

Earth Sciences 2260A Course Outline

1. Course Information

Course Information

Earth Sciences 2260A: Stratigraphy and Sedimentology: From Beds to Basins – Fall 2026

Laboratories: Monday 2:30 PM to 5:30 PM

Lectures: Tuesday and Thursday 11:30 AM to 12:30 PM

Office hours: email to schedule an appointment

Tutorial hours: TBD

List of Prerequisites

Earth Sciences 1022A/B or Earth Sciences 2200A/B or permission of the Department.

Unless students have either the prerequisites for this course or written special permission from the Department of Earth Sciences to enroll in it, they may be removed and withdrawn from this course in accordance with university policy. This may be done after the add/drop deadline of the academic term, and the course will be marked as withdrawn (WDN) on their academic record. This decision may not be appealed.

2. Instructor Information

Full name, title and appropriate contact information of the instructor and, if the course is taught by more than one instructor, the name of the person responsible for the course (course coordinator).

Instructors	Email	Office	Phone	Office Hours
Dr. Alina Shchepetkina	ashchep@uwo.ca		N/A	Email to schedule
TA: Tess Gates-Flaherty	tgatesfl@uwo.ca	TBD	N/A	TBD

Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

3. Course Syllabus, Schedule, Delivery Mode

This course offers an introduction to sedimentology, stratigraphy, and basin analysis. It covers the formation of sediments and sedimentary rocks across diverse environments on Earth, including continental, marginal-marine, and marine settings. We will look at the origins, composition, transport, deposition of sedimentary rocks, and various sedimentary environments because it is necessary to know what the building blocks look like before we start to build stratigraphic successions. We will also talk about ichnology – the exciting science of trace fossils that represent the activities of living organisms,

focusing on how they aid in interpreting past depositional environments. Stratigraphy helps interpret the order and timing of geological events in Earth's history, providing a framework for understanding sedimentary rocks within dynamic sedimentary environments. Finally, basin analysis will provide a broader perspective on the formation and filling of sedimentary basins, considering plate tectonic mechanisms and plate settings.

Learning Outcomes:

Upon successful completion of this course, you should be able to:

1. Identify the principal detrital and biogenic components of sedimentary rocks.
2. Identify the most common types of physical sedimentary structures and describe their origin in terms of fluid flow and environments of sedimentation.
3. Identify the main depositional environments, their constituent lithology, and typical sedimentary structures.
4. Relate the formation of the main types of sedimentary basins to causative plate tectonic mechanisms.
5. Apply the geological timescale as a basis from which to analyze the history of a sedimentary basin.

Classes begin: September 9, 2026

Fall Reading Week: October 10 – 18, 2026

Classes end: December 9, 2026

Exam period: December 11 – 22, 2026

Anticipated Lecture Topics:

Module 1 (Sept 9–Oct 29): Introduction to the course (Sept 10). Clastic rocks. Grain-size scale (Sept 15). Erosion and transport. Weathering. Common minerals in sedimentary rocks (Sept 17). Mudrocks (Sept 22). Textural properties of sediments (Sept 24). Carbonate rocks. Bacteria. Chemical and volcanogenic sediments. Carbonaceous sediments. Banded iron formations (Sept 29). Transport media. Properties of fluids. Grain size and flow velocity. Laminar and turbulent flows. Reynolds number (Oct 1). Flow regimes and bedforms. Dunes, bars, plane bedding (Oct 6). Wave-formed structures (Oct 8).

READING WEEK

Wind-formed structures (Oct 20). Gravity-driven sediment flows (mass flows) (Oct 22). Turbidity currents. Turbidites (Oct 27). Sedimentary structures in paleogeography (Oct 29).

Mid-term test (2 h; Nov 2) **LAB TIME**

Module 2 (Nov 3–Nov 19): Glacial depositional environments (Nov 3). Eolian depositional environments. Alluvial fans. Intro to rivers and paleosols (Nov 5). Lakes (Nov 10). Deltas (Nov 12). Intro to estuaries (Nov 17). Facies, facies associations, Walter's Law, and bioturbation (Nov 19).

Module 3 (Nov 24–Dec 8): Principles of Stratigraphy. Biostratigraphy (Nov 24). Sequence stratigraphy, biostratigraphy (Nov 26), magnetostratigraphy chronostratigraphy (Dec 1). Divergent continental margins: Rift and ocean basins. Convergent Margins: Foreland and Back-Arc basins. Strike-Slip basins, Epeiric platforms, and Intracratonic basins (Dec 3, 7 – **LAB TIME**, 8).

