GEOL 101: EARTH PROCESSES, RESOURCES, AND THE ENVIRONMENT

DEPARTMENT OF PHYSICAL SCIENCES, CONCORD UNIVERSITY, SPRING 2015

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Required Text:
•Merritts, D., Menking, K., and De Wet, A., 2014, *Environmental Geology – An Earth Systems Science Approach, 2nd ed.*
•Other readings for the course will be posted on Moodle. A mineral kit from the Bookstore is also required.

Catalog Description: Study of Earth systems and the geologic link between people and the physical environment. Emphasizes interactions among the lithosphere, biosphere, hydrosphere, and atmosphere. Topics include common minerals and rocks, plate tectonics, geologic hazards, water pollution, natural resources, and global environmental change. A General Studies Lab Science course. Three hours lecture, two hours lab or field. Prerequisites: None. Four semester hours credit.

Expectations: Ability to regularly attend class, take detailed notes, read and study a college-level textbook, and complete college-level laboratory work and homework assignments. "Eighty percent of success is showing up" – Woody Allen

Rationale and Purpose of this Course: Perhaps the greatest issues that will affect individuals and society during the 21st century are related to the availability of natural resources and the condition of Earth's physical environment. As the human population exponentially grows, non-renewable resources are depleted and important parts of the natural environment are altered. In short, resources, the environment, and human development seem to be at odds with one another. In order to evaluate these important issues, it is necessary to have an understanding of the processes that drive the Earth system. In the future, it will become increasingly important for both the average citizen and scientists to have a modern understanding of the nature of Earth processes and geological / scientific reasoning. This course is an introduction to the Earth for both science and non-science majors. The course examines the Earth as an integrated system focusing on connections between natural processes and different branches of science.

Semester Schedule:

Week	Reading	Lecture Topics	Lab Topics
Jan 12	Ch. 1 Ch 12(431-436)	Meet the Earth Some super-scary natural disasters If it can't be grown it must be mined Outer space and the origin of planets and exoplanets	Scientific reasoning & critical thinking
Jan 19	Ch. 2	Plate tectonics – What it's all about	Plate tectonics
Jan 26	Ch. 3	Faults, earthquakes, and societal risk	Topographic maps
Feb 2	Ch 4 (93-114)	**Exam 1** (Monday) Earth Materials – Minerals and rocks	Minerals
Feb 9	Ch 4 (114-134) + Moodle	Mineral resources – Where do they come from? Will we run out? Human use of resources from the Bronze Age to the Present	Igneous rocks
Feb 16	Ch. 5	Breath pipes and ignivomous mountains	Sedimentary rocks and fossils
Feb 23	Ch. 6	Why we know the Earth is >6000 years old	Metamorphic rocks
Mar 2	+ Moodle	**Exam 2** (Monday) Geologic history of West Virginia	**Field Trip** – WV Geology
Mar 9	Ch. 9	Surface water – Rivers, floods, wetlands, and resource protection	**Field Trip** – Outcrop analysis
		SPRING BREAK	
Mar 23	Ch. 10	Groundwater – Physical processes, resources, and environmental regulation	Groundwater maps
Mar 30	Ch 11(359-373) Ch 12(405-431)	Earth's atmosphere and oceans	Geology of the beach
Apr 6	Ch 13(457-485)	**Exam 3** (Monday) Petroleum – How does it form and how much is left? What's the deal with fracking and are there environmental impacts?	Petroleum deposits
Apr 13	Ch 13(485-495) Ch 13(495-516)	Coal – Geologic origin, resources, and politics Geothermal, nuclear, and renewable energy – practical?	How to read geologic maps (in a nutshell)
Apr 20	Ch. 14	Geologic record of climate change – natural and assisted	Glacial geology
Apr 27	Ch. 15	Impacts of climate change	Review
16		**Comprehensive FINAL EXAM** – look up time/day yourself	

Goals and Themes for the Semester:
1. To develop an integrated and interdisciplinary understanding of the nature of science and scientific reasoning.
2. To use an Earth systems science approach to examine solid-Earth processes and how these processes are related to processes in the atmosphere, hydrosphere, and biosphere.
3. To examine technological, societal, and environmental issues related to natural resources and natural hazards.
4. To develop and use critical thinking skills to investigate the nature of scientific inquiry.
5. To develop lab- and field-based skills related to geologic observation and description.

Instruction:

Instruction in this course will include lectures extensively supplemented by discussions, case studies, and miscellaneous activities (MA's) that require critical thought and analysis. Some MA's will be homework assignments, including problem sets and exercises requiring access to the internet (e.g., use of Google Earth). Lab work emphasizes observation, description, and scientific deduction. Writing is required throughout the course.

