

ES 1023b / ES 2123b
Planet Earth: Shaken and Stirred / The Dynamic Earth
Winter 2017

Location:

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| Lectures: | Monday & Wednesday 12:30–13:30 | AHB IR40 |
| 1023b Labs: | Section 002 Monday 13:30–15:30 Section 003 Monday 15:30–17:30 | B&GS-1053 B&GS-1053 |
| 2123b Labs: | Section 002 Tuesday 18:00-20:00 Section 003 Wednesday 14:30-16:30 | B&GS-1053 B&GS-1053 |
| Instructor: | Dr. Sheri Molnar | |
| Office: | B&GS (Biological and Geological Sciences) Room 1040 | |
| Email: | smolnar8@uwo.ca | |
| Phone: | 519-661-2111 ex 87031 | |
| Office Hours: | email me for an appointment. | |
| TAs: | TBA | |

Course Calendar Description for ES 1023a/b:

An overview of the origin and development of Earth and Solar System; constitution and active processes of Earth interior; how these processes have shaped Earth evolution in the past and how they continue to control surface phenomena such as earthquake and volcanic activity. Labs will introduce the main resource exploration techniques.

- *Prerequisites:* None
- *Antirequisites:* ES 2123a/b and the former Earth Sciences 085a/b.

Course Calendar Description for ES 2123a/b:

An introduction to the Earth as a large heat engine; topics will focus on large-scale dynamic processes that occur in the deep interior (mantle and core convection) and their relation to activity and phenomena on the face of the Earth (tectonic plate motions, plate interactions, earth magnetic field, etc.).

- *Prerequisites:* None
- *Antirequisites:* ES 1023a/b and the former Earth Sciences 085a/b.

Course Description:

This course explores the origin and development of Earth, its place in the Universe, its internal structure and the dynamics of its solid and liquid parts. The goal of this course is to enhance students' understanding of *how* our planet was formed, *how* it works, and *why* this is important to know. This course will focus on the following topics:

- Building blocks of planets, stars and galaxies.
- Origin and history of the Earth.
- The structure of the Earth – from core to crust.
- Exploring Earth's interior – seismology, gravity and geomagnetism.
- Dynamic processes that modify the Earth's surface – plate tectonics, volcanism, and earthquakes.

Geophysical field techniques form a major part of the laboratory work, which involves a two-hour laboratory session weekly.

Course Objectives:

Upon completion of this course successful students will be able to:

- Define terms and concepts that pertain to Earth's dynamic processes.
- Demonstrate concepts and theories through lab exercises.
- Evaluate and discuss concepts, theories, and models related to course material.

Course Materials:

Textbook: There is currently no textbook for this course. Material will be presented during lectures in the form of electronic presentations and handouts, and posted on OWL. Complete lecture notes will be absolutely necessary for success in this course!

Lab Manual: Will be provided on-line via OWL.

For additional (optional) reading, the following reference books are available in the Taylor (Science) Library:

- *The Dynamic Earth: An introduction to physical geology*, B. J. Skinner and S. C. Porter.
- *Earth Science*, E.J. Tarbuck and F.K. Lutgens.
- *The Earth's Dynamic Systems: A textbook in physical geology*, W. K. Hamblin.
- *Physical Geology*, C. C. Plummer and D. McGeary.

Course Evaluation:

| | 1023b | 2123b |
|--|-------|-------|
| Midterm test (in-class - probably February 24, 2016) | 30% | 30% |
| Final exam (April 2017; scheduled by registrar's office) | 40% | 30% |
| Essay (2123b students only)* | N/A | 10% |
| Laboratory reports | 30% | 30% |

Full laboratory attendance is mandatory. Documentation for missed labs will be required and rescheduling into other sessions for the same week will be available. Any missed lab for which a student has an acceptable reason may be replaced by an extra lab to be posted on-line via OWL at the end of the term. This make-up lab will be due in the last week of classes.

