

GEOL460 - Field Geophysics

Monday, 1:00-5:00 PM, Classroom TBD

Fall 2015 Syllabus

Instructor

Dr. Nicholas Schmerr

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Office hours: Upon appointment

The most reliable way to contact me is to send an email at the address above. Please don't hesitate to do so.

Description

Advanced undergraduate students will become familiar with geophysical instrumentation used for both scientific and industrial applications. Students will be given an introduction to the use of geophysical instrumentation for data collection, processing, and analysis, design of field experiments for investigating field geophysical problems, and an introduction to the theory of instrument design and use. Instruments that will be covered include (but are not limited to): broadband seismometers, geophones, ground-penetrating radar, magnetotellurics, and Global Positioning Satellites.

This class will consist of three parts. 1) Lecture describing a particular type of geophysical instrumentation, including instrumental theory, design, application, limitations, data types, and examples of geophysical problems that instruments can be used to address. 2) In-class practical and hands on experience operating equipment, reducing data, writing programs to process data, and group activities with collected datasets. 3) Taking geophysical instrumentation out into the field to investigate a scientific problem that we develop in class lectures and practicals. Part 1 and 2 will be two 1 hour and 55 minute back-to-back sessions, plus a 10-minute break between parts. Part 3 will be a field trip for 4 hours in the afternoon to a local site on the University of Maryland campus or nearby. Exact duration may vary as to adapt to the material that needs to be covered, and for fieldwork, weather conditions permitting.

Homeworks will be assigned most weeks, due within a week. Several exercises will consist of a self-guided exploration of a database or a specific toolkit. Many problems will require simple programming skills and familiarity with the use of computers.

Every student is expected to do the reading before class and bring questions.

In-lieu of a final exam, each member will help to prepare a final group report of the data we collect in our field areas throughout the semester.

Lectures/Practicals:

Mondays, 1:00-2:55 PM; 3:05 PM-5:00 PM

Labs

Mondays 1:00-5:00 PM, alternating with Lectures and Practical

Class Materials**Text**

Reading material is available through the ELMS online reserve system. The readings are mandatory as the text is more complete than the summary class notes. Chapters will be selected from

- *Introduction to Applied Geophysics*, by H. Robert Burger, Anne F. Sheehan, and Craig H. Jones, W. W. Norton & Company, 2006, ISBN 978-0-393-92637-8
- *Field Geophysics*, by John Milsom, John Wiley & Sons Ltd, 1996, ISBN 0-470-84347-0

On occasion we will also be reading articles from the peer-reviewed and published literature, for which I will provide you a copy.

Website

A website for the class is available through the University ELMS/blackboard system. Follow the link to <https://elms.umd.edu/>, enter your directory ID and password. If you are registered, you should be able to see GEOL460 in your list of classes and access the website that way.

Grading**Homeworks (35%)**

Problem sets will be assigned almost every Monday, due the following week. If you are having trouble please contact me right away to set up a meeting. I would much rather grade a homework set where everyone understood it perfectly because they came and talked to me about it, rather than tell you with red ink what you did wrong!

You are welcome to discuss with each other the problem set but make sure to write out all assignments yourself and understand how to do problems on your own.

Homework assignments must be handed in hard copy, but you can e-mail them to meet a deadline and bring a printed copy later. Late homeworks will be accepted with a 5% per day late penalty, unless I grant an extension for an extenuating circumstance. If you have not handed in an assignment by the time that it has been graded and returned to other students, it will no longer be accepted and will receive a grade of zero.

Occasionally, homeworks may require access to Internet tools, computer calculation and simple programming (Excel or Matlab), and use of the mapping software GMT (guided tutorials will be available). Computer labs with the required software are available from OIT:

CSS Lab Hours (rooms 3330 & 3332):
 Mon. through Thurs. open 8:00 am - 10:00 pm.
 Fri. open 8:00 am - 5:00 pm
 Closed on Sat. & Sun.

In-Class Activities (35%)

Your mastery of the materials in this course requires that you participate in the lectures, practicals, and field exercises. Participation is mandatory; your grade in this portion of the class will consist of completing in class practical exercises and training (50%) and participation in field trips (50%). These activities **CANNOT** be reproduced outside of class, and you will not be allowed to use equipment if you have not been trained in one of the practical exercises. Please notify me as soon as possible if you have an illness or other compelling circumstances outside of your control.

