

GEOL 10100-12 - Introductory Geology Laboratory Syllabus

Monday and Thursday: 9.45 to 11.00 am

Hunter North, Room 1021

Spring 2017

Instructor: Dr. Shruti Philips
Office: North, Room 1032
Office Hours: *Mondays and Thursdays 12.30 to 1pm. or by appointment*
E-mail: sph0001@hunter.cuny.edu (communications to me must have GEOL 101 in the subject line and you must sign your full name as it appears in CUNYfirst)

Brief description/purpose of course:

GEOL 101, Introductory Geology Lab, is a hands-on laboratory science course. GEOL 101 assists you, in learning and expanding your understanding of the scale of the Earth and the forces that shape it with hands-on laboratory and field experiences. This course will serve as an introduction to the earth sciences and will prepare you for further coursework in the Environmental Studies program. It will also give you a working knowledge and vocabulary to take other physical geography and geology courses. Moreover, it will introduce you to some of the cutting edge technologies used in the earth sciences, potentially drawing some of you into an earth science related career path. In general, there will be a 1:2 ratio between lecture and lab work over the course of each week.

The objectives and goals of this course include:

- An understanding of the nature of science and the scientific method.
- The importance of thinking critically about scientific data.
- An understanding of how the earth was formed and how it has evolved and continues to evolve.
- A basic understanding of the rocks and minerals that make up the earth and the ability to identify the most important types of rocks and minerals and how they are formed (the rock cycle).
- A basic understanding of plate tectonics.
- An understanding of the vastness of geologic time, the Principle of Uniformitarianism and how geologists assess the ages of geologic features.
- An understanding of the formation and distribution of natural resources and the costs and benefits of their extraction.

This course will fulfill the **Common Core Requirement for category C, Life and Physical Sciences**.

This course is designed to produce the following learning outcomes:

- You will apply the fundamental concepts of plate tectonic theory and the rock cycle, fundamental concepts in geology
- You will apply the basic methods of observation and measurement to geological samples
- You will apply the scientific method to explore the rock record, remotely sensed data, seismic data and stratigraphic data to learn about the processes that create and modify Earth materials.
- You will present their observations, measurements, interpretations and conclusions in formal laboratory write-ups
- You will use the tools of geological science to carry out collaborative laboratory explorations
- You will gather, analyze and interpret geological data and present it in effective written laboratory reports.
- You will identify and apply research ethics and unbiased assessment in gathering and reporting their scientific data.

Further specific learning outcomes include:

1. A working knowledge of the International System (SI) of Units
2. Familiarity with basic laboratory procedures and the preparation of a proper lab book
3. An ability to interpret data by learning to read and create scientific graphs
4. Knowledge and skills to make a scale model of the Earth system
5. An understanding of the basic principles and tools of direct and remote observation that are used by geoscientists
6. Knowledge and skills to develop and test physical and quantitative models of isostasy and apply them to the Earth system
7. An understanding of convection and its role in plate tectonics
8. Skills to observe spatial geologic data and place it in the framework of Plate Tectonic Theory
9. Proficiency in using graphical and physical models of rock melting to infer how magma forms
10. An ability to identify the common minerals using basic tools of observation
11. Knowledge of “The Rock Cycle” and how it relates to plate tectonic processes
12. An ability to identify and interpret the origins of igneous, sedimentary and metamorphic rocks
13. An ability to deduce basic information about earth processes and history by “reading the rock record”
14. An understanding of how to apply the Principle of Uniformitarianism
15. Ability to apply the principles of relative and absolute dating to analyze the geologic history of an outcrop/region

Required textbook(s):

- **Laboratory Manual in Physical Geology**, Edited by Richard M. Busch, Prentice Hall, 10/e, 2014
ISBN-13: 978-0321944511 ISBN-10: 0321944518
- A black and white (or green and white) college-ruled composition notebook

Please make sure that you bring to each class the following items: a pen, No. 2 pencil(s), eraser, calculator, metric ruler, and colored pencils. All other lab materials will be supplied by your instructor.

