

**GEOL 102 Historical Geology:  
The History of Earth and Life**  
Spring Semester 2017

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, April 15: 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.

<b>Grade:</b> Midterm Exam 1:	20%	Labs:	20%
Midterm Exam 2:	20%	Quizzes:	10%
Final Exam:	20%	Lab Exams:	10%

**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 1 and April 17, 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 **WEDNESDAY MAY 17, 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>.

**Quizzes (10%):** Weekly quizzes will be given either in class or in lab (depending on time available that week), but which emphasizes the material from the lectures. These will typically be multiple choice, fill-in-the-blank, matching, or true/false. The lowest two quizzes will automatically be dropped: this is how missed quizzes will be accommodated.

**Labs (20%):** Essentially every week there will be a lab. 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 15) concerns materials from the labs of weeks 1-7; the second (May 10) 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. 4<sup>th</sup> 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:** The University has provided a page on Academic policies at <http://www.ugst.umd.edu/courserelatedpolicies.html>. Each student is responsible for reviewing this page with regards to issues of Academic Integrity; the Code of Student Conduct; Sexual Misconduct; Discrimination; Accessibility; Attendance, Absences, or Missed Assignments; Student Rights Regarding Undergraduate Courses; Official UMD Communication; Mid-Term Grades; Complaints About Course Final Grades; Copyright and Intellectual Property; Final Exams and Course Evaluations; and Campus Resources. For specifics with regards to this course, see the following:

**Laptop/Tablet/Smartphone Use:** Recent studies have shown that:

- People who take notes using pen/pencil and paper more effectively process and master the material, especially with regards to their ability to answer conceptual questions. (Also, taking notes by hand allows easier doodling, which has been shown to promote focus and memory).
- More importantly, people using laptops are likely to start multitasking (pulling up social media; watching videos; playing games; doing work for other classes; etc.) and that such multitasking is detrimental to the both the student doing it and all students within view of that screen.

Towards this end, I ***very strongly encourage*** you to take notes via pencil/pen and paper. It is in your academic benefit to do this.

If you choose to take notes using a computer, you are agreeing to the following conditions:

- Computer use is limited to following along with lecture notes, taking notes yourself, or searching for additional information (via Wikipedia, journal articles, and similar sites) concerning the lecture matter.
- You will refrain from using your computer from any or all of the following during classtime: doing class assignments for this or other classes; using social media, texting,

email, or other electronic modes of communication; viewing any websites or apps other than those listed in the first bullet point (i.e., no checking news, entertainment, sports, shopping, etc., sites).

- Failure to restrict your computer use will mean that laptop & smartphone use by **all students** in class will be prohibited for the rest of the semester. Apologies to those students who prefer to use this method to take notes, but this is the only effective way of dealing with the bad actors.

When not in use, smartphones, tablets, laptops, and all other modes of electronic communication must be **turned off** and **stowed away** during class time. (**NOTE:** using your smartphone between your legs underneath the desk is *NOT* “stowed away”, and you aren’t and have never fooled a teacher or instructor when you try that...) If you are using the device for recording lectures, please activate them then leave them untouched for the remainder of the lecture.

That said, there may be some group activities in which we will use individual laptops/tablets/smartphones in class. Dr. Holtz will make every effort to inform you about this in advance. However, in those situations you may only use these devices for the task at hand.

Attendance in class is expected. 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).

Communication in this course will primarily be by means of the ELMS Inbox email system. 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.

**NOTE:** As part of the nature of the course, there will be a lot of memorization (less than a foreign language class, but more than that found in more mathematically-oriented introductory science classes). This will include lots of anatomical, geological, and paleontological terms, as well as evolutionary and temporal relationships. If you have difficulty memorizing, this may not be the class for you. Also, if there are words or concepts with which you are not familiar, feel free to ask Dr. Holtz (in class, after class, over email, etc.) for an explanation or clarification.

