University of Victoria

Earth & Ocean Sciences 423 A01
UNIVERSITY OF VICTORIA
3-3-0 (1.5 UNITS)
SPRING TERM 2025

We acknowledge and respect the Lək̓ʷəŋən (Songhees and Esquimalt) Peoples on whose territory the university stands, and the Lək̓ʷəŋən and WSÁNEĆ Peoples whose historical relationships with the land continue to this day.

COURSE OUTLINE

EOS423: Advanced Sedimentology and Stratigraphy

Lectures: M/Th 1:00 to 2:20 PM in Clearihue A330
Labs: F 1:30 to 4:20 PM in Bob Wright Centre B119

PREREQUISITES: EOS201, 1 of EOS325 or EOS225
COREQUISITES: NONE

CONTACT INFO

Instructor(s):	Blake Dyer	
Email:	blakedyer@uvic.ca	
Office:	BWC A419	
Office Hours:	by appointment	
Lab Coordinator	Blake Dyer	blakedyer@uvic.ca
Teaching Assistant(s)	none	

COURSE DESCRIPTION

In this course, we will explore how geologic and Earth surface processes, including tectonic, sea level and climate changes, are recorded and preserved in the stratigraphic record. Focus will be on modern and ancient case studies, with topics including basin analysis, cyclostratigraphy, process sedimentology and paleo-environmental reconstruction. Problem sets emphasize computational skills, including introductory time-series analysis, geospatial analysis and remote sensing.

The course will meet twice a week (M/Th) for lectures and on Fridays to work on the weekly assignment. You are encouraged to work together on all aspects of the weekly assignments, although copying or directly sharing code is not allowed. Each person must submit their own work (written answers, figures, etc.) and code used for all calculations. On Monday some weeks we will begin with a flipped classroom: I will randomly select at least two students to informally present their progress on the current weekly assignment.

These presentations will serve as a jumping off point for the whole class to discuss and work through remaining challenges with help from the instructor. Any remaining time on Monday and all of Thursday will be used for lectures on new material, guided group discussions of assigned readings, or in class exams.

LEARNING OUTCOMES

Below is a list of some specific knowledge and skills you can expect to gain through this course. This term you will:

- use your own models to develop intuition about the internal and external controls on stratigraphic architecture
- develop an understanding of the processes that lead to correlative surfaces
- consider the predictable patterns of when and where time is missing in basin
- use your understanding of process to interpret modeled and real stratigraphic data and infer the past
- build age models for stratigraphic data while considering uncertainty
- use time series analysis to look for cycles and patterns in stratigraphic data
- develop your scientific writing skills focusing on clear and precise communication
- consider processes that lead to differences between siliciclastic filled basins and carbonate filled basins

COURSE MATERIALS

There is no required textbook. Readings will be made available through the course website. Students are required to have a computer available to work on assignments.

BRIGHTSPACE

You are expected to routinely check the Brightspace site. All announcements, materials, supplemental readings, and schedule changes will be posted to brightspace.

EVALUATION

This course will use the official UVic standard grading scale. Your final grade will be determined by your scores on in-class mid-term exams, lab write-ups, and a programming lab exam. There is no final exam.

Lecture		40%
Assignment presentations	10%	
Mid-term 1 (Feb 13, week 6)	15%	
Mid-term 2 (Apr 3, week 13)	15%	
Laboratory		60%
6 Lab write-ups	40%	
1 Lab exam (Mar 14, week 10)	20%	

Students must pass ($> 50\%$) both the lab and lecture portion of this course to pass the course. In other words, a 100% average on the labs and a 49% average on the in class exams will result in a failing final grade (and vice versa).

COURSE POLICIES

If you need academic accommodation to address barriers to your education, please register with the Centre for Accessible Learning (CAL) as soon as possible. We work with the CAL to create a learning environment that is equitable, inclusive, and usable for all.

POLICY: CLASS CONDUCT

Please follow the latest provincial and University guidelines with regard to COVID-19 protocols: UVic COVID-19 information and what to do if you are ill. No materials from the course may be redistributed without written permission from the instructors (e.g., no posting of materials to sharing websites). If we are required to meet on Zoom, you should remain muted during lecture unless you are speaking to the class or instructors.

