

GEOL 1120 002: Earth Resources

Spring 2020 Syllabus

Class Times and Location:

MWF 10:10–11:00 am, Brackett Hall 224

Instructor:

Dr. Emily Scribner

435 Brackett Hall

Office hours: MW 11:00 am – 12:30 pm

If these do not fit your schedule email me to schedule an appointment either in person or via Skype!

escribn@clemson.edu

I do my best to respond to all emails and Canvas messages within 24 hours; however, I will likely take longer to respond to communications sent after 5:00 pm or on the weekend.

Teaching Assistant:

Julia Corradino

jicorra@g.clemson.edu

Course Description:

The course provides a scientific view of the Earth and its contents as a dynamic resource base, which we must understand better in order to preserve it (where possible) and to use it wisely (in all cases). In this course students will learn the basic geology background that will help them to understand how and where geologic resources form and become concentrated enough to mine/quarry for our use. This information will be used to explore the environmental impacts of the mining, processing, and use of natural materials. We will build our discussions to the point where we consider how to alleviate some of the present resource-induced environmental problems and how to avoid similar problems in the future through directed technologies and public policies. Emphasis is placed on learning how to make accurate observations, how to use evidence to make (your own) or evaluate (someone else's) models of how things work, and how to be a “resource-aware citizen”. Students will practice writing coherently and informatively.

****This course fulfills a general education competency in Natural Sciences. This course has no prerequisites.**

Course Goals:

By the end of this course, you should be able to:

1. Explain the fundamentals of plate tectonics and the rock cycle.
2. Explain how fundamental geological, physical, and chemical processes form usable resources (minerals, metals, hydrocarbons).

3. Use basic geology principles to develop first order hypotheses on the location and distribution of specific natural resources (e.g., oil or copper deposits) on the planet, for exploration purposes.
4. Evaluate how changes in societal needs, for example population growth, affluence, and technology, change the use and needs for different natural resources and energy.
5. Explain the environmental and societal impacts of mineral resource use and possible means of remediation for varying types of pollution as related to earth resource use.
6. Evaluate and compare the benefits and drawbacks of the different types of energy generation, including their impacts on the environment and society.
7. Apply the principles of Geology and Earth Sciences to understand the formation, usage, and future availability of natural resources in a changing society, and to formulate basic hypotheses, evaluate data, and develop defensible conclusions related to the use of natural resources and energy.

Course Topics:

The following modules will be covered in this course:

This list is tentative and subject to change.

Module A – Basics of the Earth

- Population
- Plate tectonics
- Minerals
- Rocks and the rock cycle
- Ore and ore-forming processes

Module B – Mineral Resources and Mining

- Mineral resources: gold, silver, copper, platinum, diamonds, and colored gemstones
- History and current resource use
- Mining methods
- Resource conflict and control
- Environmental impacts of mining

Module C – Energy Resources

- Coal
- Conventional oil and gas
- Unconventional hydrocarbons
- Climate change and paleoclimate

Course Materials:

iClicker remote or iClicker Reef app

Notes: You will need to register your iClicker on Canvas to ensure you are receiving participation points. iClickers will not be loaned to students who forget to bring theirs to class.

There is no textbook for this course.

Course Website:

All course material will be posted on [Canvas](#). Log in to Canvas using your Clemson University user ID and password. From your Dashboard, select the course “S2001-GEOL-1120-002-20824”.

Course Grade:

Your course grade will be based on the following activities and assessments. Here is how your course grade will be calculated:

Activities and Assessments	Frequency	% of Course Grade
Participation (iClicker, in-class activities, etc.)	Every class	10%
Learning Objective Activities*	Monday 2/3, 3/2, and 3/30	30% (10% each)
Midterms	Friday 2/7, 3/6, and 4/3 in class	36% (12% each)
Final Exam	Tuesday 4/28 at 3:00 pm in our normal classroom	24%

*These assignments will be released one week prior to their due date.

