

Paleontology (ERTH 2312) Winter 2019

Course Outline

Instructor: Dr. R. Timothy Patterson
Office Hours: Steacie 243; By appointment
Telephone: 520-2600 ex 4425,
E-Mail: Tim.Patterson@carleton.ca
WWW: <http://mypage.science.carleton.ca/~tpatters/>

Introduction:

During the last few decades paleontology has developed into the most dynamic subdiscipline of Earth Sciences. One can scarcely pick up a newspaper or turn on a television set without being exposed to some aspect of this burgeoning field; ranging from the Burgess Shale, to warm blooded dinosaurs to the evidence of potential fossils on Mars. Biogenic processes have affected the evolution of our world more than any other physical process. In this course you will delve into principles of such subdisciplines as systematics, paleoecological community structure, taphonomy, functional morphology, and the processes of evolution and extinction. This information will not only allow you to utilize fossil data more intelligently when addressing geological problems (eg. basin analysis), but will provide you with a better understanding of how and why our world evolved (and is still evolving) the way it did.

The lectures for EARTH 2312 (Paleontology) and EARTH 2316) Paleoecology are identical. EARTH 2312 is designed for Earth Science majors and students in the Faculty of Science who require laboratory classes while EARTH 2316 is designated for students from other faculties without the laboratory requirement.

Text Book: Benton, M.J. & Harper, D.A.T. 2009. Introduction to Paleobiology and the Fossil Record. Wiley-Blackwell, 592 p.

Lectures: Thursday 3:35AM-5:25 AM, Rm. 3120 Herzberg

Labs (ERTH 2312): A01 Thursday - 8:35-11:25 PM, Rm. 2130 Hertzberg
A02 Tuesday - 2:35-5:25 PM, Rm. 2130 Hertzberg

TAs: Braden Gregory <bradengregory@cmail.carleton.ca>
Veronica Mazella <VeronicaMazzella@cmail.carleton.ca>
Nawaf Nasser <nawaf.nasser@carleton.ca>
Riley Steele <RileySteele@cmail.carleton.ca>

Grading

Examination 1: (20%)

Monday Feb 14th, at a location TBA.

Laboratory Exercises: (20%)

These are due at the end of each laboratory session.

Laboratory Examination: (10%)

There will be a final laboratory examination at date TBD.

Term Paper: (15%)

Due March 14th – at beginning of class. 20% reduction in value for each day late. See detailed instructions below.

Term paper topic subject due February 7th – sign-up sheet available in class. Need to clear subject with instructor. 20% penalty off final value of paper for late determination of topic.

In-class Group Poster Presentations (March 28th and April 4th): (10%)

Groups of four students will make 15-minute presentations centered on a poster that each group will collectively develop. Groups to be established by March 7th – sign-up sheet available in class. Need to clear subject with instructor. 20% penalty off final value of presentations for late determination of groups and topics.

Final Examination: (25%)

In class. Thursday, March 21st, Location TBA

*No outside study aids (calculators, notes) will be allowed for any exams. Any materials required for the exams will be provided by the instructor.

Attendance in EARTH2312 is Mandatory During Group Poster Presentations

Attendance will be taken at the beginning of the classes where posters are being presented. Two marks of your total grade will be taken off for each absence without medical note.

Plagiarism

The University's Senate defines plagiarism in the regulations on instructional offences as: "to use and pass off as one's own idea or product work of another without expressly giving credit to another". Borrowing someone else's answers, unauthorized possession of tests or answers to tests, or possession of material designed in answering exam questions, are all subject to university policy regarding instructional offences.

Requests for Academic Accommodations

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

For Students with Disabilities:

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. carleton.ca/pmc

For Religious Obligations:

Students requesting academic accommodation on the basis of religious obligation should make a formal, written request to their instructors for alternate dates and/or means of satisfying academic requirements. Such requests should be made during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist, but no later than two weeks before the compulsory event. Accommodation is to be worked out directly and on an individual basis between the student and the instructor(s) involved. Instructors will make accommodations in a way that avoids academic disadvantage to the student. Students who have questions or want to confirm accommodation eligibility of a religious event or practice may refer to the Equity Services website for a list of holy days and Carleton's Academic Accommodation policies, or may contact an Equity Services Advisor in the Equity Services Department for assistance. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Please note: students who choose to wear head coverings that obscure their facial features will be required to produce a student identity card showing their true likeness, which must be shown to a proctor of the same sex. They will be asked to temporarily remove themselves from the examination room to a private area prior to the beginning of the examination where they will be required to reveal their faces to a proctor of the same sex. The instructor needs to be advised of this requirement at least one week ahead of the examination to ensure that an appropriate proctor can be obtained.

Pregnancy obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Medical Certificates:

Please note that in this course on all occasions that call for a medical certificate you must use (or furnish the information demanded in):

www1.carleton.ca/registrar/ccms/wp-content/ccms-files/med_cert.pdf

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>

For more information on academic accommodation, please contact the departmental administrator or visit: students.carleton.ca/course-outline

ERTH 2312 Term Paper Guidelines and Grading Scheme

This document supplements the information provided above. Detailed grade breakdown for each component of the term paper will be provided as a separate document on the CULearn site.

Term paper itself:

Term paper topic is to be chosen in consultation with the instructor. Term papers submitted without topic being approved will not be graded.

