GEOL 111-Physical Geology

Objective: The purpose of this syllabus is to guide the participant in the requirements, demands, logistics and expectations of this course.

Getting Help:
To receive technical assistance on issues related to WebCT contact:

Academic Instructional Technology Help Desk
ES 102
Spring and Fall Semester: Monday-Thursday 8:00 a.m. - 9:00 p.m. Friday 8:00 a.m. - 5:00 p.m. MDT/MST Summer Semester: Monday-Friday 7:30 a.m.-4:30 p.m. MDT
(719) 587-7371
ascwebct@adams.edu

Instructor Information

Instructor: Dr. Robert G. Benson
E-mail: rgbenson@adams.edu (use GEOL 111 Ex St in the subject line when contacting the instructor)
Phone: 719.587.7921
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Address:

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208 Edgemont Blvd.
Alamosa, CO 81102
Website: http://faculty.adams.edu/~rgbenson

Welcome from your instructor

Thank you for taking on this challenging course, a course that will develop your ability to look at the physical earth in a new light. Awareness of *geology*, the study of the earth we walk on, use, and sometimes exploit, is as important to our everyday lives as any other aspect. However, the role of geology is often poorly understood and appreciated, until earthquakes shatter cities, tsunamis impact humanity, volcanic eruptions cover crops and towns, rivers jump their banks and flood, and natural resources become rare and expensive. On successful completion of the course, you will be able to assess media reports on geological events, make informed decisions about geology and its impact on you, and have a much deeper appreciation of the earth as a whole.

Geology is a very *interdisciplinary* science, drawing on the studies of mathematics, chemistry, physics, and biology to unravel the stories contained in the rock record, stories of ancient climates and life, vast glaciers and deserts, formation of valuable resources, stunningly large

volcanic eruptions, and many, many other events. Knowledge of these past events can help us understand the past and better prepare us to live with future repeats of similar events.

Geology is a scientific investigation of the Earth's components, guided by the scientific method of inquiry, theorizing, and testing. Geologists often rely on prediction, observation, and discovery more than experimentation and incorporate much from other sciences. Geologists many years ago tended toward hard-rock and soft-rock areas of specialization. The modern geologist is usually far more synthetic in nature, crossing many subdisciplines, such as paleontology, petrology, structural geology, geochemistry, field geology, geographic information systems, and others to focus on deciphering a geological puzzle or theory.

My personal journey with geology began in grade school, when I was about 10 years old, asking questions and finding answers about the bands of pale gray-green rocks that cross the pink coastal granite where I fished, swam, and played. Soon I was asking questions about glacial erratics found in the woods. This curiosity continued through high school and into college where I became fascinated with the unique complexities of ore deposits. I completed my Bachelor's degree in geology at the University of Washington, and started geologic work in Alaska. On returning from Alaska, I completed a Master's degree in economic geology at the University of Idaho. After graduation, I found work in precious metals exploration, development, and production in Nevada. More of the same work brought me to Colorado, where after about 5 years, I returned to school, and completed a doctorate at the Colorado School of Mines in economic geology with a minor in environmental science. I joined the faculty at Adams State after graduation from Mines and am in my 13th year of teaching.

This course will be challenging but enlightening, and I hope you will immerse yourself wholeheartedly in learning. Remember I am here to help guide your learning. Please contact me if you need suggestions on how to proceed.

Sincerely,
Dr. Robert Benson, Ph.D.
Associate Professor
Biology and Earth Sciences

Important Information for Your Success in this Class

In order to facilitate the efficient completion of this course to off campus students please be certain to read carefully ALL the instructions provided in the course Study Guide provided by Extended Studies. In particular, pay close attention to the following:

1. Note well that, in the interest of presenting the same learning opportunity to all students, there are ABSOLUTELY NO EXCEPTIONS made to any established policies, procedures, and deadlines as articulated explicitly in the Study Guide/syllabus for the course.
2. Success in this course, when delivered via the Extended Campus, requires significantly **more** diligence on the student's part than when taken in a traditional classroom setting.

Sufficient and reasonable time is essential in order to provide for the student to assimilate the material, email transit time, scoring of assignments, and instructor feedback in order to improve student learning and increase the probability of successful completion of the course.