Course Evaluations: CourseEvalUM will be open for students to complete their evaluations for Fall 2016 courses during the last two weeks of the semester. Students can access CourseEvalUM through ELMS to complete their evaluations. 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](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. 25 Introduction: It's About Time  
Reading: Chap 1  
**LAB:** Overview of Policies and Introductions
- Jan. 27 Every Rock is a Record of History: Historical Approaches to Lithology  
Reading: Chap. 2
- Jan. 30 Terrestrial Sedimentary Environments  
Reading: Chap. 5
- Feb. 1 Fluvial & Deltaic Environments & Walther's Law  
Reading: Chap. 5  
**LAB:** Description and Classification of Sedimentary Rocks (*DEH* Lab 1)
- Feb. 3 Coastal & Marine Environments; Transgressions & Regressions  
Reading: Chap. 5
- Feb. 6 Physical Stratigraphy  
Reading: Chap. 6
- Feb. 8 Index Fossils, Correlation & Radiometric Dating  
Reading: Chap. 6  
**LAB:** Interpretation of Sedimentary Rocks (*DEH* Lab 2)
- Feb. 10 Lithostratigraphy  
Reading: Chap. 6
- Feb. 13 Biostratigraphy & the Geologic Timescale  
Reading: Chap. 6
- Feb. 15 Another Geography: Plate Tectonics  
Reading: Chap. 8  
**LAB:** Relative Dating and Sequence of Events (*DEH* Lab 3)
- Feb. 17 Every Valley Shall Be Exalted...: Orogenesis I  
Reading: Chap. 9
- Feb. 20 ...And Every Mountain and Hill Made Low: Orogenesis II & Geochemical Cycles  
Reading: Chaps. 9 & 10
- Feb. 22 Fossils & Fossilization  
Reading: Chap. 3, 4  
**LAB:** Lithostratigraphy (*DEH* Lab 4)
- Feb. 24 Evolution I: On the Origin of Species by Means of Natural Selection  
Reading: Chap. 7
- Feb. 27 Evolution II: Patterns, Process, and Phylogeny  
Reading: Chap. 7
- Mar. 1 **MIDTERM EXAM I**  
**LAB:** Biostratigraphy & Radiometric Dating (read *DEH* Labs 5 & 6; actual lab will be a handout)
- Mar. 3 Introduction to the Strange Eons of the Precambrian; The Hadean Eon:

- Reading: Chap. 11
- Mar. 6 ONLINE: The Archean Eon I: Black Earth, Blue Earth, Grey Earth [do not meet for class]  
Reading: Chap. 11
- Mar. 8 The Archean Eon II: Biogenesis  
Reading: Chap. 11  
**LAB:** Fossils Preservation and Taphonomy (*DEH* Lab 8)
- Mar. 10 The Proterozoic Eon I: Birth of Modern Geology  
Reading: Chap. 12
- Mar. 13 The Proterozoic Eon II: Rodinia and Pannotia  
Reading: Chap. 12
- Mar. 15 The Proterozoic Eon III: Snowball Earth and the Garden of Ediacara  
Reading: Chap. 12  
**LAB: Lab Exam 1 (Covers material from 2/1 to 3/1)**
- Mar. 17 The Early Paleozoic Era I  
Reading: Chap. 13
- Mar. 20-24 **SPRING BREAK!**
- Mar. 27 The Early Paleozoic Era II  
Reading: Chap. 13
- Mar. 29 The Middle Paleozoic Era I  
Reading: Chap. 14  
**LAB:** Paleontology I Common Invertebrate Fossils (Lab will be a handout)
- Mar. 31 The Middle Paleozoic Era II  
Reading: Chap. 14
- Apr. 3 The Middle Paleozoic Era III  
Reading: Chap. 14
- Apr. 5 The Late Paleozoic Era I  
Reading: Chap. 15  
**LAB:** Paleontology II Micropaleontology, Paleobotany, Vertebrate Paleontology (Lab will be a handout)
- Apr. 7 The Late Paleozoic Era II  
Reading: Chap. 15
- Apr. 10 The Late Paleozoic Era III  
Reading: Chap. 15
- Apr. 12 The Late Paleozoic Era IV  
Reading: Chap. 15  
**LAB:** Paleontology III Paleoenvironments & Paleoecology (Lab will be a handout)
- Apr. 14 The Early Mesozoic Era I  
Reading: Chap. 16

**Apr. 15 (Sat.) – western Maryland Field Trip: details TBA**

- Apr. 17            **MIDTERM EXAM II**
- Apr. 19            The Early Mesozoic Era II  
Reading: Chaps. 16  
**LAB:** Interpretation of Geological Maps (Read **DEH** Lab 15L this Lab is a handout, but we will do Lab 15 during the next two weeks)
- Apr. 21            The Cretaceous Period I  
Reading: Chap. 17
- Apr. 24            The Cretaceous Period II  
Reading: Chap. 17
- Apr. 26            The Cretaceous Period III  
Reading: Chap. 17  
**LAB:** Geologic Maps and Interpretation of Earth History in Selected Regions pt. 1 (**DEH** Lab 15)
- Apr. 28            The Paleogene Period I  
Reading: Chap. 18
- May 1              The Paleogene Period II  
Reading: Chap. 18
- May 3              The Neogene Period I  
Reading: Chap. 19  
**LAB:** Geologic Maps and Interpretation of Earth History in Selected Regions pt. 1 (**DEH** Lab 15)
- May 5              The Neogene Period II  
Reading: Chap. 19
- May 8              The Quaternary Period I  
Reading: Chaps. 19-20
- May 10             The Quaternary Period II: To the Anthropocene and Beyond!  
Reading: Chap. 20  
**LAB: Lab Exam 2 (Concentrates on labs from March 8 onward)**
- May 17 (**WEDNESDAY**) Final Exam, PLS 1113, 8:00-10:00 am