POLICY: LATE/MISSED ASSIGNMENTS OR EXAMINATIONS

Students are required to complete all exams to recieve a final grade in the course. If you must miss the an exam for a valid reason (illness, accident, family emergency etc.), you must notify the instructor as soon as possible, and you may be asked to provide documentation to support your request. If you miss an exam **with a valid excuse**, we will arrange a make up exam.

If a student does not sit an exam, they will be assigned a grade of **N** regardless of their performance in other elements of the course. A grade of **N** is a failing grade and will be scored as a zero in the calculation of the students CGPA. The maximum percentage grade that can be assigned for a student achieving a **N** grade is 49%.

Assignment due dates are considered **hard deadlines**, except under extra-ordinary circumstances. If you have a known conflict that will make completing an assignment impossible, please notify the instructors well in advance of the due date.

POLICY: ATTENDANCE

You are expected to be present and active in the lectures. I will not formally track participation in lecture, but from past experience I know that the assignments will be significantly easier to complete and exam scores are higher for those who attend and participate in lecture and laboratory. If you will miss a lab for medical or other valid reasons, please contact the instructor as soon as possible. Recall that **you must pass the lab to pass the course**.

POLICY: ACADEMIC INTEGRITY

It is every student's responsibility to be aware of the university's policies on ccademic integrity, including policies on cheating, plagiarism, unauthorized use of an editor, multiple submission, and aiding others to cheat.

If you have any questions or doubts, you can ask your course instructor or the Centre for Academic Communication.

COURSE FEEDBACK

I value your feedback on this course. Towards the end of term, as in all other courses at UVic, you will have the opportunity to complete an anonymous survey regarding your learning experience (CES). **The survey is vital for providing feedback** to me regarding the course and my teaching, as well as to help the department improve the overall program for students in the future. The survey is accessed online and can be done on your laptop, tablet, or mobile device. I will remind you and provide you with more detailed information nearer the time but please be thinking about this important activity during the course.

COURSE WEEKLY CALENDAR

This calendar will get updated throughout the term (last updated on: January 2, 2025). Exam dates are set, but lecture and lab topics are subject to change.

Week	Date	Lecture Topic
1	M Jan 6	Lecture 1 ... Course Introduction
	Th Jan 9	Lecture 2 ... Simplifying Surface Transport
	F Jan 10	... *No lab*
2	M Jan 13	Lecture 3 ... Kenyon and Turcotte (1985)
	Th Jan 16	Lecture 4 ... Modeling Bulk Transport
	F Jan 17	Lab 1.1 ... Sedimentary Transport
3	M Jan 20	Flipped Classroom ... Lab 1.1
	W Jan 22	... *Last day to add course*
	Th Jan 23	Lecture 5 ... Modeling Bulk Transport
	F Jan 24	Lab 1.2 ... Sedimentary Transport (Numerical Model)
4	M Jan 27	Flipped Classroom ... Lab 1.2
	Th Jan 30	Lecture 6 ... Stratigraphic Sequences
	F Jan 31	Lab 1.3 ... Sedimentary Transport (Applying the Model)
5	M Feb 3	Lecture 7 ... Stratigraphic Sequences
	Th Feb 6	Lecture 8 ... Stratigraphic Time
	F Feb 7	Lab 1.3 ... Sedimentary Transport (Applying the Model)
6	M Feb 10	Flipped Classroom ... Lab 1.3
	Th Feb 13	Mid-term 1 ... *Stratigraphic Architecture*
	F Feb 14	Lab 2.1 ... Fourier Analysis
7	M Feb 17	... *Reading Break*
	Th Feb 20	... *Reading Break*
	F Feb 21	... *No lab*
8	M Feb 24	Flipped Classroom ... Lab 2.1
	Th Feb 27	Lecture 9 ... Stratigraphic Time
	F Feb 28	... *Last day to drop a course without penalty of failure*
	F Feb 28	Lab 2.2 ... Using Fourier Analysis to Interpret Modeled Basins
9	M Mar 3	Lecture 10 ... Stratigraphic Time
	Th Mar 6	Lecture 11 ... Cycles
	F Mar 7	Lab 2.2 ... Using Fourier Analysis to Interpret Modeled Basins
10	M Mar 10	Flipped Classroom ... Lab 2.2
	Th Mar 13	Lecture 12 ... Cycles
	F Mar 14	Lab Exam ... Numerical Modeling and Data Analysis
11	M Mar 17	Lecture 13 ... Hinnov and Goldhammer (1991)
	Th Mar 20	Lecture 14 ... Age Models
	F Mar 21	Lab 3.1 ... Modeling Carbonates and Their Ages
12	M Mar 24	Flipped Classroom ... Lab 3.1
	Th Mar 27	Lecture 15 ... Carbonates
	F Mar 28	Lab 3.1 ... Modeling Carbonates and Their Ages
13	M Mar 31	Lecture 16 ... Carbonates
	Th Apr 3	Mid-term 2 ... *Stratigraphic Time and Cyclicity*