Field Project Report (30%)

The purpose of the Field Project Report is to increase your familiarity with how field geophysics works, give you experience working in a scientific group, to get you thinking critically about scientific ideas, and to provide you experience in scientific reading, writing, and speaking. Each student will be expected to become proficient in a particular geophysical method for the project. You will give a short 10-minute presentation summarizing the group’s results from this method, and write a 1000 word chapter in our group project report that summarizes the outcomes of this portion of the project. We will hold a symposium where you will present the outcomes of your portion of the project.

Grade calculation:

With diligent work, it is possible for every student to attain an A in this class. Letter grades will be assigned based on the following scale. Standard rounding will be used, with final scores rounded to the nearest integer percentage, such that a 69.4 would be a D+ and a 69.5 a C-.

100-97%	A+		96-94%	A		93-90%	A-
89-87%	B+		86-84%	B		83-80%	B-
79-77%	C+		76-74%	C		73-70%	C-
69-67%	D+		66-64%	D		63-60%	D-
<60%	E						

Appeal of grades

You may appeal your grade on any exam prior to the posting of final course grades. In this as in all college courses, you should retain all graded items until proper grades have been recorded on your transcript.

CORE/GED

This class does not fulfill CORE or GED requirement.

Expectation of students

Prerequisite knowledge

GEOL 460 is an upper level course designed for students pursuing a major in science, and having already a good understanding of geophysics, calculus, and basic physics. For that reason, it is required student have taken GEOL 446 (Geophysics) as well as MATH 140 and MATH 141, and one course from PHYS 141, PHYS 161, or PHYS 171. Non-degree-seeking students require the permission of the instructor.

Academic Integrity

The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets a high standard for academic integrity at Maryland for all undergraduate and graduate students at the University of Maryland. As a student you are responsible for upholding these standards in this course. It is incredibly important for you to be aware of the consequences of cheating, fabrication, plagiarism, and/or facilitation of academic dishonesty. For more information University for Maryland Code of Academic Integrity please visit: <http://www.president.umd.edu/policies/docs/III-100A.pdf>.

The University of Maryland is one of a number of universities with a student-administered Honors Code and an Honors Pledge, more information on the code can be found at: <http://shc.umd.edu/SHC/HonorPledgeInformation.aspx>. Please make sure you are familiar with your responsibilities under the code. This code prohibits students from cheating on exams/homeworks, submitting the same paper for credit in multiple courses without the permission of instructors, purchasing of papers or homework solutions in any form, submission of fraudulent documents, forging of signatures, and plagiarism. Unless stated otherwise, on every examination, paper or other academic exercise, the student shall write by hand and sign the following pledge: *“I pledge on my honor that I have not given or received any unauthorized assistance on this examination.”*

Religious Observances

The University of Maryland does not penalize students for participation in religious observances and whenever feasible, students are allowed to make up academic assignments that are missed due to such absences. Students are responsible for notifying the instructor of projected absences within the first two weeks of the semester. **This notice should be provided as soon as possible, but no later than the end of the schedule adjustment period (Date TBD).** It is the student's responsibility to inform the instructor of any intended absences for religious observances in advance and that prior notification is especially important in connection with final examinations, since failure to reschedule a final examination before the conclusion of the final examination period may result in loss of credits during the semester.

Academic Accommodations

The University of Maryland is legally obligated to provide appropriate accommodations for students with disabilities. The campus's Disability Support Services (DSS) works with students to address a variety of issues ranging from learning disabilities and attention deficit hyperactivity disorders to physical and psychological disabilities. If a student has a disability, DSS should be consulted (4-7682 or dissup@umd.edu). Note that to receive accommodations, a student must first register with the DSS and have their disabilities documented by DSS. The DSS office then prepares an Accommodation Letter that should be presented to the instructor regarding needed accommodations. Students are responsible for presenting this letter to their instructors by the end of the drop/add period (February 6). Please visit: <http://www.counseling.umd.edu/DSS/> for more information.

Course Evaluation

Your participation in the evaluation of course through the CourseEvalUM is an important responsibility you hold as a student of our academic community. From time to time, I may request you to provide informal feedback on how the course is going; this feedback is crucial in helping me improve the course as we progress through the semester. Your feedback is confidential and important to the improvement of teaching and learning at the University of Maryland, as well as to the tenure and promotion process. The final course evaluation will be conducted through CourseEvalUM, which will be open to you to complete your evaluations in the last week of the semester. Please go to the website (<http://www.courseevalum.umd.edu>) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing online through Testudo the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.

Extra Credit

Opportunities for extra credit will be provided at my discretion and requirements will be announced in class.

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