Term paper is to be 5 pages single spaced, with 2.5 cm margins all around and paginated. Additional pages may be included for abstract, references, figures and tables as required. Font is to be 12-point Times or Times-Roman. It is to be submitted electronically in MS Word.

Term paper is due on or before March 12th, 2018 at the beginning of class. There will be 20% deduction in value for each day that the term paper is late.

The layout of the term paper is to follow the outline below:

Title and Abstract:

Clear and concise. Clearly outlines the contents of the paper. The Abstract should be on a page by itself.

Paper Body:

While a complete, in-depth analysis of the topic is not expected (that would be a dissertation or book), a superficial discussion is not sufficient. The term paper should be a thoughtful discussion of your topic. I want to know by reading the paper that you learned some things and thought seriously about the topic. Organize your paper in an organized way. In a survey paper such as you are writing begin with a clear introduction, followed by background and then a discussion of the main points that you wish to cover. It may be useful to subdivide the various parts of the paper with subheadings. Be concise. Wordiness distracts from the points that are being made and wearies the reader. Rephrase or use parenthesis to indicate the work of others. Do not copy text into your document. It is an indication of plagiarism, easily detectable and is a serious academic offence.

Fully cite your sources as you develop your ideas. Class notes do not qualify as citations. Do not use “grandfathered” citations. Go to the original source! Spelling errors are also distracting. Be sure and spell check the document prior to submission.

Conclusions:

Clearly and briefly summarizes the main points made in the paper.

References:

Are all references listed in bibliography cited in text? And are all references cited in text listed in the bibliography? The Internet is a wonderful source of information. However, many non-academic sites are commonly not screened and refereed as are academic journals and publications. If you do cite web pages, give the exact URL address. In the case of online journal articles such as those found in the online peer-reviewed journal *Palaeontologia Electronica*, cite them as though they were in printed form. No specific referencing style is set for the term paper. However, it should follow styles typically found in Earth Science journals. Discuss with instructor for more information.

Figures and Tables:

Earth Science papers are often replete with many figures and data tables. If you include figures from elsewhere clearing reference the source. Figures should be clear with the main points that you wish to make based on them easily distinguishable. It might be useful in some cases to draft your own figure. Figures and Tables require captions that are to be printed on the same page. Figures and Tables are to be placed in order at the end of the paper with one figure and table per page, not interspersed through your manuscript. When you cite figures in the text they should be in order. The progression should be Fig 1, 2, 3, 4, 5 etc. Do not cite Figure 3, then 5, then 1 etc.

ERTH 2312 Oral Presentation and Poster Guidelines

Groups of four students (group size may vary if there are an odd number of students in class) will collectively choose a suitable paleontological topic to be developed in

consultation with course instructor.

Format: These oral presentations and accompanying poster work will build on themes covered during the course, or from appropriate additional topics, and will help you to develop team-working, analytical and interpretational skills. They will be assessed by teaching staff in the field. All group members are expected to contribute fully and equally to data collection and oral delivery.

Delivery method: Groups will be asked to give an oral presentation (15 minutes) and an accompanying poster and will have to answer 2-3 questions. Printing of posters on a plotter is discouraged due to the high cost. However, components of the poster can be printed and pasted on to a poster board. Details of how to construct a good poster will be discussed in class.

Lecture Topics

Nature of the Fossil Record.

Assessment of the preservability and completeness of the fossil record. How good a gauge of previous ecosystems is the fossil record?.

Introduction to Ecology and Paleoecology.

Basic concepts of ecology (food webs, trophic pyramids, ecologic niches, etc.). A discussion of the applicability of community studies developed for living organisms "dynamic in space and static in time" to fossils "static in space yet dynamic in time".

Limiting Factors and Biogenic Controls.

Discussion of the effects of "limited" and "nonlimited resources" (physical, chemical, and biologic properties of the environment) that limit the distribution and abundances of particular species. Examples are provided as to how concepts of ecologic processes may be applied to the fossil record (eg. basin analysis).

Life Habits and Functional Morphology.

Discussion of the modes of life of species within their respective habitats. Analysis of fossils provide clues regarding such factors as a fossil organisms life orientation, mobility, food gathering mechanism, and reproductive strategies. This information can in turn be applied to an analysis of the depositional environment.

The Life Revolution.

Discussion of the development of Precambrian ecosystems and the explosion of life in the Eocambrian and Cambrian.

Succession in the Phanerozoic.

Overview of long and short term ecologic succession through the Phanerozoic with emphasis on reef and soft bottom communities.

Systematics.

Discussion of the necessity for a firm grounding in Linnéan systematics for any sort of

paleontological analysis. Overview of varying approaches to the classification of organisms (natural and artificial Linnéan classification, numerical taxonomy, cladistics, etc.)

Evolution.

Overview of macro- and micro- evolutionary processes contrasting various models presently in vogue (phyletic evolution, punctuated equilibrium, adaptive walks on rugged landscapes).

Extinction.

Overview of processes thought to control the elimination of taxa from the biosphere (Introduction to concepts of background extinctions, fear and loathing, mass extinction).

Mass Extinction and Cyclicality in the Phanerozoic.

Discussion of major biotic crises identifiable in the fossil record. Assessment of alleged cyclicality and presentation of models to explain this phenomena.

Course Synthesis.

Detailed analysis of the Phanerozoic fossil record emphasizing major paleoecological events (eg. replacement of scleractinian reef communities by rudistids in the Cretaceous Super Tethyan Seaway).