APPENDIX

SCHOOL OF EARTH AND OCEAN SCIENCES INFO

- SEOS Website: uvic.ca/seos
- SEOS Office: seos@uvic.ca
- SEOS Director: Dr. Jay Cullen, seosdirector@uvic.ca
- SEOS Mental Health & Wellness Contact: Dr. Andy Fraass, andyfraass@uvic.ca
- SEOS Undergraduate Advisor: Dr. Jon Husson, seosadvisor@uvic.ca
- SEOS Graduate Advisor: Dr. Roberta Hamme, seosgradadvisor@uvic.ca
- Ocean Science Mentor: Dr. Jody Klymak, seosoceansci@uvic.ca
- Climate Science Advisor: Dr. Colin Goldblatt, climateadvising@uvic.ca

UNIVERSITY STATEMENTS & POLICIES

- Academic Calendar: Information for All Students
- Creating a respectful, inclusive, and productive learning environment
- Accommodation of Religious Observance
- Accommodation and Access for Students with Disabilities
- Student Conduct
- Non-academic Student Misconduct
- Accessibility
- Diversity / EDI
- Equity statement
- Sexualized Violence Prevention and Response
- Discrimination and Harassment Policy

UVIC GRADING SYSTEM

As per the Academic Calendar:

Grade	Grade point value	Grade scale	Description
A+ **A** **A-**	9 8 7	90-100% 85-89% 80-84%	**Exceptional**, **outstanding** and **excellent** performance. Normally achieved by a minority of students. These grades indicate a student who is self-initiating, exceeds expectation and has an insightful grasp of the subject matter.
B+ **B** **B-**	6 5 4	77-79% 73-76% 70-72%	**Very good**, **good** and **solid** performance. Normally achieved by the largest number of students. These grades indicate a good grasp of the subject matter or excellent grasp in one area balanced with satisfactory grasp in the other area.
C+ **C**	3 2	65-69% 60-64%	**Satisfactory**, or **minimally satisfactory**. These grades indicate a satisfactory performance and knowledge of the subject matter.
D	1	50-59%	**Marginal** Performance. A student receiving this grade demonstrated a superficial grasp of the subject matter.
F	0	0-49%	**Unsatisfactory** performance. Wrote final examination and completed course requirements; no supplemental.
N	0	0-49%	Did not write examination or complete course requirements by the end of term or session; no supplemental.

STUDENT RESOURCES

POSITIVITY AND SAFETY

The University of Victoria is committed to promoting, providing, and protecting a positive and safe learning and working environment for all its members.

Student Groups & Resources

ACADEMIC RESOURCES

UVic Library - *UVic Library offers many services and resources for undergraduate and graduate students.* uvic.ca/students/academics/library-services

Learning Resources - *UVic Learn Anywhere is the primary learning resource for students that offers many learning workshops and resources to help students with academics and learning strategies.* onlineacademiccommunity.uvic.ca/LearnAnywhere/learning-strategies

Centre for Academic Communication - *Offers online and in-person one-on-one tutorials, workshops, and more.* uvic.ca/learningandteaching/cac

Math & Stats Assistance Centre - *Offers drop-in, face-to-face tutoring and a friendly, collaborative study space for 100- and 200-level math and stats courses.* uvic.ca/science/math-statistics/current-students/undergraduate/msac

MENTAL HEALTH & WELLNESS

A note to remind you to take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep, and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone.

