



Rensselaer

Course Syllabus

Course Title:	Introduction to Geophysics
Course number:	ERTH-2100-04
Credit hours:	4
Semester/ year:	Spring/2012
Meeting days:	Lecture: M/R 2-3:50
Room location:	J-ROWL 3W13
Lab/discussion session location:	N/A
Webpage:	http://www.rpi.edu/~roecks/Geophys.html
Prerequisites or other requirements:	None, but 1st year Physics strongly suggested
INSTRUCTOR:	Steven Roecker/Professor
Office location:	J-ROWL 2C04
Office telephone number:	x6773
Office hours:	Wednesday 1-3
e-mail address:	roecks@rpi.edu
Teaching Assistant name(s):	None
TA office location:	N/A
TA office hours:	N/A
TA e-mail:	N/A

Course description:

The purpose of this course is to introduce the basic concepts involved in applying physics to understand the Earth. We will also discuss fundamental techniques of geophysical data collection and analysis. We will cover the fundamentals of Gravity, Seismology, Geochronology, Heat Flow, Electromagnetism, and Geodynamics as they apply to the Earth. We will optionally (as time allows) discuss GPS and InSAR geodetic techniques near the end of term.

Student Learning Outcomes

This course will teach students a range of knowledge and skills. The knowledge and skills acquired are the learning outcomes of this course and a representative subset of them are listed below:

1. Students will be able to analyze Gravity observations
2. Students will be able to interpret refraction Seismological data.
3. Students will be able to interpret fundamental Geochronological isotopic ratios
4. Students will be able to solve basic problems in Geothermal Heat Flow
5. Students will be able to analyze resistivity observations.
6. Students will be able to apply basic applications in Geodynamics.

Course texts: Fundamentals of Geophysics
 William Lowrie
 Cambridge University Press

Grading criteria

Grades will be based on performance in class participation, homework, and exams. There will be 2 exams (one during the term and a final on the last regular day of class). Exams are cumulative and can cover all previous material from lecture and readings, although most of the questions will be on material covered since the previous exam. Weights used in calculating the final grade are assigned as follows:

Homework	50%
Exams (2)	45%
Participation	5%

How to calculate your grade at any time during the term

Using the percentages shown in the table above, you first compute your current percentage. To do so, let

SUMQ	be the total sum of all possible points on Homework given thus far
MYSUMQ	be the total sum of all points that you have accumulated on the Homework.
SUME	be the total sum of all possible points on Exams given thus far
MYSUME	be the total sum of all points that you have accumulated on the Exams.
SUML	be the total sum of all possible points on Participation given thus far
MYSUML	be the total sum of all points that you have accumulated from participation.

Then, your current percentage can be calculated from the formula:

$$\text{MYPERC} = 100 * [(\text{MYSUMQ}/\text{SUMQ}) * 0.5 + (\text{MYSUME}/\text{SUME}) * 0.45 + (\text{MYSUML}/\text{SUML}) * 0.05]$$

With the exceptions noted below, your current grade is estimated from the following binning:

MYPERC	Estimated Letter Grade
Greater than 90%	A
Between 80% and 90%	B
Between 70% and 80%	C
Between 60% and 70%	D
Less than 60%	F

Plus and minus grade modifiers apply to the upper, middle, and lower bins within the percentage range (e.g., 81% would be a B-, 88% would be a B+). For example, suppose Fred Flintstone scored 13/15 and 12/15 on two homeworks, 60/69 on the first exam, and participated in 80% of the classes he attended thus far. Fred's current percentage would be

$$100 * [(25/30) * 0.5 + (60/69) * 0.45 + 0.80 * 0.05] = 84.8\%$$

so Fred currently has a solid B in the class.

Modifications

The final grade will be based on a curve, and that curve *ALWAYS* lowers the cutoffs on the letter grades. Where exactly that cutoff will eventually wind up will depend on the performance of the class throughout the term (along with some consideration of the performance of previous classes), **BUT** you can be sure that your grade will **NEVER** be **LOWER** than what is indicated in the table above. For example, if you wind up with an 80% score, you are guaranteed a B. Moreover, while Fred's current score is a guaranteed B, it may eventually become an A.

Course calendar:

NOTE: This is a tentative schedule and subject to change depending upon the progress of the class.

Week 1: Overview of course and requirements
General Review of Key Concepts

Week 2: Gravity I

Week 3: Gravity II

Week 4: Gravity III

Week 5: Seismology I

Week 6: Seismology II

Week 7: Seismology III
EXAM

Week 8: Spring Break

Week 9: Geochronology

Week 10: Geothermodynamics

Week 11: Geoelectricity

Week 12: Geoelectricity/Geomagnetics

Week 13: Geomagnetism

Week 14: Geodynamics

Week 15: Geodynamics/Geodesy

Week 16: Geodesy/EXAM

Attendance policy:

Attendance at lecture is not required but is strongly recommended.

Other course policies:

Late homeworks will be penalized by subtracting 20% of the total value per day (including holidays and weekends). Thus, any homework more than 4 days late gets no credit. Note that a "day" is considered over at 5PM. If your homework is not delivered to me or in my mailbox by that time it will be docked an extra day.

Missed exams/quizzes may be retaken only if the instructor is satisfied with the reasons given by a student for being absent from the exam/quiz. If a student has an unavoidable conflict of significance which he/she knows about in advance of an examination he/she **MUST** notify the instructor prior to the day of the exam. In cases of emergency (e.g., health problems) the student **MUST** provide sufficient evidence of the emergency (e.g., a note from a doctor) to the instructor before any action will be considered. Exams will be retaken only at the discretion of the instructor.

A Few Extra Words of Advice

1. Pay attention to the material in the lectures (in class and on-line). Don't just go by the book.
2. Excuses always sound better if they are made **BEFORE** something is due.
3. The student is responsible for knowing what goes on in class. If you miss some part of class, you need to find out what happened. Talk to a friend, talk to the instructor, or check the web site.

Academic integrity

Student-teacher relationships are built on trust. For example, students must trust that teachers have made appropriate decisions about the structure and content of the courses they teach, and teachers must trust that the assignments that students turn in are their own. Acts, which violate this trust, undermine the educational process. The Rensselaer Handbook of Student Rights and Responsibilities define various forms of Academic Dishonesty and you should make yourself familiar with these. In this class, all assignments that are turned in for a grade must represent the student's own work. In cases where help was received, or teamwork was allowed, a notation on the assignment should indicate your collaboration. Submission of any assignment that is in violation of this policy will result in the student receiving a failing grade for the class. If you have any question concerning this policy before submitting an assignment, please ask for clarification.