Grades are calculated using the traditional 10-point scale:

A = 100–90%

B = 89–80%

C = 79–70%

D = 69–60%

F = 59–0%

Participation:

Participation and attending class are key to success in this course. You are expected to attend all classes and participate through the use of an iClicker, and participate in discussions and in-class activities. However, I understand that things may come up during the semester that prevent you from coming to class. For this reason, if you attend and participate in 90% or more of the classes I will change your participation grade to 100%. You do not need to email me to let me know you will be absent from a class unless you are seeking to be excused due to a university approved absence.

iClicker:

Answering multiple choice questions in class using your iClicker is one of the main ways your participation mark will be determined. You are only permitted to use your own iClicker in class. If you are caught using more than one iClicker (i.e., you are responding on behalf of other students in the class who are not present), both you and the owner(s) of the other iClicker(s) will receive 0% on your participation marks.

Learning Objective Activities:

The learning objective activities require each student to write a 250–500 word lesson on one learning objective from the material we have just, or are currently, covering. Your topic will be assigned to you. You will complete three of these activities throughout the semester. Rather than simply summarizing the material from our course notes, you will be expected to explain the topic in your own words, in a way that will help other students learn it. This assignment will require the use of reliable outside resources and proper citation of those resources.

The learning objective activities will be submitted to the Canvas Discussion Board so that all students in the class will have the opportunity to read and learn from them. Students are reminded that any postings made on Canvas should be professional and respectful.

Midterms and the Final Exam:

All exams will be delivered in class and will use a two-stage exam format. The questions on the exam will be based on the lecture-level learning objectives. All midterms are cumulative, but the new material will be weighted more heavily than material that has already been covered by a previous midterm. The final exam will be cumulative of all material and its coverage will be approximately balanced across all lessons.

Course Policies:**Professor is Late for Class:**

Please wait 15 minutes before leaving if I am late for class.

Late Assignments:

Accepted with a penalty of –10% per day that it is late. This penalty includes weekend days. Exceptions to this rule will only be granted in extreme circumstances. I may ask for written proof that explains why you were not able to complete the assignment by its due date. In-class activities, which count towards your participation mark, cannot be made up or completed late.

Grade Disputes:

If there is an issue with the grade you received on an assignment or exam, please discuss it with me as soon as possible. Grade disputes will not be considered more than 3 weeks after an assignment has been returned and/or after the final exam.

Missed Exams:

Make-up of a midterm or the final exam will only be granted due to university approved absences. If possible, please inform me before the exam occurs that you will not be able to attend and require a make-up exam. If it is not possible to inform me prior to an exam, all requests for a make-up exam must be made within one week (7 calendar days) from the date of the exam. I may ask for written proof that

explains why your absence was necessary. Once the midterms have been returned to the class, the make-up exam may consist of either different exam questions, or examination through a different medium (e.g., short answer questions, a short essay, etc.).

University Policies:

Academic Integrity:

The Undergraduate Catalogue states, “As members of the Clemson University community, we have inherited Thomas Green Clemson’s vision of this institution as a “high seminary of learning.”

Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form [including plagiarism].” Any instances of academic misconduct will be referred to Academic Affairs with the recommendation that the student receive an F on the assignment or examination.

Inclement Weather and Extenuating Circumstances:

Any exam that was scheduled at the time of a class cancellation due to inclement weather or other extenuating circumstances will be given at the next class meeting unless contacted by the instructor. Any assignments due at the time of a class cancellation due to inclement weather or other extenuating circumstances will be due at the next class meeting unless contacted by the instructor. Any extension or postponement of assignments or exams must be granted by the instructor via email or Canvas within 24 hours of the weather-related cancellation.

Accommodations for Students with Disabilities:

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the professor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848, by emailing studentaccess@lists.clemson.edu, or by visiting Suite 239 in the Academic Success Center building. Appointments are strongly encouraged – drop-ins will be seen if at all possible, but there could be a significant wait due to scheduled appointments. Students who receive Academic Access Letters are strongly encouraged to request, obtain and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student’s responsibility to follow this process each semester. You can access further information here:

<http://www.clemson.edu/campus-life/campus-services/sds/>.

Title IX (Sexual Harassment):

Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This policy is located at <http://www.clemson.edu/campus-life/campus-services/access/title-ix/>. Ms. Alesia Smith is the Clemson University Title IX Coordinator, and the Executive Director of Equity Compliance. Her office is located at 110 Holtzendorff Hall, 864.656.3181 (voice) or 864.656.0899 (TDD). Any instances of harassment or disruptive behavior towards others involved in this course (faculty, other students, etc.) will not be tolerated and will result in the student being dropped from the course.