Environmental Geophysics, Geology 380-01

CRN: 708
Credits: 3.0
Lecture meets: M, W 1:00-1:50; 205 Science 1 Building
Lab meets: W, 2:00-3:50; 205 Science 1 Building
Prerequisites: GEOL 115 or GEOL 120 or GEOL 150 or GEOL 182, and MATH 173, and PHYS 103 or PHYS 203.
GenEd2 Attribute: LA

Instructor

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Textbook *(required): Introduction to Applied Geophysics, Exploring the Shallow Subsurface*; Authors: H. Robert Burger, Anne F. Sheehan, and Craig H. Jones, W.W. Norton & Company, New York. Date Published: 2006. ISBN: 0-393-92637-0; or 978-0-393-92637-8.

This course uses **Angel** (https://angel.oneonta.edu/) to transmit information such as the syllabus and lecture schedule, lecture notes, and exercises. You will use your SUCO email ID and password to access course information on Angel.

SUNY Oneonta Course Description: The application of physical principles to the investigation of the earth; field work will include the use of the magnetometer, gravimeter, seismometer, and resistivity unit.

Course Overview The course examines the use of geophysical techniques to elucidate geologic features in the subsurface. A significant part of the course involves practical applications of geophysical tools, which include a gravimeter, seismic refraction array, electro-magnetic induction profiler, ground penetrating radar, electrical resistivity, and differential GPS. Students will learn how to design, set up, and execute field surveys. Students will gain exposure to data management and analysis, including signal processing and georeferencing.

Student Learning Outcomes for the Geology program, satisfied by this course

- Students will demonstrate understanding of processes that occur on and within the Earth and interactions among Earth's systems. (GEOL-SLO #5)
- Students will demonstrate their ability to collect and analyze geologic information in field and laboratory settings. (GEOL-SLO #6)
- Students will demonstrate their understanding of how geologic processes and materials intertwine with societal needs. (GEOL-SLO #7)
- Students will demonstrate their ability to apply scientific reasoning and technology to solve geologic problems. (GEOL-SLO #8)

- Students will demonstrate their ability to work collaboratively to solve geologic problems (GEOL-SLO #9)
- Students will utilize scientific methods to design and execute research projects that include collection, analysis and interpretation of data. (GEOL-SLO #10)
- Students will demonstrate their ability to communicate scientific and technical information effectively through appropriate oral, visual and written presentation. (GEOL-SLO #11)

Course Goals

- Students will develop skills in setting up geophysical surveys.
- Students will learn the underlying physical properties of Earth which can be probed by the various applied technological tools for geophysical surveys.
- Students will learn the useful range of detection for various geophysical techniques.
- Students will develop expertise in collecting field data and writing scientific reports.

Grading

Grades will be based on evaluations of field projects, lab exercises, and a final exam.

Field Projects and Lab Exercises. There will be several field projects in this course which will usually have a write-up/exercise associated with it. There will also be lab exercises for times when we don't have a chance to get out into the field.

All exercises must be handed in by the due date. Late work will be marked down exponentially, with a decay rate of -0.25 per day. The equation is , where $G(t)$ is your grade after it has decayed over time, G_0 is your grade if you submit your work on time, λ is the decay rate, e is Napier's constant (2.71828), and t is time in days.

Exercises evaluated by a rubric will be rescaled to the University curve given below. In general, major grade boundaries for rubric evaluations are A > 85% > B > 65% > C > 45% > D > 25% > E.

Final Exam. The final exam is cumulative, and will draw extensively from the lab and field exercises, and from lecture material. Questions will be in the form of short answer essays.

Here's the breakdown on grading:

75% Field Projects and Lab Exercises
25% Final exam
100%

Final grade assignments will be guided by the standard University curve given below.

Percent	*Grade*		*Percent*	*Grade*		*Percent*	*Grade*		*Percent*	*Grade*
93-100	A		87-89.9	B+		77-79.9	C+		67-69.9	D+
90-92.9	A-		83-86.9	B		73-76.9	C		63-66.9	D
< 60	F		80-82.9	B-		70-72.9	C-		60-62.9	D-

Schedule (*this schedule is subject to change if more time is required*).
Lecture meets MW, 1:00-1:50; Lab meets W 2:00-3:50