Final exam (3 h) **TBD**

4. Course Materials

Required textbook: Gary Nichols: *Sedimentology and Stratigraphy*. (2nd or 3^d Edition); also useful for 3314B. New and second-hand copies are available on Amazon (paperback copy from \$ 76.95) – commonly cheaper than the UWO bookstore.

Amazon: <https://www.amazon.ca/Sedimentology-Stratigraphy-Gary-Nichols/dp/1119417287>

Wiley: <https://www.wiley.com/en-ie/Sedimentology+and+Stratigraphy%2C+3rd+Edition-p-9781119417286>

Seems to be available for download from ACADEMIA website:

https://www.academia.edu/9552581/Sedimentology_and_Stratigraphy

All course material will be posted to OWL Brightspace: <https://westernu.brightspace.com/>

Students are responsible for checking the course OWL Brightspace site regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.

If students need assistance with the course OWL Brightspace site, they can seek support on the [OWL Brightspace Help](#) page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

5. Methods of Evaluation

Grading Scheme and Assessment Dates

The overall course grade will be calculated as listed below:

Lab assignments (7)	32%	Lab assignments based on activities conducted during and after lab time
Pop-up quizzes (6)	3%	Online quizzes throughout the course
Midterm Test (2 h)	20%	Covers all lecture material up to midterm
Group project	9%	Oral presentation on a recent paper in sedimentary geology in groups of two
Participation Q&A	1%	Active participation in Q&A after oral presentation by peers, up to 1%
Final Exam (3 h)	35%	Written (multiple choice, short and long answer). Covers the entire course.
Extra project		Optional essay on novel direction in sedimentary geology, up to 3%

Mid-term test, written during lab period, 2 h. Monday, November 2, 2:30–5:30 pm

Group project presentation during lab period, Monday, November 16, 2:30–5:30 pm

Final Exam: written, up to 3h. Questions cover the entire course. Date and classroom: TBA.

Lab Assignments

Seven lab assignments related to, and building on, the lecture material will be conducted during lab time. Please review the posted lab presentation and assignment before the scheduled lab. Unfinished labs can be completed at your own pace during the following week: the samples will be kept in boxes in BGS 1065, which should remain unlocked. The completed lab assignment will be due at the beginning of the next lab (i.e., the following Monday). Graded assignments will also be distributed at the beginning of the next lab. A schedule of the assignments is provided below.

Lab Assignment	Lab date	Due Date
Lab #1: Products of weathering and erosion (4%)	September 14	September 21
Lab #2: Clastic rocks (4%)	September 21	September 28
Lab #3: Carbonate rocks (4%)	September 28	October 5
Lab #4: Sedimentary structures and environments (4%)	October 5	October 19
Lab #5: Introduction to stratigraphy (4%)	October 19	October 26
Lab #6: West Alberta Correlation exercise	October 26	
Midterm exam	November 2	

Lab #6 cont: West Alberta Correlation exercise (6%)	November 9	November 16
Group presentations, Q&A	November 16	
Lab #7: Core logging exercise	November 23	
Lab #7 cont: Core logging exercise (6%)	November 30	December 7
Lecture time	December 7	

Group Project

You are expected to work together in small groups (~2 people) to critically analyze a recent paper in sedimentary geology. Topics will include: 1) Carbonates on Mars, 2) Mudstone: Gotta Love Them, 3) Weathering on Mars, 4) Weathering in Antarctica/Arctic, 5) Turbidites, 6) Eolian Deposits, 7) Fluvial Deposits, 8) Lacustrine deposits, 9) Estuaries and Trace Fossils, and 10) Deltas and Trace Fossils (papers must have been published between 2015 and 2026). If you have another topic in mind that is not mentioned here, please talk to your instructor in advance. You must note your paper selection on OWL by October 5. Groups of two will be assigned randomly by the instructor to simulate real-world working conditions, where you may not always have a choice of whom you work alongside.

This Group project will consist of an oral component, i.e., a 7-min presentation by both authors followed by a 2-3 min question period. Every student in the audience will be expected to ask at least 1-2 questions during the Q&A period. This assignment must be completed to receive credit in this class. If you are absolutely unable (documented absence) to attend the lab session dedicated to the oral presentations, you will have to schedule a time to present it in front of the instructor and the TA.

Extra Writing Assignment

If you wish to increase your grade by up to 3% (up to a max of 100% for the entire course), you can complete a Writing Assignment, analyzing the relevant scientific literature and outlining YOUR ideas on an *emergent/emerging topic* in sedimentary geology. The report should include at least 5 valid references, up to 4 figures; students are encouraged to procure and cite additional references. Due on or before December 7.