Note regarding Lecture Material: PDF presentations for each lecture will be posted the morning of the lecture (at the latest), and will remain on the website for the rest of the term. Note, however, that some material in the presentations will be deliberately left out, requiring you to fill in important terms and other information critical to the topic. You will therefore be required to come to the lectures. It follows that the PDF presentations posted on OWL are not to be used as a substitute for coming to class (you have been warned!) It is up to you to download the presentations when they are available (if you intend to annotate them in class). If you miss a class, it is entirely your responsibility to obtain the information you missed from a classmate.

Note regarding Laboratory Reports and Essay:

Laboratory reports are due one week after the specific session. It is expected that your answers will be sufficiently unique from others that it is obvious you didn't simply copy from a classmate.

*Essay: As part of the course requirements for students enrolled in ES 2123b, each student will submit an original essay of her/his own effort on any topic within the context of the course that highlights the Earth as a dynamic planet. The grade assigned for the essay will contribute to 10% of the final grade for the course. It will be combined in the final exam grade for a total of

(i.e., exam + essay =) 40%. Further details on the essay will be available on OWL later in the term.

Course Policies:

It is Faculty of Science policy that a student who chooses to write a test or exam deems themselves fit enough to do so, and the student must accept the mark obtained. Claims of medical, physical, or emotional distress after the fact will not be considered. Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: <http://www.uwo.ca/univsec/handbook/appeals/scholoff.pdf>

Late Policy: Labs and the essay are due on the date specified on the assignment. 10% will be deducted for every day late.

Missed Course Components:

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or supporting documentation to the Academic Counselling Office of your home faculty as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed.

- If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in WSC 140, and can be contacted at 519-661-3040 or scibmsac@uwo.ca. Their website is http://www.uwo.ca/sci/undergrad/academic_counselling/index.html.
- A student requiring academic accommodation due to illness must use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found here: https://studentservices.uwo.ca/secure/medical_document.pdf
- For further information, please consult the university's medical illness policy at http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

If you miss the Midterm Test or the Final Exam, please contact your faculty's Academic Counselling Office as soon as you are able to do so. They will assess your eligibility to write a Make-up Midterm Test (if offered; if not offered, then re-weighting may be applied) or a Special Exam (the name given by the university to a makeup Final Exam). You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).

For UWO Policy on Accommodation for Medical Illness and a downloadable SMC see: <https://studentservices.uwo.ca/secure/index.cfm>

Students who are in emotional/mental distress should refer to Mental Health@Western <http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.

Classroom behavior:

Disruptive behavior will not be tolerated in class or on the course website. Please respect the rights of your classmates to benefit from the lecture by limiting your conversations to those essential to the class. Students who persist in loud, rude or otherwise disruptive behavior will be asked to leave. Cellular phones and text-messaging devices are NOT to be used in class and must be placed in silent mode. Laptops for the purpose of typing lecture notes are permitted in class, but please be respectful to your fellow students and turn the sound off. Audio and/or

videotaping of lectures is not permitted unless approval has been sought from the instructor in advance. All devices must be stored away during the in-class midterm test.

Academic Misconduct:

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Support Services:

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on 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.

- Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.
- Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

Accessibility:

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 ext. 82147 if you have questions regarding accommodation.

Science Student Council Support:

This course is supported by the Science Student Donation Fund. If you are a BSc or BMSc student registered in the Faculty of Science or Schulich School of Medicine and Dentistry, you pay the Science Student Donation Fee. This fee contributes to the Science Student Donation Fund, which is administered by the Science Students' Council (SSC). One or more grants from the Fund have allowed for the purchase of equipment integral to teaching this course. You may opt out of the Fee by the end of September of each academic year by completing paperwork in the Faculty of Science's Academic Counselling Office. For further information on the process of awarding grants from the Fund or how these grants have benefitted undergraduate education in this course, consult the chair of the department or email the Science Students' Council at ssc@uwo.ca.