3. A MINIMUM of twelve weeks, and a MAXIMUM of one calendar year (from the enrollment date) is the established time frame available for completion of the course. **There will be NO EXCEPTIONS.**
   Students are strongly discouraged from attempting to complete the course in an abbreviated time frame (*e.g.*, in order to meet some deadline), since this is not consistent with a reasonable probability of passing the course.
4. All assignments, except specific written papers, should be submitted via the WebCT portal. I attempt to score all materials submitted within one week of receipt. Each assignment should be submitted as one file in PDF format. Some work may be submitted via TurnItIn.com. Submit all material in a professional format. If work is faxed to me in disarray, multiple files and formata, or I cannot read scanned material, your grade will reflect this level of work.
5. Communication with me, and submission of course materials (other than examinations) is most efficiently accomplished via e-mail, and is highly recommended. I am often in the field, and have better access to email than regular mail.
6. As stated explicitly in the Study Guide/syllabus, all assignments MUST be submitted PRIOR to requesting and taking the examination covering the associated material. Any assignments submitted after the corresponding examination has been taken will NOT be accepted and will be assigned a score of zero points.
7. Examination requests must be emailed to me, not to Extended Studies, at the address given and using the form provided at least one week BEFORE you plan to take the exam. ONLY ONE examination may be requested and administered per week. There will be NO EXCEPTIONS.

If you have any questions, please do not hesitate to contact me.

Credit Hours

4

Prerequisites

None

Required Textbook and Laboratory Materials

To order textbooks or obtain information about book titles you may go to www.exstudies.adams.edu and click on the "ASC Bookstore" icon.

Use **Section Number: 1101** to order books from Bookstore site.

Grotzinger, J., Jordan, T.H., Press, F., and Siever, R., (2007). *Understanding Earth*, (5th ed.). W.H. Freeman and Company. ISBN-10: 0-7167-6682-5

This course includes a **required** laboratory component which you must complete by using a self-contained study kit, **LabPaq GK-1**. While this kit may seem a little expensive, note that the cost of the kit includes the lab manual and all of the materials you need to complete the labs, outside of some everyday household items. If you are a teacher, or teacher candidate, you will find the material contained in the lab package to be especially useful to you in your classroom. After you are certain you intend to complete the course, order your LabPaq directly online at http://www.labpaq.com/product-overview/geology-overview-page. Keep your sales order number and supply it to me as proof of purchase. LabPaqs are shipped from Denver usually within 24 hours. If you don't purchase the lab materials and complete the lab component, you will not be able to pass the class. The title of the manual included in the LabPaq is:

Riegel, T. R., 2006, Laboratory Manual of Experiments for the Independent Study of Physical Geology, accompanies Hands-On-Lab LabPaq GK-1

Catalog Description

Physical Geology is an introduction to the materials of the earth and the internal and surficial processes that have acted upon the earth through time. Laboratory work includes identification and classification of minerals and rocks, and exercises involving topographic and geological maps.

The Physical Geology course consists of 17 lessons, 3 midterm exams, a final exam, and a self-guided field trip. Each lesson has paired and complementary text and laboratory exercises. Learning Objectives are provided for each lesson in order to assist students in identifying what information and concepts should be mastered.

Student Learning Outcomes

Upon successful completion of this course, the student will be able to:

- define/articulate earth science concepts and definitions such as geologic time, uniformitarianism, superposition;
- describe the basic components and interrelations of the rock cycle;
- demonstrate/articulate a basic knowledge of how continents and mountains are formed and how they become deformed;
- interpret landscapes and describe to others what surficial processes are responsible for the landforms they see (i.e. how running water, wind, and ice transform the surface of the earth);
- describe important geologic structures; and
- be able to identify important rock-forming minerals.

Course Requirements

Each lesson involves some or all of the following activities:

- assigned chapter readings from the textbook, Grotzinger, et al, 2007, *Understanding Earth*
- completion of question sets
- associated laboratory exercises, from Reigel, 2006, *Laboratory Manual ofExperiments for theIndependent Study ofPhysical Geology*
- other materials as required.

In addition to the above, four exams will be given. The first three exams will be mostly over material covered since the last exam, although some previous material will be covered. There will be a one-hour time limit on these exams. A two-hour comprehensive final exam will be given.

