GEOL 305 SYLLABUS
PALEOBIOLOGY
Fall Semester 2008

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Office Hours: Monday, 2:00-3:00
Tuesday, 9:00-10:00
or by appointment

Wednesday, 10:00-11:00
Thursday, 11:00-12:00
or by appointment

Time and Place: Lectures: Monday, Wednesday, and Friday, 12:40-1:30 Halbouty 327
Labs: Wednesday, 3:00-5:50, Halbouty 156
Tuesday, 11:10-2:00, Halbouty 156

Course Description: Credits: 3. Principles of paleobiology; study of organisms important in the marine fossil record; application of paleontology to geologic problems. **Prerequisite:** GEOL 106 or approval of instructor.

Objectives: Fossils are a fundamental component of the rock record and provide the only direct evidence of past life on Earth. They provide basic information on questions of geological interest like climate change, tectonic plate motion, and relative timing of geological events. They also address questions of biological interest like the nature of mass extinction, the origin of biological novelty, and the history of biodiversity.

In this course, students will learn to identify and interpret the main groups of invertebrate fossil taxa. In addition to the characteristics of the groups themselves, students will learn how paleontologists use fossils to address questions and solve problems of interest to geologists and biologists.

Textbooks: Boardman, R.S., Cheetham, A.H., and Rowell, A.J., eds., 1987, *Fossil Invertebrates*. Blackwell Scientific Publications, 713 p. (Optional; Out of Print)

Foote, M. and Miller, A.I., 2007, *Principles of Paleontology, 3rd ed*. W.H. Freeman & Co., 354 p. (Optional)

Grading:

Mid-semester Exam:	15%
Final Exam:	20%
Labs:	30%
Mid-Semester Practicum:	15%
Final Practicum	20%

Grades will be assigned on the following scale: A ≥ 90%, B ≥ 80%, C ≥ 70%, D ≥ 60%, F < 60%.

(Quizzes, Assignments, Participation, and Attitude will sum to the equivalent of one lab assignment.)

No make-ups will be given without prior approval of the professor (by phone or e-mail with at least 24 hours notice). Make-ups must be taken no later than one week after the original exam or quiz. Lab and homework assignments will be due at the beginning of class one week after they are assigned unless otherwise specified; 25% of the assignment's credit will be lost for each day (24 hour period) late until no credit will be given (at which point the assignment will not be accepted).

Field Trips: There are three **MANDATORY** field trips planned for this class. Two will take place during the regular lab time (one to the Brazos River and another to the IODP facility on the Texas A&M campus) and one will take a full day scheduled outside of the normal class period. Please dress appropriately.

AGGIE HONOR CODE:

"An Aggie does not lie, cheat, or steal or tolerate those who do."

For more information, see Honor Council Rules and Procedures.
http://www.tamu.edu/aggiehonor

Academic Integrity: Academic integrity is an essential element of the academic life of a university. It enhances the quality of education and celebrates the genuine achievements of others. It is, without reservation, a responsibility of all members of the Texas A&M University Community to actively promote academic integrity. Apathy or acquiescence in the presence of academic dishonesty is not a neutral act: failure to confront and deter it will reinforce, perpetuate, and enlarge the scope of such misconduct. Commission of any of the following acts shall constitute scholastic dishonesty: inappropriately acquiring information, inappropriately providing information, plagiarism, conspiracy to cheat, fabrication of information, and violation of departmental or college rules. This listing is not exclusive of any other acts that may reasonably be said to constitute scholastic dishonesty. Punishments for scholastic dishonesty may include the following: appropriate grade penalty up to and including an F in the course, letter of reprimand, conduct probation, expulsion, dismissal, or suspension. See section 20 of the Texas A&M University Student Rules (the source of this blurb) for a more complete statement on the definition and possible consequences of academic dishonesty. More information can also be obtained from Student Conflict Resolution Services (http://studentlife.tamu.edu/scrs/).

Plagiarism: As commonly defined, plagiarism consists of passing off ideas, words, writings, etc. that belong to another as one's own. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. (Please see http://www.tamu.edu/aggiehonor)

Americans with Disabilities Act (ADA) Policy Statement: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Cain Hall or call 845-1637.

Schedule of Topics

(Subject to change at instructor's discretion)

Week 1

M	8/25	Paleontology: Relevance and Important Questions
W	8/27	Biofacies and Depositional Environments
F	8/29	Group: Mollusca I (Bivalves)
Lab 1		Principles of Fossil Description and Identification

Week 2

M	9/1	Physical and Biological Processes of Preservation
W	9/3	Chemical Processes of Preservation
F	9/5	Group: Mollusca II (Gastropods, Cephalopods, etc.)
Lab 2		Field Trip: Eocene of the Texas Gulf Coast

Week 3

M	9/8	Time Averaging
W	9/10	Species and Populations: the Units of Evolution
F	9/12	Group: Trace Fossils
Lab 3		Taphofacies and Environmental Interpretation in the Lab (GOM Eocene)

Week 4

M	9/15	Darwinian Natural Selection: the Mechanism of Evolution
W	9/17	Adaptation, Form, and Function
F	9/19	Group: Echinodermata I (Echinoids, Asteroids, etc.)
Lab 4		Branching Models of Diversification

Week 5

M	9/22	Analytical Morphospace
W	9/24	Speciation: the New Synthesis
F	9/26	Group: Echinodermata II (Crinoids and Blastoids)
Lab 5		Modeling the Growth of Clonal Organisms

Week 6

M	9/29	Species Selection and Punctuated Equilibrium
W	10/1	Taxonomic Rules of the Game
F	10/3	Group: Porifera
Lab 6		**Mid-Semester Practicum**

Week 7 (GSA National Meeting 10/4-10/9)

M	10/6	GSA – No class
W	10/8	**Mid-Semester Exam**
F	10/10	Group: Cnidaria
Lab 7		No Lab – Field Trip on 11/15

Week 8

M	10/13	Inferring Phylogenetic Relationships
W	10/15	Cladistics
F	10/17	Group: Bryozoa
Lab 8		Principles of Cladistics

Week 9

M	10/20	Biodiversity Through Time
W	10/22	Background Extinction
F	10/24	Group: Brachiopoda
Lab 9		Rarefaction and Measurement of Diversity

Week 10

M	10/27	Classical Biostratigraphy
W	10/29	Graphic Correlation
F	10/31	Arthropoda I (Trilobites)
Lab 10		Graphic Correlation

Week 11

M	11/3	Confidence Intervals on Biostratigraphic Ranges
W	11/5	Mass Extinction
F	11/7	Arthropoda II (Crustaceans etc.)
Lab 11		Field Trip: Using IODP Fossil Data to Relate Ancient Climate and Planktonic Turnover

Week 12

M	11/10	Evolutionary Faunas
W	11/12	Growth and Development of Organisms
F	11/14	Graptolithina
Lab 12		Measuring Taxonomic Turnover: IODP Redux

Saturday Field Trip (11/15) -- Paleoecology of a Cretaceous Sea

Week 13

M	11/17	Interpreting the Waco Lake Research Area Section
W	11/19	Origin and Early Evolution of Metazoans
F	11/21	Origin and Early Evolution of Metazoans
Lab 13		**Final Practicum**

Week 14

M	11/24	Evolutionary Developmental Biology and the Origin of Novelties
W	11/26	Thanksgiving Break – No class
F	11/28	Thanksgiving Break – No class
		Thanksgiving Break – No Lab

Week 15

M	12/1	Review for Final Exam

Final Exam: Monday, 12/8, 10:30 a.m.-12:30 p.m.