Course evaluation/grading:

Assignments	Weighting
8 labs + Field Trip	45% (5% each)
3 practical exams	36% (12% each)
Group Assignment	9%
Attendance and participation	10%

While the exams are technically not cumulative, material covered in the latter part of the course is dependent on the material from the earlier part of the course. Do NOT miss an exam. Make-up exams will NOT be given except under the most extraordinary circumstances such as documented illness, documented death in the family, documented alien abduction, etc. Make up exams will be given at a mutually convenient time and while they will cover the same information as the original exam, the questions and/or practical materials will be different.

A final grade of IN (incomplete) is not normally given in this course except, again, under the most extraordinary and documented circumstances. You must contact me within 48 hours of the scheduled day/time of the final exam and complete a Contract to Resolve an Incomplete Grade. Otherwise, I will average your laboratory, exam, and attendance and participation grades and record what you have earned. To qualify for Credit/No Credit you must have completed **all nine laboratory exercises, taken the three exams, and have satisfactory attendance and participation.** Credit/No Credit forms will be accepted up to 15 minutes prior to the start time for the third exam. I will not accept a Credit/No Credit slip after the third exam is distributed. The Hunter College grading system will be used in this class and can be viewed in the latest undergraduate catalog available online at <http://catalog.hunter.cuny.edu/>.

Classroom policies:

There is no texting permitted in the classroom—turn your phones off. Earphones are not to be worn in the classroom either on ears or around your neck. Laptops/netbooks, etc. are not to be used for taking notes. No electronic devices are allowed during exams. No food or drink is allowed in the laboratory. Samples and equipment must be handled gently.

Laboratory Preparation:

Come to class prepared. I expect you to have read the laboratory exercise listed for each class *prior* to the beginning of that class period. Laboratory exercises are complex, and if you do not read them before class you will have difficulty turning them in on time.

Laboratory notebook preparation:

The lab book is the most important record that you, as a scientist, can keep. It is a detailed record of your experiments, observations, results, successes and failures. In this class you are required to keep a laboratory notebook as an important record of your laboratory work. It will also serve the practical purpose of keeping all of your assignments in one place, so that you can use it as a reference and a study tool. Your laboratory notebook is a simple black and white (or green and white) composition notebook that can be purchased in the Hunter College Bookstore or any office supply store.

You are required to follow these directions to prepare and keep your notebook: At the beginning of each new lab, you must come to class with the introduction already written. This is to make sure you are familiar with the laboratory material and have thought about the purpose and methods of the lab. This will enhance your enjoyment of the lab and help you use the laboratory period efficiently.

1. Print your name and semester on the outside cover of your lab book.
2. Number all the pages in your lab book and label the first three pages “Table of Contents”.
3. As you work in the lab notebook date each page with the current date and fill in the “Table of Contents.” All page numbers and dates should be on the upper left of the left-hand pages and the upper right of the right-hand pages.
4. All work must be done in pen. If you need to change an answer, etc., cross out the original with a single line, and clearly make the desired change. The purpose of keeping a lab notebook is to give you experience in creating a permanent record that will allow you, or anyone reading your notebook, to reconstruct your experiment(s) and obtain similar results. Keeping such a record is one of the most important aspects of doing science. You may keep notes that I will give you in the beginning of each laboratory in this notebook, or you may choose to keep these notes in a separate book.
5. Each laboratory exercise will include the following sections: an introduction, procedure, materials used (where relevant), charts and tables that you will fill in on the appropriate pages of your lab manual and attach to your notebook, answers to the questions posed in the AGI Laboratory Manual, Results/Discussion and a conclusion. You must include the relevant figures, charts, graphs, etc., that a given question and/or answer refers to. Any charts, tables, maps, etc., from the AGI manual are to be stapled or taped into your lab notebook so that both sides of a page are easily readable (if necessary) and so that no paper extends beyond the bounds of the notebook. This means that if you refer to any diagrams, maps, charts, etc., they must be included in your notebook. Remember to reference the page and figure number to your answers and/or conclusions. You will be shown an example of a laboratory notebook during your first or second class meeting.

6. Answer all questions in full sentences. **DO NOT RECOPY THE QUESTION IN YOUR NOTEBOOK.** Rather, answer the question so that the question is implicit in the answer. For instance, if the question is “What color is the rock on table A?” your answer might be “The color of the rock on table A is gray.” An unacceptable answer would be “gray.” Use proper grammar and spelling. If you aren’t sure of the spelling use a dictionary. A very convenient online dictionary can be found at www.m-w.com.
7. It is your responsibility to make your notebook clear and legible. I must grade your notebooks efficiently and if I cannot find your answers easily or decipher your handwriting, points will be deducted.

