

**EARTH SCIENCES 4461 — ADVANCED PALEONTOLOGY
GEOLOGY 9532 — ANCIENT ECOSYSTEMS**

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

Aim of course: Advanced topics on applications of paleontological data to biostratigraphy, paleoecology, interpretations of major paleobiological and evolutionary events, ancient ecosystem changes, and paleogeographical reconstructions.

Prerequisites: ES 2265 and/or ES 2266.

University Policies:

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see: <http://www.uwo.ca/univsec/handbook/appeals/medical.pdf>

A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found here: https://studentservices.uwo.ca/secure/medical_document.pdf

Accessibility: *Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.*

Academic Offences: *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/handbook/appeals/scholoff.pdf>.*

Lectures (Tuesday and Thursday, 5:30–6:30PM, Room TBD).

- Week 1-3 **Taxonomic Basis for Paleobiology:** Concept of species; Conventional, cladistic and numeric taxonomy; Phylogenetic reconstructions.
- Week 4-7 **Paleoecology, Paleobiodiversity & Ancient Ecosystems:** Introduction to the concepts of functional morphology (autecology), fossil assemblages and communities, and paleoenvironmental reconstructions; Biospheric interactions with the atmosphere, lithosphere, and hydrosphere; patterns and trends of major biotic radiation, extinction, and recovery and their relationship to environmental changes.
- Week 8-9 **Biostratigraphy:** concepts and applications of biozones, biofacies, and geochronology.
- Week 10-11 **Paleobiogeography:** Faunal and floral provinces, realms, endemism, provincialism, cosmopolitanism, island biogeography, and paleogeographic reconstructions.

Week 12-13 **Presentations** of research topics by students.

Laboratory Research Project Tutorial (Thursday, 6:30-7:30PM)

Research project: A term paper in the format suitable for a scientific journal and an oral presentation. The approximate length of the term paper is 3000 words for undergraduate students and 5000 words for graduate students.

The following are *examples* of term paper topics, but other topics relevant to the course are also acceptable.

- Phyletic gradualism and punctuated equilibria, examples from the fossil record.
- Principles and methods of traditional vs. cladistic taxonomy.
- Functional morphology: interpreting fossilized organism-sediment relationships.
- Biotic (e.g. faunal, floral) adaptations to environmental change.
- Evolution of the reef ecosystem through time.
- Concepts and practices of biostratigraphy.
- Any one of the many mass extinctions and their interpreted causes.
- Application of fossil data to paleobiogeography and plate tectonics.

Marks Distribution

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| Final examination (refer to University schedule) | 40% |
| Classroom quizzes (random) | 10% |
| Research projects — Oral presentation (second last week of lectures) | 20% |
| Research projects — Term paper (due one week after presentation) | 30% |

Reference Texts

- 1) Clarkson, E.N.K. 1998. Invertebrate Palaeontology and Evolution (4th edition). Blackwell, 452 pp.
- 2) Prothero, D.R. 1998. Bringing fossils to life. McGraw-Hill, 457 pp.
- 3) Jin, J. Powerpoint lectures.

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