity to practice and develop a number of skillsets and abilities. A few of these outcomes will be most important within the constraints of this classroom, but many will serve you well beyond this course and semester, in your life as an informed citizen and in tasks such as your future career. Ultimately, by practicing the skills and abilities we work on daily throughout the semester, our course goals are as follows:

1. explain potential impacts of geologic events on society and potential impacts of human activities on the Earth;
2. use your understanding of geologic processes in decisions that affect your daily lives, whether it has to do with house purchase, resource utilization, local waste disposal issues, school curriculum, or many other issues

You will have the opportunity to demonstrate to yourself and to us that you have achieved both of these goals during the final group project, due during the final exam period (more details to follow soon!).

Class Expectations:

The format for this course may be different from those you have encountered in other large classes, in that your role will be an active one- not a passive one, as in lecture-based courses. In-class time will involve work in assigned teams or pairs, activities that will ask you to think deeply and collect evidence to support a conclusion, whole-class discussions of complex ideas, and clicker questions that will ask you to weigh in on difficult problems you may not yet be sure how to solve. Outside of class, you will need to set aside time to read, work on take-home exams, collaborate with your team on self-guided trips around campus, and complete Weekly Checkpoints online.

Students new to this active learning approach sometimes find it uncomfortable, especially after many years of taking lecture-based courses. However, this active format results in nearly an entire letter grade increase in average student exam scores! In fact, students in lecture-based courses are 1.5x more likely to fail than students in an active-format classroom. These benefits are a result of the many opportunities for you to practice solving problems on a regular basis with the help of the instructor, TA, and your teammates- instead of alone the night before the exam.

The instructors and TAs in the course are working hard to generate an environment that helps you learn and provide opportunities for you to practice skills that will help you throughout your life. Remember that even though there is no lecture, we are in the classroom to guide you when you get stuck on a problem, help you

negotiate and understand new ideas, and even work with you to suggest outside resources, time management strategies, or ways of improving relationships with your team members.

While it may take you a few weeks or longer to get comfortable with the active format of this course, we expect that all students will bring a positive attitude to the classroom every day. Any student who is disruptive to their team or the class as a whole will be removed from the course at the instructor's discretion.

Team Policies:

This course will include abundant work in assigned teams. Research in university-level college science education demonstrates that groups that strive to work together will learn and accomplish far more than those that do not: Students with a more natural understanding or greater previous exposure to the relevant concepts benefit from the opportunity to teach others. Those who have difficulty benefit from discussing it with peers and having abundant opportunities to practice their skills and understanding and receive low-stakes feedback. Over the course of the semester you are likely to act as both a teacher and a student in your peer groups, and you will benefit from both roles.

The following guidelines will help your group achieve a smooth working relationship:

- Always be respectful and open to working with everyone in your group. Everyone brings a different background, level of interest, and set of skills to the group and task at hand. For everyone to feel comfortable contributing, all group members must be encouraging and helpful.
- Be willing to contribute even (or especially) if you are not sure of the value of your contribution. Often one person has a question that is shared by others, but no one wants to be the one to ask.
- Complete readings and assignments on time, and come prepared with questions and ready to explain what you have done and read to your group.
- Do not be late to class or plan to leave early. Your full contribution and attention to the class activities is valuable to your own learning and your group's experience!
- Set up a plan for contacting your group members and/or collaborating on outside work. We recommend exchanging phone numbers and emails, and utilizing free online tools such as Doodle Polls, Google Docs, GroupMe, or whatever technology works for everyone in the group.
- Review returned assignments. Make sure everyone on the team understands the feedback and how to do the activity.
- If a team member refuses to cooperate on an assignment, do not include that person's name on the assignment. If you do include a non-participatory member's name, this will be considered cheating in this course.

Grades:

Grades in this course will be based on a 1000-point scale, with points earned in the following ways:

- Activities and Homeworks - 250 points (10 randomly graded, 25 points each)
- Reading Circle Assignments- 250 points (10 randomly graded, 25 points each)
- Essays - 200 points (2 take-home essay assignments, 100 points each)
- Final Team Project - 150 points
- Weekly Checkpoints - 100 points (15 weekly checkpoints @ 5 points each; 1 syllabus quiz @ 5 points; pre and post exams @ 10 points each)
- I-Clicker Questions - 50 points

Final grades will be calculated as follows:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
≥ 930 pts	≥ 900 pts	≥ 870 pts	≥ 830 pts	≥ 800 pts	≥ 770 pts	≥ 730 pts	≥ 700 pts	≥ 670 pts	≥ 630 pts	≥ 600 pts	≤ 600 pts

		Topic	Due by class
INTRO	Tues., Jan 20	How do we evaluate science?	None
	Thurs., Jan 22	What is sustainability?	TBD
MINERAL RESOURCES	Tues., Jan 27	Where do minerals come from?	TBD
	Thurs., Jan 29	How do we use minerals in our daily lives?	TBD
	Tues., Feb 3	What are some impacts of mining?	TBD
	Thurs., Feb 5	How do we predict future mining use?	TBD
WATER RESOURCES	Tues., Feb 10	Where does our water come from?	TBD
	Thurs., Feb 12	How is water regulated?	TBD
	Tues., Feb 17	What are some impacts of our current water use?	TBD
	Thurs., Feb 19	How might current national and international water disputes be resolved?	TBD
ENERGY RESOURCES	Tues., Feb 24	How are fossil fuels formed and used?	TBD
	Thurs., Feb 26	What are some problems with fossil fuel reliance?	TBD
	Tues., March 3	What alternative energy options exist?	TBD
	Thurs., March 5	What are some problems with the alternative energies?	TBD
	Tues., March 10	Is the national energy debate more about resources or impacts?	TBD
	Thurs., March 12	Is the international energy debate more about resources or impacts?	TBD
BREAK	Tues., March 17	SPRING BREAK	TBD
	Thurs., March 19	SPRING BREAK	TBD

		Topic	Due by class
CLIMATE CHANGE	Tues., March 24	How did climate change impact past human societies and cultures?	TBD
	Thurs., March 26	What does climate variability look like?	TBD
	Tues., March 31	How are ocean-atmosphere climate patterns connected?	TBD
	Thurs., Apr. 2	How has climate changed in the past?	TBD
	Tues., Apr. 7	How might we adapt to climate changes?	TBD
	Thurs., Apr. 9	What changes are predicted for Kansas?	TBD
WATER RESOURCES	Tues., Apr. 14	How was global sea level changed in the past 40 years?	TBD
	Thurs., Apr 16	What changes has the Greenland Ice Sheet undergone recently?	TBD
	Tues., Apr 21	How does ice sheet mass loss impact the lithosphere?	TBD
	Thurs., Apr. 23	How and why does sea level vary globally?	TBD
ENERGY RESOURCES	Tues., Apr. 28	How are mineral resources and climate related?	TBD
	Thurs., Apr. 30	How are water resources and climate related?	TBD
	Tues., May 5	How are energy resources and climate related?	TBD
	Thurs., May 7	How are sustainability and climate related?	TBD