

**GEOL 102 Historical Geology:
The History of Earth and Life**
Spring Semester 2015

PLS 1113 9:00-9:50 am MWF (Lecture)
GEO 2107 2:00-5:00 p.m. W (Lab)

Dr. Thomas R. Holtz, Jr.
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NOTE: It is your responsibility as a student to completely read through and understand this syllabus. If you have questions about it, please contact Dr. Holtz. You will be held responsible for following all requirements of this syllabus.

LEARNING OUTCOMES: By the end of the semester, every student should be able to:

- Identify the major techniques used by geologists to assess the paleoenvironments and sequence of events found in the rock record
- Recognize the sequence of and interrelationships between major events in the history of the Earth, its surface, and its life forms
- Properly classify different types of sedimentary rocks & structures and major groups of fossilizing organisms from hand samples
- Correctly interpret geological cross-sections, fence-diagrams & other stratigraphic charts, and geologic maps

Course Organization: 3 lectures per week (Monday, Wednesday, Friday), 1 laboratory per week (Wednesday).

Field Trip: 1 non-mandatory field trip is planned:

- Saturday, March 28: historical geology of western Maryland (latest Precambrian through Triassic)
This is non-mandatory and non-graded, but will greatly advance your understanding of historical geology; additionally, there will be rock- and fossil-collecting opportunities on the trips.

Grade: Midterm Exam 1:	20%	Labs:	20%
Midterm Exam 2:	20%	Lab Exam 1:	5%
Final Exam:	20%	Lab Exam 2:	5%
Geologic Time Quizzes:	10%		

Grade Scale: ≥ 90 , A; 80-89, B; 70-79, C; 60-69, D; < 60 , F. “+” and “-” grades are given to the top and bottom two-point range, respectively, within each grade.

Grade Scale: The numbers given represent the thresholds that must be passed in order to reach that grade (for example, A+ is 97.000... and any number greater). There is no rounding for letter grades; the thresholds must be passed. F is any grade below D-. Thresholds: 97, A+; 93, A; 90, A-; 87, B+; 83, B; 80, B-; 77, C+; 73, C; 70, C-; 67, D+; 63, D; 60, D-; < 60 , F.

The Final Grade is the algebraic sum based on the numerical grades.

Midterm Exams (20% each): Two pen-and-paper exams on March 2 and April 15, respectively. Absence from the exams will not be excused except for those causes approved by University policy in the University of Maryland Undergraduate Catalog: see <http://www.umd.edu/catalog/index.cfm/show/content.section/c/27/ss/1584/s/1540>. Only those students excused for these causes will be eligible for a make-up exam.

Final Exam (20%): A pen-and-paper final exam during the regularly scheduled exam season. It is cumulative for the entire course. Format is similar to the mid-term exams. The preliminary date is **MONDAY MAY 18, 8-10 am** (to be confirmed mid-semester): please plan your end-of-semester travel accordingly!! (It that means informing your

parents about this now, please do so!) Again, absence from the final will not be excused except for those causes approved by University policy in the University of Maryland Undergraduate Catalog: see <http://www.umd.edu/catalog/index.cfm/show/content.section/c/27/ss/1584/s/1540>.

Geologic Time Quizzes (10%): The geologic time scale is a concept that all earth science students must master. Throughout the course, on an approximately bi-weekly basis, there will be brief fill-in-the-blank quizzes on the time scale. These will sometimes vary as to what details they emphasize. The lowest two geologic time quizzes will be dropped.

Labs (20%): Essentially every week there will be a lab (the last lab extends over two weeks; and there are no labs on lab exam weeks). Labs are due the week after they are assigned, allowing students time to examine specimens over the course of the week if they wish. For more information, see the separate lab syllabus. **NOTE:** Most labs are derived from the **DEH** textbook (see below); it is vitally important that each student purchase a copy of this text.

