INSTRUCTOR:
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Office Hours – by appointment

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COURSE OBJECTIVES:
The course will focus on the sedimentary and fossil record of the Phanerozoic which represents the last 542 million years of earth history. The start of the Phanerozoic is demarcated by the marked increase in complexity and diversity of multicellular life on the planet (Cambrian Explosion of Life) which evolved through speciation and extinction events to what we have today. We will examine the lead-up to the Cambrian explosion by examining early life forms in the Neoproterozoic and other important events in earth history (eg. extinction of the dinosaurs). We will study the sedimentary and fossil record - we will examine the fidelity of that record, and its representation of earth history. The course will emphasize the linkages with global climate and sea-level change and will focus on the Paleozoic record of southern Ontario which will be examined in both laboratory and field exercises.

SKILLS DEVELOPMENT:
1. Sedimentary rock identification - siliciclastic and carbonates
2. Sedimentary structure identification and environmental analysis
3. Fossil identification and interpretation
4. Stratigraphic logging and correlation of outcrop sections -- facies analysis
5. Geological map reading

PREREQUISITE:
Earth Science 1G03

TEXT:

LAB KIT:
Mineral ID kits are mandatory for all laboratories and field trips - they can be purchased from the Titles bookstore. Kit includes laboratory and field items for this, and future courses including field camp (3FE3). If you do not have the kit, you will not be permitted on the trip.

LECTURES:
We, Th 4:30 to 5:20 PM CNH B107

LABORATORIES (BSB/343):
L01 Mo 08:30 11:20
L02 Tu 02:30 5:20
L03 Mo 02:30 5:20
L04 Tu 08:30 11:20

LECTURE TOPICS:
A) Basic Principles - The nuts and bolts
1. Introduction to Earth History - Structure of the Geological Timescale - What do the divisions mean? (L1)
2. Plate tectonics and Evolution of Basins - the containers that hold the records (L2)
3. Sedimentary Evidence - rock types, bedding, sedimentary structures - How do we reconstruct the environment? (L3, 4, 5)
4. Stratigraphic nomenclature, formations, contacts, Walther’s law and the Law of superposition, radiometric dating etc. - The language of stratigraphy (L 6)
5. Important Sedimentary Facies - Deltas, shorelines, estuaries, fluvial systems, reefs - What types of deposits and sedimentary structures are associated with these environments? (L7)
5. Important fossil groups and the process of fossilization - What is the evidence of biological life - what are its inherent biases? (L8)

6. Sea-level change and its effect on the stratigraphic record - sequence stratigraphy. What is the effect of sea-level change on the stratigraphic record - facies models. (L9)

B) History Lesson - Major events in the life of the earth

1. Cambrian Explosion and the lead up to complex life (L10)
2. Paleozoic - Old Reefs and Epeiric Basins of N. America - what’s in our backyard, major speciation and extinctions events (L12)
3. Life of the Mesozoic and the K-T extinction - Western Canadian Sedimentary Basin (L13)
4. Cenozoic and modern reefs, Quaternary - Glaciations, Climate periodicity and sea-level, Humans on the landscape (L14)

**** Lecture numbers (e.g. L1) refer to PDF files on A2L ****

LABORATORIES:
Assignments are due in your lab period of the stated week. Bring your Mineral ID kits to every lab period.
ATTENDANCE WILL BE TAKEN AND YOU ARE EXPECTED TO BE PRESENT FOR YOUR DESIGNATED LAB PERIOD. IF YOU MISS THE LAB PERIOD IT WILL BE CONSIDERED MISSED WORK (SEE BELOW). SAMPLES ARE ONLY AVAILABLE IN THE LAB PERIOD.

Laboratory Topics:
1. Clastic Rocks (wk Sept 19th - due wk Sept 26th in lab period)
2. Carbonate Rocks (wk Sept 26th - due wk Oct 3rd in lab period)
3. Sedimentary Structures - Primary and Secondary - What environmental information can they provide? (wk Oct 3rd - due wk Oct 17th in lab period)
4. Paleozoic Fossil Groups and their Taphonomy - Paleoecology and the environment (wk Oct 17th - due wk Oct 24th @ 4:00 PM in assignment dropbox (GBS 2nd floor) on the day of your lab period)
5. Logging a Paleozoic Stratigraphic Section Fieldtrip (SATURDAY Oct 22nd for all lab periods - due wk Oct 31st in lab period)
6. Stratigraphic Correlations (wk Oct 31st - due wk Nov 14th in lab period)
7. Lab Exam Review (wk Nov 14th in lab period)

GRADING:
• Labs 1 to 4: 3% each = 12%
• Labs 5, 6: 8% and 5% = 13%
• Midterm 10% (40 mins in class Oct 27th) - Format: Multiple Choice
• Lab Exam 15% (week of Nov 21st in lab periods) - Format: Bell ringer and based on Labs 1 to 4.
• Final Exam (note: exam is cumulative) 50% - Format: 1/2 Multiple Choice, 1/2 Short Answer

MISSED WORK:
If you are absent from the university for a minor medical reason, lasting fewer than 5 days, you may report your absence, once per term, without documentation, using the McMaster Student Absence Form (MSAF). Absences for a longer duration or for other reasons must be reported to your Faculty/Program office, with documentation, and relief from term work may not necessarily be granted. When using the MSAF, report your absence to ereinhar@mcmaster.ca. You must then contact Dr Reinhardt immediately (within 2 working days) by email at ereinhar@mcmaster.ca to learn what relief may be granted for the work you have missed, and relevant details such as revised deadlines. Please note that the MSAF may not be used for term work worth 30% or more, nor can it be used for the final examination.

Note: 15% per day will be deducted for late lab assignments. For missed midterm - grades will be assigned to the final (i.e. exam = 60% of your final grade).

ACADEMIC DISHONESTY:
Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of a academic dishonesty please refer to http://www.mcmaster.ca/academicintegrity/

The following illustrates only three forms of academic dishonesty:
• Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
• Improper collaboration in group work.
• Copying or using unauthorized aids tests and examinations.
********** The University reserves the right to change any aspect of this course outline. **********