SYLLABUS:
GEOLOGY 230 PALEOBIOLOGY **SPRING TERM 2009**

Dr. Clinton A. Cowan

Labass's: Aaron Fricke '09, Lilly Betke-Brunswick '11, Masaru Nobu '11, and Andrew Walters '11. Their office hours and location will be posted on the chalk board in the back of the class.

Office Hours: Mudd 60 anytime *except* immediately before class or lab
For appointments, please use email.

Grading:
20% Midterm Exam
20% Fossil ID Exam
20% Final Exam
20% Essay
15% Major Lab Report
5% Laboratory Participation

A Geological Time Scale Quiz is compulsory (you will retake the quiz as many times as needed to obtain a 95% score).

Texts:
History of Life by Richard Cowen
Variety of Life by Colin Tudge (optional, great reference for the future) Also available in course folder as searchable PDF.
Fossils at a Glance by Clare Milsom and Sue Rigby (optional)

Course Structure:

Our curriculum does not permit us to offer the number of separate courses necessary to do justice to the broad topic of Paleontology (for example, Earth History, Invertebrate Paleontology, Vertebrate Paleontology, Paleobiology, Paleoecology, Paleoclimatology, etc.), so we try to do a lot in this single course. The lectures will loosely follow the textbook *The History of Life* by Richard Cowen of The University of California Davis, which is (in part) why the course title is 'Paleobiology', rather than 'Paleontology'. This will allow us to delve into macroevolution and important (or simply really cool) biological innovations that occurred during the evolution of life on Earth, and the impacts those innovations had on the evolving Earth System. The major changes in the Earth System are, however, worth investigating in their own right, and we will touch on a few of these great trends and events. The mechanics of microevolution are covered in Mark McKone's *Evolution* course, and I highly recommend that course to those interested in natural history and Paleo topics broadly. The laboratories in this course will cover topics more traditionally seen in a course on Paleontology, and will include emphasis on the physical

understanding of form and function, as well as fossilization and phylogeny, but not so much on the keying-out of fossils to the species level. You will largely be responsible for learning the basics of marine invertebrate zoology and paleontology on your own (with assistance from the Labasses) using our Museum collection. The rational behind the "Fossil Identification Exam" is that you can use this exercise to begin what is hopefully a life-long appreciation for the variety of life, and the different ways of living.

Week 1

M Early Earth (1)

W Cells & Energy Sources (1)

F Earliest Fossils (2)

Lab: Ammonite Sutures (for essay)

Week 2

M Stromatolites & BIF (2)

W Sex, Evo, Phylogeny (3)

F Evo Metzoa (4)

Lab: Rocks & Proxies

Week 3

M Evo Metazoa, con't (4)

W Snowball & Hox (4)

F Ediacaran (5)

Lab: Fossils & Fossilization

Week 4

M Cambrian Explosion (5)

W Burgess & Chengjiang (5)

F Changing Life/World (6)

Lab: Case Study

Week 5

M Midterm Exam

W Fishes & Tetrapods (8,9)

F Plants (8,9)

Lab: Case Study con't

Week 6

M No Lecture (Field trip)

W No Lecture (Field trip)

F TBA

Lab: No Labs this week

Week 7

M Diaspids (11, 12)

W Dinosaurs (11, 12)

F K-T Boundary (16)

Lab: Local Outcrops

Week 8

M Flight & Feathers (13)

W Earth Modernization (14)

F Mammals (15)

Lab: Local Outcrops

Week 9

M The Cenozoic (17)

W Evo & Geography (18)

F Primates, Humans (19, 20)

Lab: Free time to study fossils

Week 10

M Pleistocene (21)

W Complexity

Lab: Fossil ID Exam