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Spring 2-1-2017

GEO 106N.01: History of Life

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Course Syllabus - Spring 2017

GEOLOGY 106N - HISTORY OF LIFE

INSTRUCTOR: George Stanley Email: george.stanley@umontana.edu

Required Text: R. Cowen - THE HISTORY OF LIFE, 5th Edition (available from Bookstore)

OFFICE: C.H. Clapp 302
TELEPHONE: 243-5693
Office hours: T/Th 1-3pm or by appointment

Date	Subject	Assigned Chapter Reading
Jan 23	Introduction to the course	---
25	Evolutionary thought and Darwin	Bower article + assignment
27	Humans, present, past and future	Barnoski et al + (online Moodle)
30	The origin of life and how paleobiology works	1
Feb 01	Earth's earliest rocks and requirements of life	2
03	Practical 1: Earliest life	2
06	The origin of sex: Eukaryotes	3
08	Metazoans: Start of multicellular life	4
10	Metazoan radiation (Practical 1 due)	5
13	The Cambrian Burgess Shale and Chengjiang biota	5
15	Practical 2 Metazoan life	5
17	Practical 2, continued	5
20	President's Day – no class meeting	--
22	Life in a changing world	6
24	Mass Extinction	6
27	The first vertebrates (Practical 2 due)	7
Mar 01	Life moves to the land	8
03	Practical 3 Vertebrates & Land	7
06	Practical 3, continued	7 & 8
08	Review of signposts and highlights	
10	Tetrapods and amniotes (Practical 3 due)	9
13	Mid-Term exam on above topics	--
15	Thermoregulation	10
17	Practical 4: Thermoregulation	10
20	SPRING BREAK – no meeting	
22	SPRING BREAK – no meeting	
24	SPRING BREAK – no meeting	

27	The Triassic takeover	11
29	Dinosaurs (Practical 4 due)	12
31	Dinosaurs, continued	12
Apr 03	Practical 5 Dinosaurs	12
05	Practical 5 , continued	12
07	Origin of flight	13
10	Mammals and their origin	15
12	What killed dinosaurs? (Practical 5 due)	16
14	Mammals and Cenozoic guilds	17
17	Cenozoic guilds continued	17
29	Practical 6: Mammals	15 & 17
21	Practical 6 continued	15 & 17
24	Ancient paleogeography & evolution	18
26	Primates (Practical 6 due)	19
28	Hominids toward humans	20
May 01	Practical 7: Hominids	20
03	The Ice Ages	21
05	Course review (Practical 7 due)	--
11	Final exam scheduled for 3:20-5:20 p.m.	

GRADING BASIS FOR COURSE

First exam (50 minutes)	20%
Seven practical exercises (one may be dropped)	30%
Chapter questions	10%
Final exam (comprehensive)	40%

The web site on page 1 of your book has supplementary material. Also see:

<http://www-geology.ucdavis.edu/~cowen/HistoryofLife/>

Check it out as they contain useful information keyed to your text chapters.

Course Description: This non-majors course is an introduction to paleobiology and the fascinating history of life on our planet. The objectives are to gain an understanding of the principles of evolution and earth history. Emphasis will be on observation and analysis and applications in interpreting and understanding the history of life.

Chapter questions: Will test your understanding of the reading assignments. Due **before the start of class.**

Practicals: These “lab” experiences provide “hands-on” work with fossils, exhibits, rocks and earth materials and follow topics covered in lectures and readings. Due dates are in syllabus. To prepare,

read assigned chapters and distributed materials. Practicals are due on the class meeting indicated in the syllabus. They must be physically turned in **before the start of the class** on the date indicated. After that date points are deducted for being late. Without approval, no credit is given one week beyond due date. You are encouraged to work together to learn but your completed practical must be your own work for which you are graded. If you have an excused absence, please give it to the instructor. Be aware that copying from another student's work in all assignments is a form of academic dishonesty and will not be tolerated (Student Conduct Code, section 5A).

The University of Montana Student Conduct Code

Academic dishonesty is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at:

http://www.umt.edu/vpsa/policies/student_conduct.php

Attendance: Attendance of 80% of scheduled classes is required for successful completion of the course. For illness or a valid excused absence, please inform instructor ahead of class.

UM policy: "Students are expected to attend all class meetings and complete all assignments for the course. Instructors may excuse brief and occasional absences for reasons of illness, injury, family emergency, religious observance or participation in a University sponsored activity. (University sponsored activities include for example, field trips, ASUM service, music or drama performances, and intercollegiate athletics.) Instructors shall excuse absences for reasons of military service or mandatory public service."

The number one reason for a poor grade in this class is non-attendance and missed practicals! If you have an excused absence and miss assignments **you must make timely arrangements with instructor for making them up.**

Final course grades will be assigned as follows:

A 93-100%	B 83-86%	C 73-76%	D 63-66%
A- 90-92%	B- 80-82%	C- 70-72%	D- 60-62%
B+ 87-89%	C+ 77-79%	D+ 67-69%	F 59 or below

Please note: You must take the class with traditional grading to apply it towards the Gen Ed Natural Science laboratory experience requirement. The minimum grade of C- must be earned for the course to be applied for the Gen Ed requirement.

Students with disabilities may request reasonable modifications by contacting me. The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. "Reasonable" means the University permits no fundamental alterations of academic standards or retroactive modifications.

Learning Outcomes of the Course

Upon successful completion of the course, you will be able to:

1. **Analyze the scientific method and explain how it fits available evidence.** All sciences share a common methodology of attaining knowledge to explain the natural world. Can you analyze a discovery in the fossil record and construct a hypothesis to explain it?
2. **Learn the concept of geologic time and the geologic time scale.** You will learn about geologic or deep time, comparable to light years in deep space. Can you relate to deep time and explain the difference between absolute time and relative dating methods?
3. **Recognize the organisms and their extensive fossil record.** In addition to dinosaurs, the record of life is replete with extraordinary and strange creatures. You will learn about the evolution of some of these. Can you give an example of such creatures from the Early Cambrian time?
4. **Appreciate the major events in the history of life.** “Thematic highlights” and “signposts” both can be identified and placed at their proper places on the geologic timescale to help us better understand the significance of events in the history of life. Can you give examples of each?
5. **Understand organic evolution?** You will be able to explain the fact of evolution and the lines of evidence that support it. Can you explain evolution and give the lines of evidence that Darwin marshalled to convince his fellow scientists of the fact of evolution?
6. **Understand mass extinctions and hypotheses to explain them.** How did they affect the geologic time scale and how many of such extinctions changed the history of life?
7. **Assess and evaluate competing hypotheses regarding the origin of life on Earth.** Scientists are still arguing about these. To illustrate how science is supposed to work, can you compare and analyze the controversies and arguments and understand how they were settled in geobiological research?
8. **Follow the development of life during the history of the Earth.** Can you review critical steps in evolution during the transition of major fossil groups in the geologic record and understand critical turning points in the history of life?
9. **Understand how shifting continents and changing climate controlled past life.** Organisms respond to natural selection when the environment changes. Can you give some examples of how life has responded to shifting continents and climate during the billions of years of the history of life?
10. **Appreciate human’s place in the world today.** Where did we come from and where are we going? What is the purpose of human existence? Are humans the inevitable end-product of 3.5 billion years of evolution? Are we altering the climate and Earth to cause a mass extinction event like those of the geologic past?