EARTH SCIENCES 2265A: PALEOBIOLOGY AND PALEOECOLOGY

Course Description: A survey of common fossils from bacteria, protists, calcareous algae, to invertebrate animals. Topics on each group of fossils include functional morphology, evolution, ancient living environments, contribution to sediment accumulation and reef-building, utility for dating and correlating rocks and for understanding long-term biodiversity change.
Lectures: (Monday and Wednesday, 10:30–11:30AM, AHB-1B08)
Laboratories: Thursday, B&GS-1069, 2:30–5:30PM.

Learning Outcomes: Upon successful completion of this course, students will be able to:

- recognize the most common fossil groups in the geological record, predominantly megafossils that are visible in sedimentary strata of various geological periods based on laboratory assignments;
- describe the most common rock-forming, including reef-building fossil groups and their importance in ancient ecosystems;
- explain the functional morphology of fossil organisms and interpret their adaptations to living environments in the geological past;
- use paleoecological information to interpret depositional environments, such as marine vs. fresh-water conditions, water depth, turbulence level, oxygen content, and substrate types.

Prerequisite or Corequisite: ES 2200a/b or permission of department.
Antirequisite: Former ES 361a/b.

Instructor: Jisuo Jin, Professor (BGS Rm 0180; 519-661-4061; E-mail: jjin@uwo.ca)

Lectures: (Monday and Wednesday, 10:30–11:30AM, AHB-1B08)

Week 1: Introduction to the principles of paleontology, fossils and the geological time scale, paleoenvironments and paleobiogeography, processes of fossilization, and classification of organisms.
Week 2: Bacteria. Origin and evolution of primitive life forms and their relationships to the early lithosphere, hydrosphere, and atmosphere. Bacteria contribution to ecosystems and deposits.
Week 3: Protists. Calcareous and siliceous forms (such as coccoliths, foraminifers, diatoms, radiolarians) and their importance to the carbon dioxide and silica balance in the ecosystems.
Week 4–11: Major invertebrate fossil groups: zoological baupläne, functional morphology, evolution, and ecology/paleoecology.
Week 12–13: Paleontological applications: biostratigraphy, paleoenvironmental reconstruction, paleobiogeographic reconstruction, major trends of biotic radiation and mass extinctions.

Laboratories: Thursday, B&GS-1069, 2:30–5:30PM.

- Three-hour labs on these aspects of fossils: taphonomy, paleoecology, classification, functional morphology, and microscopic structures relevant to sedimentary petrology.

  Lab 1. Fossilization
  Lab 2. Bacteria and protists
  Lab 3. The reef-builders: sponges, corals, and byozoans
  Lab 4. The shelly benthos: brachiopods and molluscs
  Lab 5. Arthropoda (trilobites and "sea scorpions")
  Lab 6. The Deuterostomate invertebrates: echinoderms and hemichordates

- Students must complete all lab assignments in order to get a final grade for the course.
- For each lab, a part of the assignment is due by the end of the 3-hour session, and the remainder is due one week (7 days) after the lab session.
- A 10% deduction of marks will be assessed per one day of late submission.

Recommended Texts and Other Course Material

1) Clarkson, E.N.K. 1998. Invertebrate Palaeontology and Evolution (4th edition). Blackwell Science.

2) Jin, J. 2010. Earth Sciences 2265 Paleobiology and Paleoecology, Laboratory Manual. 110 pp. (Available in PDF electronic version on OWL)

3) Jin, J. Powerpoint lectures. (Available in PDF electronic version on OWL)

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Course Evaluation:	Mid-term exam (October 16, 10:30-11:20AM):	20%
	Final exam (University scheduled):	40%
	Classroom quizzes (random)	10%
	Lab assignments (see under Laboratories)	30%

Accommodation and Accessibility

If you are unable to meet a course requirement due to illness or other serious circumstances, you must seek approval for the absence as soon as possible. Approval can be granted either through a self-reporting of absence or via the Dean's Office/Academic Counselling unit of your Home Faculty. If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in NCB 280, and can be contacted at scibmsac@uwo.ca.

For further information, please consult the university's policy on academic consideration for student absences:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf.

If you miss the Final Exam, please contact your faculty's Academic Counselling Office as soon as you are able to do so. They will assess your eligibility to write the Special Exam (the name given by the university to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).

Academic Policies

The website for Registrarial Services is http://www.registrar.uwo.ca.

In accordance with policy, http://www.uwo.ca/its/identity/activatenonstudent.html, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

No electronic devices will be permitted on tests and exams.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Support Services

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Student Accessibility Services (SAS) at 661-2147 if you have any questions regarding accommodations.

The policy on Accommodation for Students with Disabilities can be found here: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_disabilities.pdf

The policy on Accommodation for Religious Holidays can be found here: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, http://westernusc.ca/services.