

# Earth Sciences 4462A Course Outline

**Title:** Glacial and Quaternary Geology

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**Aim of the Course:** Covers glacial behaviour and evidence for glaciation over the last 2 million years of Earth history. Glacial deposits and landforms, their uses and environmental implications. Glacial-interglacial cycles as revealed in deep sea cores, ice cores, and terrestrial materials. Global sea level, climatic changes and causes of glaciation. Quaternary history concentrating on the Great Lakes region.

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**Prerequisites:** one of ES 2260a/b or 3314a/b or Geography 214a/b, 316a/b, 317a/b, 318a/b, 319a/b, 321a/b or permission of the Department. Be sure to check prerequisites.

**Antirequisites:** the former Earth Sciences 462a/b, 463b

**Lectures:** M, W 1030-1130 in PA 117

**Labs:** W 230-530 in BGS 1053; readings suggested

**Instructor:** Bethany Dean, bdean8@uwo.ca; see instructor with official note if you miss a test or lab; no electronic devices allowed in tests; no texts, manuals or electronic devices required for course

**Marks:** labs 30%; midterm 20% (mid Oct); term paper 20% (early Dec); final exam 30%

Grads: labs 20%; midterm 20% (mid Oct); term paper 20% (early Dec); oral presentation 10%; final exam 30%

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## Topics:

Glaciology: glaciers - how they form, move, entrain, erode, transport, and deposit

Glacial theory: brief history and erosional evidence

Glacial systems, past and present: supraglacial, proglacial, subglacial processes, deposits, and landforms

Till: genesis, classification, properties, and uses

Drift prospecting: principles, methodology, case studies

Applied glacial geology: ground stability, drainage, waste disposal, aquifer contamination, placer and aggregate exploration

Global sea level and glacial isostatic changes

Deep-sea and ice cores and oxygen isotopes

Terrestrial evidence of glacial-interglacial cycles: caves, pluvial lakes, loess, paleosols, tephra markers

Quaternary history of North America

Causes of glaciations: orbital (Milankovitch) cycles, hemispheric synchronicity, greenhouse effect, atmosphere-hydrosphere-biosphere interactions

**Laboratory:** map, air photo, stratigraphic, applied and environmental exercises

Scholastic offenses are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offense, at the following Web site: [http://www.uwo.ca/univsec/handbook/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf)

Accommodation for missed work worth less than 10% of the total course grade due to illness will not require medical documentation; instead, contact the professor and refer to the Policy on Accommodation for Medical Illness at <https://studentservices.uwo.ca/secure/index.cfm>

Please contact the professor if you require material in an alternate format, or 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 x82147 about an accommodation.