Lab Exams (5% each): There are two lab exams. These are done in the lab time scheduled, and include a mixture of specimen-based and graphics-based questions. The first one (March 11) concerns materials from the labs of weeks 1-5; the second (May 6) concerns materials from the remaining labs.

Lecture Text: *Earth System History 4th Edition* by Steven M. Stanley & John A. Luczaj (2015, W.H. Freeman & Co., ISBN-13 978-1429255264)

Lab Text: *Deciphering Earth History: Exercises in Historical Geology. 4th Edition. (DEH)* by R.A. Gastaldo, C.E. Savdra & R.D. Lewis (2006, CPC Publishing, ISBN-13 978-0898923162)

Supplementary Text: *Maryland's Geology* by Martin F. Schmidt, Jr. (2010, Schiffer Publishers, ISBN-13 978-0764335938)

Websites: <http://www.geol.umd.edu/~tholtz/G102/>
Website includes copies of the syllabus, handouts, lecture notes, etc. This site will be built up throughout the semester as each lecture page, etc., is added.

The ELMS Canvas site will include announcements concerning the class; copies of the handouts; and so forth. If you have not already done so, make sure that you get access to ELMS.

Policies: can be very useful, make sure that all your work you turn in is your own. The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://shc.umd.edu/SHC/Default.aspx>

The University of Maryland is one of a small number of universities with a student-administered Honors Code and an Honors Pledge, available on the web at <http://shc.umd.edu/SHC/HonorPledgeInformation.aspx>. The code prohibits students from cheating on exams, plagiarizing papers, submitting the same paper for credit in two courses without authorization, buying papers, submitting fraudulent documents, and forging signatures. The University Senate encourages instructors to ask students to write the following signed statement on each examination or assignment: "I pledge on my honor that I have not given or received any unauthorized assistance on this examination (or assignment)."

Thus, in GEOL102, work submitted under your name, even for extra credit, must **unambiguously** be exclusively your own. Any evidence of dishonesty on any graded assignment will result in a referral to the [Office of Student Conduct](#). **Note that Geology regards the unauthorized distribution of any course materials as constituting facilitation of academic dishonesty and will report this to the OSC.**

Academic Accommodations: If you have a documented disability, you should contact Disability Support Services 0106 Shoemaker Hall. Each semester students with documented disabilities should apply to DSS for accommodation request forms which you can provide to your professors as proof of your eligibility for accommodations. The rules for eligibility and the types of accommodations a student may request can be reviewed on the DSS web site at <http://counseling.umd.edu/DSS/eligibility.html>.

Religious Observances: The University System of Maryland policy provides that students should not be penalized because of observances of their religious beliefs, students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances. It is the responsibility of the student to inform the instructor of any intended absences for religious observances in advance. **Notice should be provided as soon as possible but no later than the end of the schedule adjustment period (February 6).** Faculty should further remind students that prior notification is especially important in connection with final exams, since failure to reschedule a final exam before the conclusion of the final examination period may result in loss of credits during the semester. The problem is especially likely to arise when final exams are scheduled on Saturdays.

Attendance: Regular attendance and participation in this class and lab is the best way to grasp the concepts and principles being discussed. However, in the event that a class must be missed due to an illness, the policy in this class is as follows:

1. For every medically necessary absence from class (lecture or lab), a reasonable effort should be made to notify the instructor in advance of the class. When returning to class, students must bring a note identifying the date of and reason for the absence, and acknowledging that the information in the note is accurate.
2. If a student is absent on days when exams or labs are scheduled he or she is required to notify the instructor in advance, and upon returning to class, bring documentation of the illness, signed by a health care professional. Absences from exams will not be excused except for those causes approved by University policy (see <http://www.umd.edu/catalog/index.cfm/show/content.section/c/27/ss/1584/s/1540> of the *UMCP Undergraduate Catalog*). Only those students excused for these causes will be eligible for a make-up exam.

Absences from the final exam will not be excused except for those causes approved by University policy (see <http://www.umd.edu/catalog/index.cfm/show/content.section/c/27/ss/1584/s/1540> of the *Undergraduate Catalog*). Only those students excused for these causes will be eligible for a make-up exam.

