GEOL 331: Principles of Paleontology
Fall Semester 2012

Lecture: PLS 1158 1:00-1:50 pm MWF
Lab: GEO 2107 2:00-5:00 pm Th
Course Website: http://www.geol.umd.edu/~tholtz/G331/

INSTRUCTORS:
Dr. Thomas R. Holtz, Jr.  Dr. John W. Merck, Jr.
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E-mail: tholtz@umd.edu  E-mail: jmerck@umd.edu
Office Hours: Tue 8:30-11 am or by appointment  Office Hours: Thurs 12-2 pm (GEO 1119) or by appointment

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 or Dr. Merck. You will be held responsible for following all requirements of this syllabus.

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

Grade:

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Test 1</td>
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<td>Test 2</td>
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<tr>
<td>Final</td>
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<tr>
<td>Paper</td>
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<td>Report I</td>
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<td>Report II</td>
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<tr>
<td>Labs</td>
<td>15%</td>
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<td>Lab Practical I</td>
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<tr>
<td>Lab Practical II</td>
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No separate extra credit assignments are planned for this course.

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.

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

- Identify major groups of fossilizing organisms from hand samples.
- Interpret standard paleontological charts and plots (e.g., biostratigraphic range charts; phylogenies and cladograms; diversity analyses; etc.).
- Critically evaluate paleontological analyses in the technical literature.

Required Texts:

Additional online readings are linked to the syllabus on the website.

Website: http://www.geol.umd.edu/~tholtz/G331/
The Website contains a copy of the course policies, the syllabus, lecture notes, copies of the handouts, paleontology-related web links, and other features. Please feel free to utilize this resource, and email Drs. Holtz & Merck with any suggestions on improving this resource.

http://elms.umd.edu/  Course ID: 201208_GEOL331_THOLTZ
The ELMS Blackboard 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: Academic integrity: 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://www.studenthonorcouncil.umd.edu/whatis.html

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://www.studentconduct.umd.edu/Info/Students/AcadHonorPledge.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).”

Academic Accommodations: If you have a documented disability, you should contact Disability Support Services 0126 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://www.counseling.umd.edu/DSS/receiving_serv.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 (September 12). 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.

Other: All work on tests, assignments, exams, etc. must be your own. Although group study can be very useful, make sure that all your work you turn in is your own.

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 University of Maryland Undergraduate Catalog). Only those students excused for these causes will be eligible for a make-up exam.

Throughout the course there will be a series of online tests using the ELMS system. Please make certain that you stay current with these: once the deadline has passed, you will not be able to make them up and you will receive a 0 for that test. 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).

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 & Merck will contact students via ELMS in order to inform them concerning delays of due datess for projects to be handed in or for exams: typically these will be shifted until the next available class date.
Keep up with the online notes! Although the format of the lectures and the notes do not always match, these readings are important as well. Readings should be done prior to the classtime they are list

**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 Drs. Merck & 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 2012 courses between Tuesday, November 27, and Wednesday, December 12. Students can go directly to the website (www.courseevalum.umd.edu) to complete their evaluations, beginning November 27. 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

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
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<tbody>
<tr>
<td>Aug. 29</td>
<td>Introduction: Why Study Fossils?</td>
<td>B&amp;H Chap. 1</td>
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<tr>
<td>Aug. 30</td>
<td>LAB: Analytical: Fossilization and Taphonomy (M&amp;R Chap. 1)</td>
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<td>Aug. 31</td>
<td>Taphonomy I: Properties and Habitats of Good Fossil Makers</td>
<td>B&amp;H Chap. 3</td>
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<td>Sept. 3</td>
<td>LABOR DAY – NO CLASS</td>
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<td>Sept. 5</td>
<td>Taphonomy II: Fossils as Sedimentary Particles &amp; Taphonomic Filters</td>
<td>B&amp;H Chap. 3</td>
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<td>Sept. 6</td>
<td>LAB: Descriptive: Micropaleontology (M&amp;R Chap. 13)</td>
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<td>Sept. 7</td>
<td>Taphonomy III: Modes of Fossilization &amp; Lagerstätten</td>
<td>B&amp;H Chap. 3</td>
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<td>Sep. 10</td>
<td>Biostratigraphy I</td>
<td>B&amp;H Chap. 2</td>
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Sept. 12  Biostratigraphy II & Trace Fossils I  
          Reading: B&H Chaps. 2, 19

Sept. 13  LAB: Analytical: Biostratigraphy and the PaleoDB

Sept. 15  Trace Fossils II  
          Reading: B&H Chap. 19

Sept. 17  Variation and Fossil Individuals

Sept. 19  Fossil Species and Species Criteria

Sept. 20  LAB: Descriptive: Sponges and Cnidaria (M&R Chaps. 3-4)

