

ERTH 3806: STRUCTURAL GEOLOGY – WINTER 2022

Welcome to Structural Geology, the course that explores the structures of the Earth's lithosphere as well as the causes and mechanisms of their formation. My email is SharonCarr@CUNET.carleton.ca - don't hesitate to email anytime with your questions. I will be available to meet with you after classes or labs, during scheduled office hours, and by appointment.

This document and the Brightspace course website contain information about the course, instructor contact information and academic policies. It also contains links to a range of student-focused organizations & student support (e.g. Earth Sciences groups and activities, Health Care Resources, Ojigkwanong Indigenous Student Centre, Paul Menton Centre, Science Student Success Centre, etc.). I encourage you to take advantage of these resources.

The teaching assistants and I want to see you succeed in this course and will do whatever we can to keep you engaged and help you learn!

COURSE DESCRIPTION:

ERTH 3806 Structural Geology [0.5 credit]: Structures and deformational processes in a variety of crustal settings. Applications to geological engineering and mineral and petroleum exploration. Prerequisites: EARTH 2105 and EARTH 2406. Lecture two hours a week and laboratory three hours a week.

COURSE DELIVERY:

It was planned that classes and labs would be on-campus for the winter term; however, in December the decision was taken to move the first three weeks of classes online with the hope that we will be back in the classroom after Jan 29th. Here are explanations of the two modes of course delivery.

A. SYNCHRONOUS ONLINE COURSE DELIVERY DURING REGULARLY SCHEDULED LECTURE AND LAB TIMES ON WEDNESDAYS BETWEEN JANUARY 12th & JAN 26th (OR UNTIL IN-CLASS LEARNING HAS BEEN FORMALLY SCHEDULED BY THE UNIVERSITY)

You will need access to a computer with mic and video camera, capability of printing figures, access to power point as well as other office programs, ability to scan or photograph hand-made drawings and a pdf file maker. Please let Sharon know ASAP if you don't have these capabilities or have difficulty with internet connection.

Lecture: 9:35 - 11:25 AM (Wednesday) synchronous course delivery via zoom: Lectures, including in-class exercises and discussions, will be held by zoom video conference. We will make use of breakout rooms for group work and discussions. The zoom link for the lecture will be posted on Brightspace; the same link will be used every week. ***Lectures will be recorded and posted on Brightspace.***

Laboratory A01: 2:35 - 5:25 PM (Wednesday) synchronous course delivery via zoom.

Laboratories will be conducted by zoom videoconference with use of break out rooms to promote student interaction. The zoom link for the lab will be posted on Brightspace; the same link will be used every week. ***The laboratory introduction will be recorded and posted.***

Zoom Etiquette & Protocols:

- ✓ Ask questions anytime (i.e. type in the chat, raise your hand, or just speak up even if it means potentially interrupting)
- ✓ Mute your mic unless you intend to speak (to prevent distracting background noise). Manage 'supress background noise' in Advanced Zoom Audio menu.
- ✓ During lectures, use your video as you see fit
- ✓ During labs, activate your video (if possible)
- ✓ During in-class exercises, break-out rooms, and discussions, activate your video (if possible)
- ✓ ***For technical difficulties during class or lab time***, contact Instructors immediately, in the moment, via chat, text or email for trouble shooting or information about using an alternate platform.
- ✓ ***If the Instructors have technical difficulties***, check email and Brightspace page for instructions. If it is not possible for the class to resume, then replacement material will be posted in due course.

B. ON-CAMPUS CLASSES AND LABS (START DATE, FEB 02 AT THE EARLIEST, TBA)

Lecture: 9:35 - 11:25 AM (Wednesday) Tory Building TB 210: Lectures, including in-class exercises and discussions, will be held "in person" in the Tory Building Room 210 classroom, with full adherence to covid safety protocols. ***Lecture slides will be available on Brightspace; however, lecture participation will not be available via videoconference, nor will lectures be recorded or posted.***