Students must write the essay in their own words, only responsible use of AI is permitted (i.e., for minor improvements of the sentence structure/ grammar). Whenever students take an idea, or a passage from another author, they must paraphrase it and use proper referencing (i.e., in-text citations). Plagiarism and irresponsible AI use is a major academic offence. The essay should consist of a Title, Author Information, Abstract (max 200 words), Keywords (up to 5), and Introduction, followed by the main body of the text (including figures), Conclusions, and References. The length of the text should not exceed 4 pages total (images, image captions, and references not included), using a 12 pt. font (Times Roman, Helvetica or Courier), single spacing, and “normal” margins. There should be up to 4 figures (with figure captions) illustrating the data and ideas. The figures should be properly explained in the text and cited (e.g., Fig. 6). All material must be properly referenced in the text (e.g., Zonneveld et al., 2012; Atkinson and Eastman, 2015) and the list of references in alphabetical order should be included in the following format (e.g., Wetzel, A., 2010. Deep-sea ichnology: observations in modern sediments to interpret fossil counterparts. *Acta Geologica Polonica*, v. 60, p. 125-138).

Abstract: Summarizes the main facts and interpretations presented in the essay. It should be comprehensible without reference to the main body of the document. No References should be cited in the Abstract. Less than 200 words.

Introduction: Set the background to the study/idea, identify what the main problem is, why this problem is important, and then outline how you will address this problem/idea in the essay.

Main Body: Think about the data and ideas presentation order. If methods need describing (for an essay this normally is not the case), this should come first. Present all of the data first, these are the observations and facts. Then present data interpretation, which should be consistent with the problem as identified in the Introduction.

Conclusions: This should summarize the interpretations from the main body of the paper. A minimal amount of data should be repeated here.

Information about Missed Coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs*, posted on the Academic Calendar: https://uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf,

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person. The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage: https://registrar.uwo.ca/academics/academic_considerations/. All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

Midterms and Tests

This course has one midterm test and a **cumulative** final exam (covers the whole course). There is no makeup test for a missed midterm. If a student misses a midterm, its weight will shift automatically to their final exam grade. They do not need to request Academic Consideration for a missed midterm; the reweighing will be done automatically.

The only exception is an early sitting, offered solely for a university-sanctioned schedule conflict (e.g., conflict of two midterms, Varsity competitions) or an official religious accommodation that prevents a student from writing the midterm at its scheduled time. If a student requires this accommodation, they must notify their instructor in writing no later than one week before the test. No other circumstance, including illness, qualifies for an early sitting or makeup; these are addressed through the automatic reweighting described above.

Labs and Quizzes

This course includes seven labs. If a student misses one lab, the missed lab will simply be excluded from the final course grade, and the score will be re-calculated based on other six labs. No make-up assessment will be provided, and students do not need to request Academic Consideration for one missed assessment. Students are therefore encouraged to plan accordingly, as additional missed labs will receive a grade of zero unless Academic Consideration is granted in accordance with Western University policy. The students are encouraged to submit all work, even if incomplete, since a partial mark is always better than a zero.

There are six online quizzes in this course, each worth 0.5% of the final grade. Each quiz will remain available for one week after it is posted and may be completed at any time during that period. Quizzes cannot be retaken once submitted.

Group presentation is an essential requirement of this course. If a student misses it with an official academic consideration, they will be offered a rescheduled date (see section **Group Project**). The student must request Academic Consideration through SAP to access this opportunity.

Special Examination

Per university policy, Academic Consideration requests with supporting documentation are required for the final examinations scheduled during official examination periods by the Registrar's Office.

If the student has been approved by the Academic Advising Office to write a Special Examination (SPC) and the final exam is their only outstanding course component, an SPC will be assigned to them and scheduled by the instructor per university policy.

If the student misses their SPC exam and is approved for Academic Consideration, they will be withdrawn from the course without academic penalty. If they experienced extenuating circumstances such as prolonged illness, they may appeal to the Associate Dean (Academic), on a case-by-case basis, for the opportunity to write the final exam the next time the course is offered. An outstanding SPC will reduce their course load for the term in which the exam is deferred, as outlined in the [Definitions of Types of Examinations](#) policy.

If the student misses their SPC exam and Academic Consideration is not approved, or was not requested, they will receive a grade of zero on the exam.