Miscellaneous: Much of the information presented is not available in the readings; it is essential that students attend all lectures and take their own notes. If you cannot make a certain lecture, try and find another student who might lend your their notes. (In fact, establishing a study group early in the course has proven useful for many students in the past).

In cases of inclement weather or other unexpected emergencies, the University may close. Please consult the University main webpage (<http://www.umd.edu>) or call 301-405-7669 (SNOW) to confirm such cancellations. Dr. Holtz will contact students via ELMS in order to inform them concerning delays of due dates for projects to be handed in or for exams: typically these will be shifted until the next available class date. Almost certainly lectures cancelled due to University closure will be posted on ELMS using Panopto.

Keep up with the required readings! Although the format of the lectures and the readings do not always match, the readings are important as well. Some of the material to be tested is covered in more detail in the readings than in class.

Readings should be done **prior** to the classtime they are listed.

Course Evaluations: CourseEvalUM will be open for students to complete their evaluations for Spring 2014 courses between Tuesday, April xx, and Friday, May xx. Students can go directly to the website (www.courseevalum.umd.edu) to complete their evaluations, beginning April xx. You will be alerted about these dates and provided more information closer to that time, and students will be alerted via their official University e-mail account.

Students who complete evaluations for all of their courses in the previous semester (excluding summer), can access the posted results via Testudo's CourseEvalUM Reporting link for any course on campus that has at least a 70% response rate. You can find more information, including periodic updates, at the IRPA course evaluation website:
https://www.irpa.umd.edu/Assessment/CourseEval/fac_faq.shtml

The expectation is that all students will complete these. This is YOUR chance to anonymously evaluate this class: please use this opportunity!

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MAIN SYLLABUS

- Jan. 26 Ruins of an Older World: The Discovery of Earth History
Reading: Chap 1
- Jan. 28 Every Rock is a Record of History: Historical Approaches to Lithology
Reading: Chap. 2
LAB: Policies; Description and Classification of Sedimentary Rocks (*DEH* Lab 1)
- Jan. 30 Terrestrial Sedimentary Environments
Reading: Chap. 5
- Feb. 2 Fluvial & Deltaic Environments; Walther's Law
Reading: Chap. 5
- Feb. 4 Coastal & Marine Environments; Transgressions & Regressions
Reading: Chap. 5
LAB: Interpretation of Sedimentary Rocks (*DEH* Lab 2)
- Feb. 6 Geologic Time I
Reading: Chap. 6
- Feb. 9 Geologic Time II
Reading: Chap. 6
- Feb. 11 Lithostratigraphy
Reading: Chap. 6
LAB: Relative Time and Sequence of Events (*DEH* Lab 3)
- Feb. 13 Biostratigraphy & the Geologic Timescale
Reading: Chap. 6
- Feb. 16 Another Geography: Plate Tectonics
Reading: Chap. 8
- Feb. 18 Every Valley Shall Be Exalted...: Orogenesis I
Reading: Chap. 9
LAB: Lithostratigraphy (*DEH* Lab 4)
- Feb. 20 ...And Every Mountain and Hill Made Low: Orogenesis II & Geochemical Cycles
Reading: Chaps. 9 & 10
- Feb. 23 Fossils & Fossilization
Reading: Chap. 3, 4
- Feb. 25 Evolution I: On the Origin of Species by Means of Natural Selection
Reading: Chap. 7
LAB: Biostratigraphy & Radioactive Dating (read *DEH* Labs 5 & 6; actual lab will be a handout)
- Feb. 27 Evolution II: Patterns, Process, and Phylogeny
Reading: Chap. 7
- Mar. 2 **MIDTERM EXAM I**
- Mar. 4 Introduction to the Precambrian and the Hadean Eon: Strange Æons
Reading: Chap. 11

LAB: Fossil Preservation and Taphonomy (*DEH* Lab 8)