Laboratory A01: 2:35 - 5:25 PM (Wednesday): Laboratories will be conducted "in person" in the laboratories within the Department of Earth Sciences with full adherence to covid safety protocols (e.g. two simultaneous labs with low occupancy in each lab). ***Lab introductions will not be posted.***

Teaching Assistants (weekly office hours, with zoom links, will be posted on Brightspace; appointments at other times are available upon request; emails will be answered):

Rafael Bacha (RafaelBacha@cmail.carleton.ca)

Sarah Mount (SarahMount@cmail.carleton.ca)

Thereza Yogi (TherezaYogi@cmail.carleton.ca)

MARK DISTRIBUTION:

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| Bonus Syllabus quiz (due Jan 23 rd) | 1% |
| Course participation - reading assignment quizzes (of 11 reading assignment quizzes, 9/11 count towards the final grade) | 40% |
| In-class polls & in-class assignments | not graded |
| Class & Lab Midterm Quiz (Feb 16 th in lab period) | 10% |
| Class and Lab Final Quiz (Apr 6 th in lab period) | 10% |
| Laboratory assignments (of 10 labs, 9/10 count towards the final grade) | 40% |

Note that completion of all components of the course is required to pass the course (i.e. the reading assignment quizzes, laboratories, midterm quiz, and final quiz components). A total percentage of $\geq 50\%$ for the course is required to pass the course.

Assignments & Their Deadlines: Check the Brightspace course page and Class Schedule (3806-22_Schedule.pdf) for deadlines and on-line quiz instructions. Weekly **Reading Assignments** (i.e. online quizzes available on Brightspace course page) will be due at 11: pm Sunday evenings. Weekly **Laboratory Assignments** will be due at 11:00 pm on Tuesday evenings (files are to be submitted to the Brightspace Laboratory upload site).

Late Assignment and Lab Policy. Late assignments and labs will be accepted without penalty in the instance of illness, emergencies, and in some cases, technical difficulties, etc. **but you are required to contact S. Carr prior to the assignment deadline or within 24 hours after the deadline** (e.g., via email) to make arrangements. Otherwise, for late labs, 10% per day will be deducted for each day late. Assignments and labs will not be accepted more than 6 days after the normal due date.

Conflicts with Course Requirements:

If you have a conflict with course requirements, **bring this to the attention of S. Carr beforehand.**

Missed Course Requirements Due to Illness:

If a lab, assignment or exam is missed due to illness, contact S. Carr, no later than 24 hours after the deadline regarding a deferral. In the case of a serious illness, see the rules concerning deferral of an exam or assignment at <https://carleton.ca/registrar/specialrequests/deferral/>.

COURSE REQUIREMENTS – MY STUDENT RESPONSIBILITIES ARE:

- **Act with academic integrity**, which is a commitment, even in the face of adversity, to the values of honesty, trust, fairness, respect and responsibility.
- **Be equipped:** i.e., computer with camera and mic, textbook & lab manual, hand lens, scale, compass, protractor, calculator, graph and tracing paper, stereonet, fine point pencils with hard 2H pencil leads, pencil sharpener, eraser, colored pencils.
- **Email sharoncarr@ccunet.carleton.ca or send a message right away or within 24 hrs** to advise of absences due to illness, emergencies or other difficulties.
- **Regularly check the Brightspace webpage, course outline and my Carleton emails for a synopsis of the weekly rollout including:**
 - structural themes of the week
 - office hours
 - reading assignments, laboratories and their deadlines
 - required resources and tools to have at hand for each class or lab
- **Students with accommodations via the Paul Menton Centre (PMC). Notify S. Carr well in advance of PMC accommodations (e.g. two weeks before an exam).**
- **Participate in the weekly lectures:** come to class with the resources required for the in-class exercise; engage with in-class activities and the posted resources.
- **Participate in the weekly laboratories:** come to the labs with the required resources; engage with the instructors and classmates
- **Complete and submit laboratory and reading assignment quizzes on time.**

ERTH 3806 COURSE LEARNING OUTCOMES:

By the end of this course, I will be able to:

1. Identify and describe the physical and geometric characteristics of structures and systems of structures.
2. Carry out structural analysis and interpretation (i.e. surface and subsurface mapping; cross-section construction; orthographic projection; stereographic projection; strain analysis; kinematic analysis; determination of fault relationships with respect to principal stresses; and structural analysis of joints, faults, lineations & foliations, folds, and shear zones).
3. Relate forces and stresses to mechanical strength and behaviour of rocks.
4. Explain deformation mechanisms of structures and microstructures.
5. Interpret the origin and structural (or tectonic) significance of structural systems.
6. Apply structural analysis to Geoscience problems involving Earth systems, resources or hazards.
7. Distinguish observations from interpretation, apply critical thinking skills and communicate questions, ideas, data, interpretations, and conclusions pertinent to the field of structural geology.

REQUIRED TEXTBOOK AND LABORATORY MANUAL (on reserve in the library):

Hatcher, Robert D, Jr. & Bailey, Christopher, M. 2019. Structural Geology, 3rd edition, Oxford University Press. ***This is a required textbook with reading assignments worth a substantial part of your grade.*** Purchase book or e-book; books will be available at the Carleton bookstore or online.

Rowland, S.M., Duebendorfer, E.M. and Gates, A. 2021. Structural Analysis and Synthesis, A Laboratory Course in Structural Geology. Published by Wiley Blackwell. ***Fourth Edition (Do not acquire the 2007 3rd edition)***. This book is required; readings and problems form the basis for labs throughout the term. Purchase from the bookstore, or on-line. (Note: If you purchased the 3rd edition last year, please contact me via email to discuss).

REQUIRED TOOLS:

Textbook and lab manual. Computer with camera & mic, internet and ability to make pdf files. Geometry set (i.e., with scales in metric and English, protractor, drawing compass); drafting and mapping tools (e.g., fine point pencils with hard 2H pencil leads, pencil sharpener, eraser, colored pencils); stereonet, graph paper, tracing paper, mineral and rock identification and classification resources, etc.

STUDENT RESOURCES:

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| Carleton GeoSoc (Dept Undergrad Student Geology Society) | https://discord.gg/pAreZszd |
| Health & Wellness Resources on Science Student Success Centre (SSSC) webpage | https://sssc.carleton.ca/resources/succeeding |
| Ojigkwanong Indigenous Student Centre | https://carleton.ca/indigenous/cii/students/ojigkwanong-indigenous-student-centre/ |
| Ottawa-Carleton University SEG student chapter (Society of Economic Geology) | https://www.facebook.com/groups/1512324829077735 |
| Paul Menton Centre PMC) | https://carleton.ca/pmc/ |
| Science Student Success Centre (SSSC) | https://sssc.carleton.ca/ |

2022 WINTER TERM DATES

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| Jan 5 | University reopens |
| Jan 10 | Winter term classes begin |
| Jan 24 | Last day for registration in winter term classes; last day to change courses |
| Jan 31 | Last day for withdrawal with full fee adjustment |
| Feb 21 | Statutory holiday – University closed |
| Feb 22 -25 | Winter break – no classes or labs |
| Mar 16 | Last day to submit accommodation requests to PMC |
| Apr 12 | Winter term ends |
| April 14-28 | Final exam period Statutory holiday – University closed |
| April 15 | Statutory holiday – University closed |

POLICIES, ACADEMIC INTEGRITY AND PLAGERISM

SANCTIONS ARE SEVERE AND ARE STRICTLY ENFORCED. The instructor is required to report all incidents (or suspected incidents) directly to the Dean of Science.

- **First offence, first-year students** (< 4.0 credits completed): No credit for assessment(s) in question, or a final grade reduction of one full letter grade (e.g., A- becomes B-), whichever is a greater reduction
- **First offence (anyone else): A grade of F in the course**
- **Second offence (anyone): A grade of F in the course and a one-term suspension from studies**
- **Third offence: Expulsion from the University**

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| Academic Accommodations and Human Rights Concerns | https://students.carleton.ca/course-outline/ |
| Academic Integrity and Accommodations policies | https://carleton.ca/senate/senate-policies/ |
| Academic Integrity (Science) | https://science.carleton.ca/academic-integrity/ |

Academic misconduct

The University has adopted a policy to deal with allegations of academic misconduct. Please review and familiarize yourselves with Carleton's Student Academic Integrity Policy:

<https://carleton.ca/senate/senate-policies/> as well as that of the Faculty of Science: <https://science.carleton.ca/academic-integrity/>. These policies are binding on all students.