Grading: Final course grades will be weighted as follows:

Lab (equal weight per lab or lab quiz; lowest grade dropped)	25%
Misc. Assignments and lecture quizzes (lowest 3 grades dropped)	25%
Mid-term exams (3 @ 10 % each)	30%
Final Exam (comprehensive)	20%
	100%

Your final course grade will be determined by your total average score at the end of the course:

A	90-100%	Indicates superior performance and thorough understanding of class material
B	80-89%	Indicates good performance and above average understanding of class material
C	70-79%	Indicates average performance and an adequate understanding of class material
D	60-69%	Indicates below average performance or incomplete understanding of class material
F	<60%	Inadequate performance

Course Policies: (the fine print…)

•***Attendance:*** Attendance is strongly recommended for this lecture and is required for the laboratory. You must receive a passing grade in lab in order to pass the class. I really don't recommend skipping class, as some of the only people to have ever failed my class did so through routine absence. For additional information, see the Concord University catalog concerning attendance policies.

•***How to get an F or at best a D in this class***: I have been teaching for quite a while at four different universities, and empirical evidence suggests this can occur if you – Routinely miss lectures (see above), fail to buy/rent and/or read the textbook, read the textbook and study only on the day before the exams, fail to take any notes in class and don't bother to look at the slide presentations on Moodle in a timely fashion, frequently miss labs, and/or fail to do your own labs and homework and just pick up the answers from someone else.

• ***Special Lab and Exam Policy:*** You must be present for each exam or lab. Make-up exams are highly discouraged and will be considered for approval only with appropriate pre-notification. Approved make-up exams will be different than the original, and must be completed within 48 hours of the originally scheduled exam. Make-up exams will only be considered in the case of a written medical emergency or a University activity that I have *pre*-approved. Most labs require materials and instruction that will only be present only during scheduled lab hours. Your lowest lab grade is dropped from your final grade calculation; therefore, if you are ill or absolutely must miss one lab week, the zero could be dropped.

•***Syllabus Changes:*** Changes may be announced verbally in class at any time – You are responsible for such changes even if not in attendance.

•***Miscellaneous Written Assignments (MA's):*** Numerous short, in-class exercises, quizzes, and/or homework problems will be assigned throughout the semester (generally 1 to 3 per week). If you are absent for an in-class exercise or quiz (whether excused or unexcused), then you will receive a zero for the assignment. Please note, however, that the lowest 3 grades are dropped in order to account for 1 week of absence, excused or unexcused. Most of these will be graded on a 5-point scale as follows: 5 pts. -Excellent; 4 pts. -Mostly correct; 3 pts. -Could use some additional support for answers; <3 pts. Significant improvement required – see instructor for help!.

• ***Lecture Periods:*** Weekly textbook reading assignments should be read at the beginning of each week or before each week begins in order to maximize learning during each class or lab period. If you find yourself lost or confused during lectures, it is probably because you are behind in your reading. If this is not the case, however, please make an appointment to see me as soon as possible for study suggestions and help finding a tutor. I regularly offer study skills suggestions in class and at least one out of class workshop. I want you to succeed in college. Lectures will not necessarily follow everything in the textbook. The textbook is a supplement to lectures and is not a substitute for a good set of class notes.

• ***A note on cramming for exams****:* It is impossible to learn geology by reading the book the night before each exam. There is just too much specialized vocabulary. It is highly recommended that you follow a regular study and reading schedule in order to keep up with the material. As a general guideline, you should be completing 2 hours of homework and studying for each hour of instruction in class. I strongly suggest working the end-chapter review questions in your text as ungraded homework. There is a list of key terms that you should be prepared to define, a list of review questions to answer, and some additional thought questions. Some of these show up on your exams! You must have a good knowledge of specialized geologic terms in order to understand, solve, and answer exam questions.

• ***Late Labs and Assignments:*** Not accepted.

• ***Textbook****:* All students MUST own, borrow, or have rented a copy of the textbook for the semester.

•***Internet Requirements and Weather Guidlelines***: I will be using Moodle to offer lecture slides, notes, assignments, and anything else I find interesting. You MyCU login will grant you access to the website. As a general rule, you should check Moodle every day, even if not announced specifically in class to see if there are any updates (I usually communicate them through the Moodle Forum).

•***Inclement Weather***: I will use Moodle to communicate during weather closures and assign make-up work if the University is closed (closure does not mean classwork is cancelled).

• ***Special Needs/Disability Services****:* "Concord University is committed to responding to the needs of students with disabilities as defined by the Americans with Disabilities Act. Please inform your instructor at the beginning of the class semester if you have a disability and are requesting accommodations. It is your responsibility to self-disclose that you are requesting accommodations. The University and instructor will provide you with a reasonable accommodation. You should register with CU's Disability Services Office, located in the Athens campus Jerry and Jean Beasley Student Center, Bottom Floor, across from the Campus Post Office. The Disability Services Office phone is 304-384-6086 or you can email the Disability Services Coordinator, Nancy Ellison, at nellison@concord.edu for assistance."

• ***Disallowed in Class:*** Cell phones, iPods, and other electronic devices, other than a calculator. Photography and internet use is not allowed during exams: **If you are found utilizing the internet, a phone, or a camera during an exam, you will be expelled from the exam with a grade of zero, and will face charges of academic dishonesty.**

• ***CU Honor Code*****:** "As a member of the Concord University Community I will act with honesty and integrity in accordance with our fundamental principles and I will respect myself and others while challenging them to do the same." **Your enrollment in this course indicates that you have accepted and agree to abide by the principles of this code.**