- Mar. 6 The Archean Eon I: Black Earth, Blue Earth, Grey Earth
Reading: Chap. 11
- Mar. 9 The Archean Eon II: Biogenesis
Reading: Chap. 11
- Mar.11 The Proterozoic Eon I: Birth of Modern Geology
Reading: Chap. 12
LAB: Lab Exam 1 (Covers material from 1/27 to 2/25)
- Mar. 13 [Online Lecture] The Proterozoic Eon II: Rodinia and Pannotia [do not meet in class]
Reading: Chap. 12
- Mar. 16-20 **SPRING BREAK!**
- Mar. 23 The Proterozoic Eon III: Snowball Earth and the Garden of Ediacara
Reading: Chap. 12
- Mar. 25 The Early Paleozoic Era I: Cambrian and Ordovician Tectonics
Reading: Chap. 13
LAB: Paleontology I Common Invertebrate Fossils (Lab will be a handout)
- Mar. 27 The Early Paleozoic Era II: When Trilobites Ruled the Earth
Reading: Chap. 13
- Mar. 28 (Sat.) – western Maryland Field Trip: details TBA**
- Mar. 30 The Middle Paleozoic Era I: Siluro-Devonian Geology
Reading: Chap. 14
- Apr. 1 The Middle Paleozoic Era II: Reef Madness and the Devonian Nekton Revolution
Reading: Chap. 14
LAB: Paleontology II Micropaleontology, Paleobotany, Vertebrate Paleontology (Lab will be a handout)
- Apr. 3 The Middle Paleozoic Era III: The Conquest of Land
Reading: Chap. 14
- Apr. 6 The Late Paleozoic Era I: Carboniferous Geology
Reading: Chap. 15
- Apr. 8 The Late Paleozoic Era II: Permian Geology
Reading: Chap. 15
LAB: Paleontology III Paleoenvironments & Paleoecology (Lab will be a handout)
- Apr. 10 The Late Paleozoic Era III: Life in the Coal Swamps
Reading: Chap. 15
- Apr. 13 The Late Paleozoic Era IV: Permian Life and the Permo-Triassic Extinction
Reading: Chap. 15
- Apr. 15 **MIDTERM EXAM II**
LAB: Interpretation of Geological Maps (Read *DEH* Lab 15; this Lab is a handout, but we will do Lab 15 during the next two weeks)

- Apr. 17 The Mesozoic Era II: Triassic-Jurassic Geology
Reading: Chap. 16
- Apr. 20 The Mesozoic Era II: Cretaceous Geology
Reading: Chaps. 17
- Apr. 22 The Mesozoic Era III: Black Shales and Chalk Seas, Flowers and Mammals
Reading: Chap. 16-17
LAB: Geologic Maps and Interpretation of Earth History in Selected Regions pt. 1 (**DEH** Lab 15)
- Apr. 24 The Mesozoic Era IV: The Age of Dinosaurs
Reading: Chap. 16-17
- Apr. 27 The Mesozoic Era V: The K/Pg Extinction
Reading: Chap. 17
- Apr. 29 The Cenozoic Era I: Paleogene Geology
Reading: Chap. 18
LAB: Geologic Maps and Interpretation of Earth History in Selected Regions pt. 2 (**DEH** Lab 15)
- May 1 The Cenozoic Era II: Neogene Geology
Reading: Chap. 19
- May 4 The Cenozoic Era III: The Age of Mammals
Reading: Chaps. 18-19
- May 6 The Cenozoic Era IV: The Scatterlings of Africa
Reading: Chaps. 19
LAB: Lab Exam 2 (covers material from 3/4 onward)
- May 8 The Cenozoic Era V: Quaternary Geology
Reading: Chap. 19-20
- May 11 The Cenozoic Era VI: To the Anthropocene and Beyond!
Reading: Chap. 20
- May 18 (**Monday**) Final Exam, PLS 1113, 8:00-10:00 am