This course is intended to provide students having little or no scientific background with a balanced and realistic perspective of geology. The course emphasizes the interdisciplinary nature of geological problem solving.

Grade Distribution and Scale

In alignment with ASC academic policies, no D may apply to a major or minor field.

Grade Distribution:

17 text and lab units	variable points	1725 points
1 field trip report	600 points	600 points
3 proctored midterm exams	200 points each	600 points
Proctored comprehensive final exam	400 points	400 points
	Total Points	3325 points

Grade Scale (earned points to grade equivalent):

90-100%	A	>2992 total points
80-89%	B	2660-2992 total points
70-79%	C	2328-2659 total points
60-69%	D	1995-2327 total points
59% and below	F	$\leq$ 1994 total points

Grades will be determined on the basis of objective, performance-based criteria. That is, letter grades will be assigned on the basis of the percentage of total available points earned.

The following rubric will be used to establish your grades on assignments:

CRITERIA	POINT VALUE	POINTS EARNED
Test and lab units		
All questions answered in a clear organized style Supporting drawings clearly labeled	10	
Questions answered completely and thoroughly	90	
Additional written material		
All questions answered in a clear organized style Supporting drawings clearly labeled	10	
Questions answered completely and thoroughly	60	
Original thought and insight demonstrated	20	
Reference list with citations properly formatted	10	
Direct inclusion of electronic internet resources	-10	

Course Instructions

Learning On-Line:

Many Websites are listed in your text and lab book. Good internet research skills are a useful asset. Please contact your instructor if you do not have Internet access to discuss alternative arrangements.

Assignments:

Completed lessons **must** be submitted in the following format:

NAME (be sure to put this on each page)
Lesson number
Date (your choice of format)

1. **(copied, typed, or written-out text of question)**

   Text of answer

2. **next question**

   Answer, etc.

Lab materials must be submitted in the format specified in the laboratory assignment, and included with the text book exercise in a single PDF document.

Example of assignment style:

Rob Benson
Lesson 1 Exercises
1 JAN 06

1. **What are the two basic subdisciplines of geology?**

   Historical and Physical Geology

Completed assignments for each lesson are to be sent through the WebCT portal. If you have questions, refer to the contact information included in the syllabus. Completed assignments must be a single package of work. Do not send in multiple parts of lessons in different formats. I will grade the first part of the assignment received. Any subsequent material related to that assignment will not be counted**.**

Students are **required** to complete work in a typed format using a standard word processing system such as Microsoft® Word or WordPerfect®. **You must submit work in PDF format. This reduces both file size and preserves formatting better. Note that this may require scanning lab worksheets or other supporting material. Nearly all word-processing systems have the means to make PDF conversions.** You may wish to experiment with copying some required lab materials from the laboratory manual CD (Riegel, 2006). For scanned work , please consider that scanned images are often very large, and can be difficult to submit via e-mail. Material should be scanned at the lowest possible resolution for e-mail submission.

All lessons and their associated assignments must be completed and received by the instructor **prior** to submitting an Exam Request Form to the instructor for the *corresponding* examination. **DO NOT** send all of the assignments, and then ask for the exams. **This is not negotiable.**

Examinations

There will be three midterm examinations and a comprehensive final examination. Please refer to the Guidelines for Proctored Exams and submit your exam request to the instructor after completion and submission of the relevant lessons to the instructor and one week before you plan to take the exam. Generally the turnaround time on exam requests is less but do not count on anything faster.

Suggestions For Effective, Efficient Studying And Course Completion

Do not expect to sit down and do this course in less than 12 weeks. Note that this is a variation on the standard Extended Studies policies. Please follow the course sequence exactly. You are investing time and money in learning, get the most of it.

Read the introductory paragraph of each chapter when using the text or lab manual. Examine each of the figures and captions. Read the summary section at the end of each text chapter, and the *Key Terms and Concepts*. After doing this, re-read the chapter. This approach will allow you to see the overall structure of the textbook chapter, especially the important new concepts, and the repetition will reinforce your new knowledge. Always read the introductory material in the text or lab manual before doing the exercises. There are no trick questions in any of the lab or lecture materials, but all will require slightly different ways of thinking for discovering solutions. This is, after all, exactly what learning is about, and the satisfaction of gaining new skills and knowledge about the world is an important part of gaining knowledge.

