

GEOL 10100 - Introductory Geology Laboratory Syllabus (Spring 2017)

Instructor: **Tom Carboni**

Section 01: Tu, F 9:45 – 11:00am

Section 4: Tu, F 11:10 – 12:25pm

Section 5: Tu, F 12:45 – 2:00pm

Hunter North, Room 1021

1/31/17 – 5/26/16

Office: HC North, Room 1032

Office Hours: Tu, F 10:30 – 11 or by appointment

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Contact Policy: You may email me with any questions you have regarding the laboratory material. You must include GEOL 101 in the subject line and sign your full name as it appears in CUNYfirst. I do not respond to unsigned email messages. In addition, you **MUST** use your hunter email when contacting me. You can expect to have your email messages returned within 24 hours except over the weekend when you should expect a 48 hour reply window. Do **NOT** email me the night before a lab is due or the morning of and expect an answer from me.

Brief description/purpose of course:

GEOL 101, Introductory Geology Lab, is a hands-on laboratory science course. GEOL 101 assists you, the student, 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 laboratory notebook
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 understanding of how to analyze samples of minerals
11. An ability to identify the common minerals using basic tools of observation
12. Knowledge of “The Rock Cycle” and how it relates to plate tectonic processes
13. An ability to identify and interpret the origins of igneous, sedimentary and metamorphic rocks
14. An ability to deduce basic information about earth processes and history by “reading the rock record”
15. An understanding of how to apply the Principle of Uniformitarianism
16. Ability to apply the principles of relative and absolute dating to analyze the geologic history of an outcrop/region
17. An understanding of the costs, benefits and consequences of extraction of economically valuable geologic deposits.

Required textbook(s):

AGI/NAGT *Laboratory Manual in Physical Geology*, 10th ed. Richard M. Busch, ISBN-10: 0321944518; ISBN-13 9780321944511

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.

I. Course evaluation/grading:

Assignments	Weighting
8 labs	48% (6% each)
3 practical exams	36% (12% each)
Individual Assignment	6%
Attendance and participation	10%

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 grades 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 eight 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/content.php?catoid=15&navoid=1433>

II. 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, Kindles, or Ipads , can be used but at your own risk (you may drop a rock on your screen and crack it). No electronic devices are allowed during exams. No food or drink is allowed in the laboratory. Samples and equipment must be handled gently.

III. 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.

IV. 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.
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.

V. 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 three to four class periods, and since the laboratory exercises will count for 48% 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 his/her 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.

Individual Assignment: Every individual will research a specific topic in Geology. A guideline for topics will be given a month and a half into the semester on March 17th; however, you are not limited to these topics. Suggestions for topics can be discussed with me but must first be approved. Presentations using PowerPoint are optional but are encouraged.

VI. 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 have their grade **reduced 20% for each day received late** unless you have a valid excuse that can be documented. Once labs are collected, any labs handed in are considered late. This policy will be strictly enforced. Lab exercises must be stapled (no paper clips) with your name printed neatly in the space on the first page and in the lower-right corner of the front of every page. 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."

VII. Extra Credit:

No extra credit is given in this course. Whatever effort you would put into an extra credit assignment put into completing the lab exercises and studying for exams.

VIII. 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.

IX. 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.

X. Schedule of topics and readings: Below is a tentative schedule of class meetings (based on fall 2014 with a Monday/Thursday schedule), topics, reading assignments and laboratories. I reserve the right to change the schedule and/or assignments as necessary.

DAY	DATE	CLASSWORK	DUE DATE
Tu	1 / 31	Lab 1 – Thinking Like a Geologist	
F	2 / 3	Lab 1 – Thinking Like a Geologist	
Tu	2 / 7	Lab 2 – Plate Tectonics and the Origin of Magma	Lab 1
F	2 / 10	Lab 2 – Plate Tectonics and the Origin of Magma	
Tu	2 / 14	Lab 2 – Plate Tectonics and the Origin of Magma	
F	2 / 17	Lab 16 – Earthquake Hazards and Human Risks	Lab 2
Tu	2 / 21	Lab 16 – Earthquake Hazards and Human Risks	
F	2 / 24	Lab 3 – Mineral Properties, Identification, and Uses	Lab 16
Tu	2 / 28	Lab 3 – Mineral Properties, Identification, and Uses	
F	3 / 3	Lab 3 – Mineral Properties, Identification, and Uses	
Tu	3 / 7	Lab 3 – Mineral Properties, Identification, and Uses	
F	3 / 10	Lab 3 – Mineral Properties, Identification, and Uses	
Tu	3 / 14	MINERAL EXAM	Lab 3
F	3 / 17	Lab 5 – Igneous Rocks and Processes	
Tu	3 / 21	Lab 5 – Igneous Rocks and Processes	
F	3 / 24	Lab 5 – Igneous Rocks and Processes	
Tu	3 / 28	Lab 6 – Sedimentary Processes, Rocks, and Environments	Lab 5
F	3 / 31	Lab 6 – Sedimentary Processes, Rocks, and Environments	
Tu	4 / 4	Lab 6 – Sedimentary Processes, Rocks, and Environments	
F	4 / 7	Lab 6 - Sedimentary Processes, Rocks, and Environments	Lab 6
Tu	4 / 11	NO CLASSES! SPRING RECESS!!!	
F	4 / 14	NO CLASSES! SPRING RECESS!!!	
Tu	4 / 18	NO CLASSES! SPRING RECESS!!!	
F	4 / 21	Lab 7 – Metamorphic Rocks, Processes, and Resources	
Tu	4 / 25	Lab 7 – Metamorphic Rocks, Processes, and Resources	
F	4 / 28	ROCK EXAM	Lab 7
Tu	5 / 2	Central Park Field Trip	
F	5 / 5	Lab 8 – Dating of Rocks, Fossils, and Geologic Events	
Tu	5 / 9	Lab 8 – Dating of Rocks, Fossils, and Geologic Events	
F	5 / 12	Lab 8 – Dating of Rocks, Fossils, and Geologic Events	
Tu	5 / 16	Presentations; Last Day of Class	Lab 8
Sec. 01, Monday, 5/22 -- FINAL EXAM – 11:30 AM to 1:30 PM			
Sec. 04, Tuesday, 5/23 – FINAL EXAM – 9:00 to 11:00 am			
Sec. 05, Friday, 5/26 – FINAL EXAM – 11:30 AM to 1:30 PM			

Note: Check the academic calendar for other important dates such as withdrawal dates and tuition refund
<http://www.hunter.cuny.edu/onestop/repository/files/registrar/spring-2017-calendara.pdf> 26