Lab Homework:

Some of the laboratory exercises will be completed at home. As outlined in the syllabus, you are required to complete one laboratory approximately every two to three class periods, and since the laboratory exercises will count for 45% of your total course grade, it is important for you to do the assigned work.

The **introductions and conclusions** of your labs must be in your own words. You may work with other students at your table, but each of you must turn in your own notebook. I do not regard homework as something to be furiously scribbled down during class while other things are going on. Your laboratory notebooks must be neat and complete. The presentation of your work is very important and will influence your grade. If you do the most professional job that you can, you will learn more, have an excellent study tool, and a notebook to bring to me if you ever want a recommendation for a job or graduate school. It is to your advantage to make your answers and work very clear so that your work can be graded quickly and accurately. I will not have time to search for your answers.

Grading of your laboratory exercises will be based on the quality and accuracy of the observations, explanations, answers to questions and conclusions. The grading of your laboratory exercises will be as follows: **5=excellent, 4=good, 3=fair, 2=poor, 1=terrible, 0=not handed in.** You will automatically lose points if your laboratory exercise is sloppy, or done in pencil (unless specified) and if your pages are not numbered and dated or does not adhere to any of the above criteria.

Group Assignment: You will be assigned to groups. Each group will research and present a 5-10 minute oral and visual presentation to the class on a specific topic in geology. Each of you is expected to contribute to the project. All students in a group will receive the same grade. Presentations will be made using Powerpoint.

When are lab exercises due?

Lab exercises are due, in lab, at the beginning of your next class meeting – when you start the next lab. Late lab exercises will be graded out of 4. This policy will be strictly enforced. If you miss a class session, do not wait until the next meeting to hand in your lab assignment. If I am not available to accept your late lab, take it to the office of the Department of Geography, HN1004, and have the department’s Administrative Assistant, Ms. Martha Taylee, initial and date your lab. This will “stop the clock.”

Tentative Syllabus for Spring 2017

Dates	Laboratory Assignment
Mon 1/30	Introduction to AGI lab manual, materials, and methods
Th 2/2	Lab 1- Observing and Measuring Earth Materials and Processes
Mon 2/6	Lab-1
Th 2/9	Lab-1
W 2/15	<i>Lab 1 due; Lab 2- Plate Tectonics and the Origin of Magma</i>
Th 2/16	Lab-2
Th 2/23	Lab-2
Mon 2/27	<i>Lab-2</i>
Th 3/2	<i>Lab 2 due ; Lab 3, Mineral Properties, Uses, and Identification</i>
Mon 3/6	<i>Lab-3 Group assignment discussed and assigned.</i>
Th 3/9	Lab-3
Mon 3/13	Lab-3
Th 3/16	<i>Lab-3 due; Mineral Practical test</i>
Mon 3/20	Lab 5- Igneous Rocks and Volcanic Hazards
Th 3/23	Lab-5
Mon 3/26	<i>Lab 5 due; Lab 6-Sedimentary Rocks, Processes, and Environments</i>
Th 3/30	Lab-6
Mon 4/3	Lab-6
Th 4/6	Lab-6
Th 4/20	<i>Lab 6 due ; Lab 7- Metamorphic Rocks, Process, and Resources</i>
Mon 4/24	Lab 7
Th 4/27	<i>*Central Park Field Trip</i>
Mon 5/1	<i>Lab 7 due; Lab 4- Rock review</i>
Th 5/4*	Rock Practical test
Mon 5/8	Lab 8 – Dating of Rocks, Fossils and Geologic Events
Th 5/11	Lab-8
Mon 5/15	Lab 8
Th 5/18	<i>Lab 8 due and catch up session</i>
Th 5/25	11.30-1.30 Geologic timescale practical exam, Group Assignments presented

*This field trip to Central Park is dependent upon the weather. You will be expected to meet the class at a predetermined location from which we will walk and examine various surface features of the landscape. More information will be provided in the week before the field trip.

Hunter College statement on Academic Integrity: Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Plagiarism, dishonesty, or cheating in any portion of the work required for this course will be punished to the full extent allowed according to Hunter College regulations.

ADA Policy: In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY to secure necessary academic accommodations.