SEOS Mental Health & Wellness Contact - *Dr. Fraass is a faculty member who can act as a sympathetic ear and (more importantly) provide guidance about: how to access the multitude of University support services, and which are useful in different circumstances. Andy can be found by dropping by his office or lab (Bob Wright A431, B409). He is also available via email for questions or to arrange a time to have a chat.* andyfraass@uvic.ca

Student Wellness Centre - *Our team of practitioners offers a variety of services to support students' mental, physical, and spiritual health.* uvic.ca/student-wellness

Counselling Services - *Counselling Services can help you make the most of your university experience. They offer free professional, confidential, inclusive support to currently registered UVic students.* uvic.ca/services/counselling/

Health Services - *University Health Services (UHS) provides a full-service primary health clinic for students and coordinates healthy student and campus initiatives.* uvic.ca/services/health/

ACCESSIBILITY

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a documented disability or health consideration that may require accommodations, please feel free to approach me and/or the Centre for Accessible Learning (CAL) as soon as possible.

Centre for Accessible Learning - *The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.* uvic.ca/services/cal/

ADVISING

For academic advising-related questions, students in the School of Earth and Ocean Sciences are also encouraged to meet with the SEOS Undergraduate Advisor (seosadvisor@uvic.ca) as well as an academic advisor in the Academic Advising Centre early in their studies to help map out a plan to declare a major and complete university program requirements.

Academic Advising Centre - *Academic advice and support is currently available by phone, email and virtual or in-person appointments.* uvic.ca/services/advising

Ombudsperson - *The ombuds office is an independent, impartial, and confidential resource for undergraduate and graduate students and other members of the University of Victoria community. The ombudsperson helps resolve student problems or disputes fairly.* uvicombudsperson.ca

ACADEMIC CONCESSION

You can request an academic concession if your course requirements are affected by unexpected and unavoidable circumstances, or conflicting responsibilities. Concession requests can be for an in-course extension, deferral, withdrawal under extenuating circumstances, or an aegrotat. Please speak to an advisor at the Academic Advising Centre if you have questions on how requesting a concession will affect your academic program.

Undergraduate Academic Concessions - uvic.ca/students/academics/academic-concessions-accommodations

EQUITY AND HUMAN RIGHTS AT UVIC

EQHR is a resource for students, staff, and faculty who have experienced sexualized violence, discrimination, and/or harassment and are looking for informal and/or formal resolution options as well as advice, coaching, and/or education. We are available for confidential consultations so that you can ask questions and learn your options.

EQHR – *By email at eqhr01@uvic.ca or in-person (Sedgewick C115).* uvic.ca/equity

Sexualized Violence Resource Office – *If you have been directly or indirectly impacted by sexualized violence, reach out to the SVRO for information, advice, resolution options (restorative and disciplinary) as well as support options and referrals. The SVRO is both survivor-centred and trauma-informed in their approach. You can reach us by phone at 250-721-8021 or by email at eqhr01@uvic.ca to book either an in-person (Sedgewick C119) or online appointment.* uvic.ca/svp

RESOURCES FOR INTERNATIONAL STUDENTS

International Centre for Students - *The primary office supporting international students on campus at the university-wide level.* uvic.ca/international-experiences

UVic Global Community Initiative - *Provides various supportive programming, including a Mentorship Program and Conversation Partner Program.*
uvic.ca/international-experiences/get-involved/uvic-global-community

RESOURCES FOR INDIGENOUS STUDENTS

Indigenous Student Support - *UVic offers holistic services to Indigenous students throughout their academic journey.* *uvic.ca/students/info-for/indigenous-students*

Elders in Residence - *The Office of Indigenous Academic and Community Engagement (IACE) has the privilege of assembling a group of Elders from local communities to guide students, staff, faculty, and administration in Indigenous ways of knowing and being.* *uvic.ca/services/indigenous/students/programming/elders*