Sept. 21  Alpha Taxonomy & Identifying Fossils

Sept. 24  Macroevolution and the Fossil Record  
          Reading: B&H Chap. 5

Sept. 26  Extinctions & Mass Extinction  
          Reading: B&H Chap. 7  
          Report I due

Sept. 27  LAB: Descriptive: Bryozoa and Brachiopoda (M&R Chaps. 5-6)

Sept. 28  Cladistics I: Methods of Phylogenetic Analysis  
         Reading: B&H Chap. 7 & online

Oct.  1  Cladistics II: Phylogenetic Inferences  
          Reading: B&H Chap. 7 & online

Oct.  3  Evo-Devo, Deep Homology, and the Origins of Evolutionary Novelty

Oct.  4  LAB: Analytical: Taxonomy and Phylogenetics

Oct.  5  TEST I

Oct.  8  Paleocology, the Fundamental Niche, and Extinction  
          Reading: B&H Chap. 4

Oct. 10  Paleoenvironmental Analysis & Biochemical Paleontology  
          Reading: B&H Chap. 4

Oct. 11  LAB PRACTICAL I (Covers Aug. 30 through Oct. 4)

Oct. 12  Faunal Analyses: Paleontology of Communities  
          Reading: B&H Chap. 4

Oct. 15  Lineage-Based Analyses: Trends in Taxa

Oct. 17, 19 No lectures: Annual Meeting of the Society of Vertebrate Paleontology

Oct. 18  LAB: Analytical: Paleocology & Paleoenvironmental Analysis [Do from handout]

Oct. 22  Functional Morphology
Oct. 24  The Oldest Fossils & Prokaryote Fossil History
Reading: B&H Chap. 6

Research Topics Due

Oct. 25  LAB: Descriptive: Mollusca (M&R Chap. 9)

Oct. 26  Fossil Protists
Reading: B&H Chap. 9

Oct. 29  Precambrian Macrofossils: the Garden of Ediacara and the Long Fuse of the Cambrian Explosion
Reading: B&H Chap. 10

Research Topics Due

Oct. 31  Poriferans and Cnidarians
Reading: B&H Chap. 11

Nov. 1  LAB: Descriptive: Arthropoda (M&R Chap. 8)

Nov. 2  Basal Bilateralians
Reading: B&H Chap. 12

Nov. 5  Bryozoans, Brachiopods
Reading: B&H Chap. 12

Nov. 7  Mollusks I: Basal Forms through Gastropods
Reading: B&H Chap. 13

Nov. 8  LAB: Descriptive: Echinodermata & Graptolithina (M&R Chaps. 7, 10)

Nov. 9  Mollusks II: Cephalopods & Bivalves
Reading: B&H Chap. 13

Nov. 12  TEST II

Nov. 14  Arthropods I: Basal forms, Myriapods, Arachnomorphs
Reading: B&H Chap. 14

Research Initial Bibliography Due

Nov. 15  LAB: Descriptive: Vertebrate Paleontology (M&R Chap. 11)

Nov. 16  Arthropods II: Pancrustacea
Reading: B&H Chap. 14

Nov. 19  Introduction to Deuterostomia: Basal Deuterostomes, Hemichordates, Basal Echinoderms
Reading: B&H Chap. 15

Nov. 21  Echinoderms II: Crinoids and Eleutherozoans
Reading: B&H Chap. 15

Nov. 22-23  Thanksgiving Recess: enjoy your roasted dinosaur

Nov. 26  Basal Chordates and the Origin of Vertebrata
Reading: B&H Chap. 16
Nov. 28  Vertebrate Paleontology I: Paleoichthyology  
Reading: B&H Chap. 16

Nov. 29  LAB: Descriptive: Paleobotany (M&R Chap. 12)

Nov. 30  Vertebrate Paleontology II: Fossil Tetrapods  
Reading: B&H Chap. 17

Dec. 3   Paleobotany I: Spore Plants & the Colonization of Land  
Reading: B&H Chap. 18

Dec. 5   Paleobotany II: Seed Plants  
Reading: B&H Chap. 18

Dec. 6   LAB: PRACTICAL II (Covers Oct. 18 to Nov. 29)

Dec. 7   Student Presentations  
PAPERS DUE!

Dec. 10  The Future of Paleontology  
Reading: B&H Chap 20

Dec. 14  (Friday) FINAL EXAM, PLS 1158, 1:30-3:30 pm