6. Additional Statements

6.1 Religious Accommodation

When a recognized religious holiday either requires a student to be absent from the University, or requires or prohibits an activity that makes it impossible for them to complete an academic requirement scheduled that day, they are entitled to accommodation. No student will be penalized for an absence for religious reasons, and an alternative means of satisfying the requirement will be arranged. This accommodation is provided in accordance with the University's policy on Accommodation for Religious Holidays:

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

The student should submit their requests through the Student Absence Portal (SAP), identifying the conflict and the specific course component(s) affected (e.g., test, midterm, exam).

Midterms and Tests: If a religious observance conflicts with a midterm test, they must submit their request no later than **one week** before the test. Their instructor will arrange an early sitting of the test. As set out above, no makeup test is offered for any other reason; this early sitting is available specifically for this accommodation.

Final Examinations: If a religious observance conflicts with the final exam, the student must submit their request no later than **two weeks** before the exam. Their instructor will arrange a Special Examination to take place no later than one month after the end of the examination period.

Students are responsible for finding out what was covered in any class they miss due to a religious observance, and for taking the appropriate steps to keep up with the course.

If a suitable arrangement cannot be reached between a student and their instructor, they should consult the Undergraduate Chair of the department offering the course, and if necessary, the Associate Dean (Academic) of the Faculty of Science.

For a list of recognized religious observances, please visit the calendars posted on the Equity, Diversity & Inclusion website - <https://www.edi.uwo.ca> (About Us – Resources – Additional Resources – Calendars).

6.2 Academic Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

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

6.3 General Academic Policies

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

Use of @uwo.ca email: In accordance with policy, https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf, the centrally administered e-mail account provided to students will be considered the individual's official university email address. It is the responsibility of the account holder to ensure that emails received from the University at their official university address are attended to in a timely manner.

Requests for Relief (formally known as “appeals”)

Policy on Request for Relief from Academic Decision:

https://uwo.ca/univsec/pdf/academic_policies/appeals/requests_for_relief_from_academic_decisions.pdf

Procedures on Request for Relief from Academic Decision (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_requests_for_relief_procedure.pdf

6.4 Scholastic Offences

Policy on Scholastic Offences:

https://uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_offences.pdf

Procedures on Scholastic Offences (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_scholastic_offence_procedure.pdf

Use of Electronic Devices During Assessments

In courses offered by the Faculty of Science, the **possession** of unauthorized electronic devices during any in-person assessment (such as tests, midterms, and final examinations) is strictly prohibited. This includes, but is not limited to: mobile phones, smart watches, smart glasses, hidden cameras and wireless earbuds.

Unless explicitly stated otherwise in advance by the instructor, the presence of any such device at a student's desk, on their person, or within reach during an assessment will be treated as a scholastic offence, **even if the device is not in use**.

Effective September 2026, the typical penalty for this offence is a failing grade in the course AND a 12-month prohibition on retaking the course.

Only devices expressly permitted by the instructor (e.g., non-programmable calculators) may be brought into the assessment room. It is their responsibility to review and comply with these expectations.

Use of Generative AI Tools

Unless otherwise stated, the use of generative AI tools (e.g., ChatGPT, Microsoft Copilot, Google Gemini, or similar platforms) is **not permitted** in the completion of any course assessments, including but not limited to: assignments, lab reports, presentations, tests, and final examinations.

Using such tools for content generation, code writing, problem solving, translation, or summarization—when not explicitly allowed—will be treated as a **scholastic offence**.

If the use of generative AI is permitted for a particular assessment, the conditions of use will be specified by the instructor in advance. If no such permission is granted, students must assume that use is prohibited. It is the student's responsibility to seek clarification before using any AI tools in academic work.

6.5 Support Services

Academic Advising. Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, requests for relief, exam conflicts, and many other academic-related matters: <https://www.uwo.ca/sci/advising/>.

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

Gender-Based and Sexual Violence. Western is committed to reducing incidents of gender-based and sexual violence (GBSV) and providing compassionate support to anyone who has gone through these traumatic events. If a student has experienced GBSV (either recently or in the past), they can find information about support services for survivors, including emergency contacts, at:

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Accessibility for Coursework. A student may contact the course instructor if they require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to them. If they have any questions regarding accommodations, they may also contact Accessible Education at http://academicsupport.uwo.ca/accessible_education/index.html

Learning Development and Success. Learning-skills counsellors at Learning Development and Success (<https://learning.uwo.ca>) are ready to help students improve their learning skills. The facility offers strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Student Councils.

Student-run support services are offered by the University Students' Council (<https://westernusc.ca>) and the Science Students' Council (<https://www.westernssc.ca>).