

EASC 2919 Introduction to Marine Geology/ OCSC 2200, Geological Oceanography - Winter 2023

A. CALENDAR DESCRIPTION

OCSC 2200/ Earth Sciences 2919: is a study of the formation and evolution of oceans, including plate tectonics, mid-ocean ridges (birth place of oceans), subduction zones (where oceans are consumed), sedimentary environments such as estuaries, deltas, beaches and barrier islands, continental shelves, slopes and deep abyssal plains and special topics, including anoxic events, evolution of tides, atmosphere-ocean interactions, formation of banded iron formations, snowball Earth, black and white smokers, and how Earth modulates its climate through atmosphere, hydrosphere, biosphere and lithosphere interactions.

PR: Earth Sciences 1000 with a grade of at least 55%

B. LEARNING GOALS

Upon successful completion of this course, the student will be able to show a moderate level of understanding of the following:

- the evolution of the water in the solar system and the origin and evolution of the oceans of the early Earth
- climate, ocean-atmosphere-lithosphere-biosphere interactions and various mechanisms in which they affect climate, including glaciations, and paleoceanography
- role that the evolving life played in the radical changes that occurred in ocean chemistry of the ocean: anoxia, euxinia and Banded Iron Formation
- change in the Earth-Moon distance and tides and their geological and biogeochemical implications
- geography of oceans and seas, reasons for bimodality of Earth's hypsography, and the three ocean provinces and their morphology
- the development of the Plate Tectonics theory, driving forces associated with plate movements and the tectonic processes associated with plate margins
- stable isotopes in marine microfossils and other paleoproxies for past climate and ocean studies
- ocean acidification and the preservation/dissolution of carbonates on the seafloor
- global sea level variations, their causes and their impacts on marine sedimentation, erosion and atoll formation
- show an understanding of the water masses and their motions in global oceans and their implications to geological oceanography
- physics of sedimentation
- show an understanding of the contemporary sedimentary environments, including the estuaries, beaches and barrier islands, deltas, continental shelves, slopes and abyssal plains

C. COURSE LECTURES AND CONTACTS

Lectures: Monday, Wednesday, Friday; 09:00–09:50 am; ER 3007C

Attendance (and being awake despite the early hour ...) at lectures is critical to your success in this course, particularly since there is no single textbook that covers all subjects covered there. Ahead of the lecture, I will post on Brightspace **lecture notes**, so during the lectures you can concentrate on understanding the material. Note however that the lecture notes may have **blank areas and questions** – which we will fill-in and answer during the lectures. This is another reason not to miss the lectures – not only will you have material explained, not only will you have **a chance to ask questions**, but also it will save you time in the long term when preparing to the exams. During lectures, I will often indicate which issues are particularly important (and therefore more likely to show up on the exams ...)

Instructor: Dr. Piotr Trela, **Office:** CSF- 2231 (the new science bldg.). tel. 864-3063

Office hours (to be confirmed): **Mon. Wed. Fri. 11.10-11.50 am**, or by appointment.

E-mail: primary: the internal email inside Brightspace ptrela@online.mun.ca; in case of problems there: backup email: ptrela@mun.ca. In the latter case, PLEASE include in the subject the name of the course. Every effort will be made to respond to emails within 24h, with the exceptions of evenings, weekends and holidays.

For Brightspace technical issues: contact the tech support in CITL

For deferrals of the final exam, or dropping the course after the last day to drop courses – please contact EASC Manager of Academic Programs, Michelle Miskell, ER 4063C, Phone: 709-864-4464, E-mail: mmiskell@mun.ca

D. COURSE RESOURCES

NO MANDATORY TEXTBOOK: Because of the breadth of topics covered, **there is no single textbook** that is adequate for this course (and worth the additional cost to you). The last good one was Kennett's "Marine Geology", but published long before you were born (1982!). If I get my hands on it - I will put it on the MUN's reserve. For things that have changed since 1982 – we will use materials from various textbook and review articles. In particular, we will also use some materials from **the online textbook:** "*The Sea Floor: An Introduction to Marine Geology*" by Eugen Seibold and Wolfgang Berger (you don't have to buy the access to it – you can access it, for free, by connecting to the MUN library). For background in general oceanography topics and for implications of oceans to sedimentation and coastal geology, I will put on **the library reserve** some of my oceanography textbooks.