Recording policies of video conference activities:

This class or portions of this class and laboratory introductions may be recorded by the instructor or TAs for educational purposes. These recordings will be shared only with students enrolled in the course via the course Brightspace page.

Unauthorized student recording is prohibited. Students requesting the use of assistive technology as an accommodation should direct such requests to the [Paul Menton Centre](#).

Unauthorized student recording of classroom or other academic activities (including advising sessions or office hours) is prohibited. Unauthorized recording is unethical and may also be a violation of University policy. Students requesting the use of assistive technology as an accommodation should contact the [Paul Menton Centre](#). Unauthorized use of classroom recordings – including distributing or posting them – is also prohibited. Under the University's [Copyright Policy](#), faculty own the copyright to instructional materials – including those resources created specifically for the purposes of instruction, such as lectures slides, lecture notes, and presentations. Students cannot copy, reproduce, display, or distribute these materials or otherwise circulate these materials without the instructor's written permission. Students who engage in unauthorized recording, unauthorized use of a recording, or unauthorized distribution of instructional materials will be referred to the appropriate University office for follow-up.

Copyright of course materials

Classroom teaching and learning activities, including lectures, discussions, presentations, etc., by both instructors and students, are copy protected and remain the intellectual property of their respective author(s). All course materials, including PowerPoint presentations, outlines, and other materials are protected by copyright and remain the intellectual property of their respective author(s).

Students registered in the course may take notes and make copies of course materials for their own educational use only. Students are not permitted to reproduce or distribute lecture notes and course materials publicly for commercial or non-commercial purposes without express written consent from the copyright holder.

The Academic Integrity Policy:

- describes those actions and behaviors which violate Carleton University's standards of academic integrity;
- defines the responsibilities of various offices and individuals in upholding the policy;
- specifies the procedures and processes to be followed when an allegation of violating these standards has been made against a student;
- specifies the sanctions that may be applied to a student who has been found to have violated these standards; and,
- describes the appeal and petition processes open to students who feel they have not been treated fairly under this policy.

All work handed in must be your own work. Plagiarism (i.e., presenting another's ideas, arguments, words or images as your own), violation of exam rules, misrepresentation of facts for any academic purpose, using unauthorized material, impersonation, fabricating or misrepresenting research data, disruption of academic activities, obstruction or interference of scholarly activities of another student, unauthorized co-operation or collaboration, or completing work for another student are viewed as being particularly serious, and the sanctions imposed are accordingly severe. Students who infringe the Policy may be subject to one of

several penalties including: suspension from a program; withdrawal from courses; a grade of zero, a failure or a reduced grade for a piece of academic work; completion of a remediation process, etc. In particular:

- ✓ My answers to questions, exercises and assignments will be my own work.
- ✓ I will NOT share questions, answers or assignments with anyone else or post them anywhere on the internet, discussion boards, etc.
- ✓ I will NOT share course content (videos, lecture slides, or any other material) with anyone else or post them anywhere on the internet.
- ✓ I am aware of sanctions that may be used if I engage in any activity that will dishonestly improve my results in this course.

ACADEMIC ACCOMMODATIONS

<https://students.carleton.ca/course-outline>

Requests for Academic Accommodation: You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

Pregnancy obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Religious obligation

As soon as you receive your course syllabus, identify any potential conflicts between your religious obligations and course requirements. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Academic Accommodations for Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608. <https://carleton.ca/pmc/> or email pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your **Letter of Accommodation** at the beginning of the term. **Contact me (Sharon Carr) at least two weeks before any exams or assignments during the term to ensure that accommodation arrangements are made, and for final exams notify me and submit requests to PMC by March 19th.**

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: carleton.ca/sexual-violence-support

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>