Week	**Monday**	**Wednesday**	**Wednesday Lab**
Jan 17-19	No Class	Course Overview	Read the Gravimeter
Jan 24-26	Intro to Geophysics	Earth's properties	Gravity Corrections
Jan 31- Feb 2	Gravity, Ch. 6	Gravity	Buried Objects
Feb 7-9	Gravity modeling	Buried Objects	Gravity modeling
Feb 14-16	Gravity modeling	Gravity modeling	Gravity modeling
Feb 21-23	**Spring**	**Break**	**NO CLASS**
Feb 28-Mar 2	**NO CLASS**	GPS	GPS
Mar 7-9	E-M of Earth, Ch. 8	EMI Survey	EMI Survey
Mar 14-16	EMI	EMI	EMI
Mar 21-23	GSA-No Class	EMI	EMI
Mar 28-30	GPR	GPR	GPR
Apr 4-6	GPR	GPR	GPR
Apr 11-13	Seismic, Ch. 2-3	**FT**: Refraction, Ch. 3	Refraction Project
Apr 18-20	**Spring**	**Break**	**NO CLASS**
Apr 25-27	**NO CLASS**	**FT**: GPR	GPR Project
May 2-4	Group Projects	**FT**: Group Projects	Group Projects
May 9-11	Group Projects	Group Projects DUE	Final Exam Review
May 16	Final Exam 11:00am-1:30pm		

Spring 2011 Calendar

January 16-18	Sunday-Tuesday	New student arrival & orientation
January 19	Wednesday	Classes begin
February 18	Friday	College closes after last class
February 28	Monday	Classes resume
April 15	Friday	College closes after last class
April 26	Tuesday	Classes resume
May 11	Wednesday	Follow Monday class schedule
May 12-18	Thursday-Wednesday	Finals
May 21	Saturday	Commencement

Final Exam Week Class Schedule May 12 - 18, 2011

Date and Time	Thursday May 12	Friday May 13	**Monday May 16**	Tuesday May 17	Wednesday May 18
8:00am-10:30am	10 Tu Th	10 MWF	9 MWF	8 Tu Th	8 MWF
11:00am-1:30pm	4 Tu Th	2 MWF	**1 MWF**	2 Tu Th	3 MWF
2:00pm-4:30pm	12 Tu Th	12 MWF	11 MWF		

Emergency Evacuation/Shelter-in-Place Procedures

In the event of an emergency evacuation (i.e. fire or other emergency), classes meeting in **Science 1** are directed to **reassemble at the Chase Gymnasium** so that all persons can be accounted for. Complete details of the College's emergency evacuation, shelter-in-place, and other emergency procedures can be found at http://www.oneonta.edu/security .

Course Expectations and Guidelines

I expect you to follow the guidelines for behavior below:

- Attend all classes and arrive punctually.
- If unavoidably late for a class, enter quietly and unobtrusively, and behave in other required ways to minimize distraction.
- Remain alert and attentive during lectures, discussions, and other class/lab activities.
- Avoid unnecessary conversation during lectures, discussions, and other class/lab activities.
- **Contribute to class experiences by asking relevant questions,** offering relevant examples or views, adequately answering questions posed by others, **engaging in critical and independent thought, and challenging both the instructor and the curriculum materials assigned for the course**.
- Demonstrate courtesy and respect in dealing with instructors and classmates.
- Recognize and seek to understand diverse points-of-view.
- Plan to spend 2 to 3 hours out-of-class time in academic study for every one hour of class attendance.
- Thoroughly plan and prepare for classes.
- Notify the instructor in advance, if possible, or in a timely fashion, if unable to attend a class or lab, take a scheduled exam or quiz, submit a scheduled assignment, or remain in the classroom for the entire class meeting because of unavoidable circumstances.
- You are expected to read each chapter before we cover it in class. This will allow you to formulate questions concerning material that is not clear, or that you would like to have covered in greater detail. I use lectures to focus on the most important aspects of the topic. I strongly encourage you to ask questions during lecture. There are no 'dumb' or 'stupid' questions. Often the questions you have are shared by others. You should view lectures as the time and place for discussion, and I welcome your thoughts and questions!
- Any reasonable accommodation will be provided for students with physical, sensory, learning, or psychiatric disabilities. Please contact me for assistance as early as possible.
- If English is not your primary language and you would like to have additional time in which to take the exams, let me know. Anyone who needs additional time for the exams will be extended the same courtesy.
- Academic dishonesty will not be tolerated and those engaging in it will be prosecuted. See the Academic Honesty & Dishonesty pamphlet published by the Dean of Students Office for further information.
- **Finally, turn off cell phones before coming to class!** A ringing (or singing!) phone is almost impossible for others to ignore. Especially the lecturer, who may wander so far off course that everyone will get upset...Of course, medical conditions can override this request.