BRIGHSPACE

I will use the Brightspace website in many ways:

Main Page: News and updates, Calendar

Content: Lecture notes posted before the corresponding lecture. Also: information on exams, resource documents, and relevant links

Communications: Brightspace **email** is *the preferred way to email* me (my general MUN email listed above should be used only as a backup). E-mail is best for discussing private or very specific questions; for general questions it is better to use the **Discussion**, as the answer to your question may be of interest to other students as well. You can post questions in the discussion area under your name or, if you prefer, anonymously.

Assessment: Grades section – for your midterm grades.

E. IMPORTANT DATES AND COURSE SCHEDULE

JAN. 6, FRI..	1 ST LECTURE
FEB. 6, MON.	MIDTERM 1
FEB. 20-26	WINTER BREAK, NO CLASSES
FEB. 27, MON.	MIDTERM 2
MAR. 2, THUR.	<i>LAST DAY TO DROP COURSES WITHOUT ACADEMIC PREJUDICE</i>
MAR. 22, WED	MIDTERM 3
APR. 6, THU	LECTURES END
APR. 12-21	FINAL EXAM SESSION

Detailed list of lectures will be posted separately

F. EVALUATION

Term Test 1	20%
Term Test 2	20%
Term Test 3	20%
Final examination	40%

Exam format:

may contain all or some of the following: multiple choice, fill in the blanks, short answers, and/or map/graph questions. The final exam will be cumulative, with proportionally more weight given to the part not covered on the mid-term.

G. COVID AND OTHER HEALTH ISSUES

• **General COVID-19 supports:** The Memorial COVID-19 website is an excellent source of information and support, with specific links for students, supports and services, and health and wellness.

• **If you feel unwell, stay at home.** Doctors' notes **are not required** for COVID-related absences. For other medical issues they needed only for absences longer than 5 days. Please contact me as soon as possible so we can figure out the alternatives. The only other times when doctor's note might be needed would be if you apply to drop the course after the last day to drop courses, or if you apply for a deferral of the final exam.

• **COVID contingencies:** if Memorial University operations change because of the COVID-19 situation, we may need to transit the course to a fully online delivery format. If this transition occurs, it will be **announced on Brightspace**, along with an update of the syllabus and revision of lecture schedule. Any

necessary revisions to the evaluation methods will be made in consultation with the students registered in this course. If a student demonstrates that they would be disadvantaged by the change, then, as per 6.7.4 of the University Calendar, accommodations will be made.

- Typically, a transition would involve the exams changing to Brightspace online exams (Quizzes), the term project is already done via Brightspace Online Rooms.

H. HOW TO DO WELL IN THIS COURSE

Use the available resources:

- **Lectures and lecture notes:** attending lectures will save you time and effort, as it takes more time and more work to go through the material on your own. Also, lectures will allow you to individualize your learning, since you will have a chance to ask for clarification of the points that are not clear to you and ask questions about issues that interest you. Without attending the lectures – you will have to answer these questions on your own.
- **Ask questions** after the class or during the office hours
- Use **other resources** – textbooks on the Library reserve or via Library online copy, as well as other texts identified in class

Pay attention to key concepts and/or those that span more than one unit – if you know how the plate tectonics work – then you should be able to predict all? most? of the features associated with plate tectonics – the Ring of Fire, different depth and magnitude of earthquakes, why the islands in Hawaii get older, lower and colder as we move along the chain, position of trenches, even where in the open ocean can you find pteropod shells in sediments and why only there, and many, many more.

Maps, figures and diagrams – in all natural sciences this is the primary way to present your results and explain concepts and relationships. Looking at a map or figure ask yourself – what it is about, what are the patterns, does it make sense in the context of what you have already learned, and if not – why?

Ask yourself: **“why?”** Yes, you have to learn some facts and names (which answers the question: “what?”), but it is the answer to the questions: “why?”, “does it make sense?”, and “so what?” that is the true measure of whether you understand the material and whether you will be able to apply this understanding in your future studies and work. And it is so much more intellectually satisfying.