If you have any particular problems with the assigned work, please contact me before you submit your work for grading. I cannot return work for correction and resubmittal. I will always assume you are doing your best to learn as much as you can the first time around.

Departmental and College Policies

- The instructor will strictly adhere to all policies established by the Office of Extended Studies.
- All coursework must be completed within the allotted time as established by the Office of Extended Studies.
- Examination requests should NOT be made until all lessons and associated assignments/laboratory exercises have been completed and received by the instructor. Once an examination has been requested, all lessons and associated exercises not previously completed will no longer be accepted and will be assigned a score of zero.
- Academic honesty *(i.e.*, individual efforts on all exercises) is mandatory. Plagiarism, cheating, fabrication, or falsification of laboratory data, etc., will not be tolerated. Any offense will result in a zero for the exam or exercise in question and may result in failure of the course. Please refer to *ASC Student Handbook.*
- All challenges or recalculations of examination or final course grades must be documented by the student with appropriate paperwork, and must be brought to the attention of the instructor within the first week following the course completion date (i.e., one year after the course begins or a final grade is submitted). After these deadlines, grade changes will not be considered.

Course Outline and Overview

Lesson	Description	Text readings	Laboratory readings	Additional Comments	Lesson Points
•	The Earth System	*Grotzinger, et al,*	START: Riegel, *Laboratory 1 (will be*	• Self study of the course	**150**

		Chapter 1	*started, now, but completed in Lesson 3);* START *and* COMPLETE: Riegel, *Laboratory 11*	goals, assessment and schedule. • Review pages 5 through 26 in Riegel • Send the sales order number of the LabPaq purchase. • Local geology paragraph	
•	Plate Tectonics	*Grotzinger, et al,* Chapter 2	Riegel, *Laboratory 15*		**100**
•	Earth Materials	*Grotzinger, et al,* Chapter 3	Riegel, *complete and finish Laboratory 2 and finish 1*		**125**
•	Igneous Rocks	*Grotzinger, et al,* Chapter 4	Riegel, *Laboratory 3*		**100**
•	Sedimentation	*Grotzinger, et al,* Chapter 5	Riegel, *Laboratory 4*		**100**
	MIDTERM I				**200**
•	Metamorphism	*Grotzinger, et al,* Chapter 6	Riegel, *Laboratory 5*		**100**
•	Deformation	*Grotzinger, et al,* Chapter 7	Riegel, *Laboratory 13*		**100**
•	Geologic Time	*Grotzinger, et al,* Chapter 8	No lab assigned		**75**
•	Volcanoes	*Grotzinger, et al,* Chapter 12	No lab assigned, see Lesson 10		**75**

•	Earthquakes	*Grotzinger, et al,* Chapter 13	Riegel, *Laboratory 14*		**125**
	MIDTERM II				**200**
•	Earth's Interior	*Grotzinger, et al,* Chapter 14	Riegel, *Laboratory 12*	Be sure to look at the field trip requirements	**100**
•	Groundwater	*Grotzinger, et al,* Chapter 17	Riegel, *Laboratory 7*		**100**
•	Streams	*Grotzinger, et al,* Chapter 18	No lab assignment		**75**
•	Deserts	*Grotzinger, et al,* Chapter 19	No lab assignment		**75**
•	Coastlines and Oceans	*Grotzinger, et al,* Chapter 20	Riegel, *Laboratory 10*		**100**
•	Glaciers	*Grotzinger, et al,* Chapter 21	Riegel, *Laboratory 8*		**100**
•	Weathering, Erosion, and Mass Wasting	*Grotzinger, et al,* Chapter 16	Riegel, *Laboratory 6 and Laboratory 9*		**125**
	MIDTERM III				**200**
•	**FIELD TRIP REPORT**				**600**
	FINAL EXAM				**400**

Text work submitted without associated lab assignments or *vice-versa* will result in a zero for the whole assignment.

Technical Requirements

A complete overview of the technical requirements, software for this course and WebCT tutorials is available in the Student Support Module, located in the Course Content tab. Information for receiving technical assistance is also included.