See the connections – try to “connect the dots” – connect what you have learned in one context and apply this in a new context. This is often how science progresses – we take a technique or concept from one discipline and apply it in another one.

I. FEEDBACK

I value your feedback on the content or the format of the course – it lets me know what works and what does not and can make the course better for you and for future students. If you have any specific questions about the content – let me know during lecture, during office hours or via Brightspace: Communications -> Discussion section – either by posting there a question about the material, or by providing anonymous feedback in the Feedback subsection.

J. POLICIES

Grading system

The grading system follows that described in the Memorial University Undergraduate Calendar: <https://www.mun.ca/regoff/calendar/sectionNo=REGS-0661> 6.9 Letter Grades, Numeric Grades and Points Per Credit Hour.

Academic Integrity: Students are expected to adhere to those principles which constitute proper academic conduct. A student has the responsibility to know which actions, as described under Academic Offences in the University Regulations, could be construed as dishonest or improper. Students found guilty of an academic offence may be subject to a number of penalties commensurate with the offence including reprimand, reduction of grade, probation, suspension or expulsion from the University. For more information regarding this policy, students should refer to the University Regulations for Academic Misconduct (Section 6.12) in the University Calendar.

For guidance on proper scholarly behaviour the student should seek advice from their instructors and faculty advisors. <http://www.mun.ca/regoff/calendar/sectionNo=REGS-0748>). You may also check the Memorial University Library's Academic Integrity webpage, specifically, the "Fast facts about academic misconduct", which provides information on writing tests and exams, and using "homework help" sites: <https://www.library.mun.ca/researchtools/guides/integrity/>

Medical Notes:

When is a medical note may be required?

1. For absence at the final exam and requesting a deferred examination.
2. Requests to drop the course after the last day to do so.
3. If more than one evaluation was missed during the term due to an extended illness (see below).

When is a medical note NOT required?

When prevented from completing a part of the evaluation by situations **related to COVID-19 of less than 14 calendar days' duration**, including illness, isolation or quarantine requirements, or caregiving requirements. Non-COVID related illness of less than 5 calendar days (during the term).

L. INCLUSION AND EQUITY

Students with Disabilities

Memorial University of Newfoundland is committed to supporting inclusive education based on the principles of equity, accessibility and collaboration. Accommodations are provided within the scope of the University Policies for the Accommodations for Students with Disabilities (www.mun.ca/policy/site/policy.php?id=239). **Students who may need an academic accommodation** are asked to initiate the request with the [Glen Roy Blundon Centre](#). I encourage any class participant(s) who may require physical or academic accommodations to talk to me to see how your needs may be met.

Equity

We welcome all learners from various disciplines and differing ethnic and cultural backgrounds from within the University, as this provides opportunity for the sharing of a diversity of experiences, world-views, values, problem-solving approaches, and enlightening and enriching course perspectives. It is an expectation that course discourse be collegial and respectful across disciplinary, ethnic, cultural, and personal boundaries.

Memorial Support Services

Support Services offered to students at Memorial include:

- The Counselling Center <http://www.mun.ca/counselling/home/>
- The Glen Roy Blunden Center <http://www.mun.ca/blundon/about/index.php>
- The Writing Center <http://www.mun.ca/writingcentre/about/>
- Student Affairs and Services <http://www.mun.ca/student/home/>
- The International Student Advising Office <http://www.mun.ca/isa/main/>

For Additional Supports see: www.mun.ca/currentstudents/student/ and <http://munsu.ca/studentlife/centres/>, among them:

Memorial University Libraries, The Commons (QEII library), CITL Support Centre, Information Technology Services, Academic Advising, and specific departmental help centres, as well as: Student Wellness and Counselling Centre, Student Support and Crisis Management, MUN Chaplaincy, Sexual Harassment Office, Student Parent Resource Centre, Aboriginal Resource Centre, Disability Information Support Centre, International Students Resource Centre, Sexuality and Gender Advocacy, Student Parent Assistance & Resource Centre, Students Older Than Average, Intersections – A Resource Centre for Marginalized Genders, and specific departmental societies.