

JEG100H1S – Introduction to Physical Geography and Earth Science

2019/2020: Winter Term

University of Toronto

Departments of Earth Sciences and Geography

Instructor

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Course description

This introduction to Physical Geography and Earth Science examines the atmosphere, lithosphere, hydrosphere, cryosphere and biosphere, and the intricate interconnections between these Earth systems. We emphasize processes, and flows of energy and materials, and consider all topics within the context of the ongoing climate crisis. Specific topics include weather and climate change, Earth materials, geological and geomorphic processes involved in the genesis of landforms, the water cycle, soils, glaciers and biomes. This course consists of two one-hour lectures per week, and six two-hour laboratory (=PRA) sessions. This is a science course, and covers breadth area “Physical and Mathematical Universe” (#5). No specific pre-requisites are required. The course is designed to be accessible to any UofT student interested in the subject matter and willing to engage in some quantitative analyses and hands-on learning.

Learning outcomes

Upon completion of this course, students will gain competencies in the following areas:

- Understanding of Earth systems and recognition of the linkages between them
- Analysis of impacts of climate change on Earth systems and our planetary support systems
- Quantitative and spatial reasoning through analysis of data, graphs, maps and images
- Data handling (basic manipulation, plotting and analysis)
- Communication: analysis and presentation of scientific information
- Learn something about our surroundings
- By the end of the course, students will have gained a new appreciation for the diversity of processes taking place in the environment, and new skills in problem solving in global change science

Required reading (2 books)

1. This textbook is required for JEG100:

Christopherson RW, Birkeland G, Byrne ML, Giles P. 2019/2016. *Geosystems*, 4th Canadian Edition. Upper Saddle River, New Jersey, USA: Pearson.

* Electronic or print formats are available. Please purchase your access card from UofT Bookstore.

* Previous editions of this textbook are also acceptable; copies will be placed on reserve at the Earth Sciences Library.

2. Also required: A free, online textbook:

Earle, S. 2019. **Physical Geology, 2nd edition. Victoria, BC. BC Open Textbook Collection.**
Available at: <https://opentextbc.ca/physicalgeology2ed/>

Note that additional readings may be assigned to supplement the textbook or to prepare for labs.

A note about the purpose of the reading: The textbooks provide essential background and numerous examples to illustrate and explain the concepts we cover in class. You will not be tested on every single aspect of what is in the reading. Rather, the textbooks are a resource for you to understand what was presented in class. Use the lecture material as a guide to what is most important to understand in the textbook. Reading all of the required chapters is needed to help you to understand the material presented in lecture, and to answer effectively conceptual questions on the midterm and final exams. The textbook readings are required and I recommend you read the listed chapter once before lecture, think about it and make a list of questions. After lecture, re-read the chapter, and bring any outstanding questions to class next time or to my office hours.

Course Webpage

We will use Quercus to distribute course notes and information. Students are responsible for checking Quercus regularly for course updates, and for checking your UofT email where occasional announcements may be sent.

Lectures

Tuesdays and Thursdays, 1-2 PM, NL6 (C. David Naylor Building, 6 Queen's Park Crescent)

Your attendance at lecture is expected. Based on my observations after teaching this course for >10 years, your performance in the course will be greatly enhanced if you attend class. Lecture slides will be posted on Quercus, but they do not contain all of the information covered in class. You are responsible for all material missed while you are absent from class.

Labs (= Practical or PRA sessions)

Lab Objectives. Six lab exercises have been designed to allow you to apply your knowledge from lecture and textbook reading. The labs are an opportunity to gain hands-on experience with analysis of Earth systems data, maps and Earth materials. *Prior to your lab, check Quercus for instructions on how to prepare for the lab.*

There are six lab sessions this term (see the schedule on the last page). Labs do not meet every week. **The first labs will take place the week of 14 January 2020 (there are no labs Jan 7-9).** **Attendance at labs is required, and you must attend your assigned lab section.**

Use ACORN to sign up for lab sections and to determine the room location for your section. Updates and TA contact information will be posted on Quercus during the first week of class.

Lab due dates are specified on the course outline. Labs 1 and 2 are due one week following your lab session (submit electronically via Quercus). Labs 3, 4, 5 and 6 are in-class assignments, and are due in hard copy at the end of your lab session. You must be in class to complete your lab.

Please note that labs 1 and 2 will be accepted up to 6 days late, but at a penalty of 5% per day. No extensions will be granted unless a valid UofT medical certificate is presented to document any illness (<http://www.illnessverification.utoronto.ca/>).

Evaluation

Labs	36% (There are 6 labs, each worth 6%; see schedule for due dates)
Midterm test	20% (27 February, 2020 – during class time). The midterm test includes material covered up to and including class on 25 Feb, and material covered in Labs 1-3. The test will consist of multiple choice, short answer questions and short application problems. A make-up midterm will only be considered for students who have valid documentation for medical illness, and who provide this within 5 days of the scheduled midterm test. Other students who miss the test will receive 0%.
Final exam	44% (during Faculty of Arts and Science exam period in April). The final exam covers the entire course and material on the labs. The format will be similar to that of the midterm test and to that of past exams for JEG100. Search “JEG100” in the old exam repository: https://exams-library-utoronto-ca.myaccess.library.utoronto.ca/

Other Information

Student Resources. UofT is a big place but has a wealth of outstanding resources available to support student learning, wellness and your student experience. Please visit:

<http://www.studentlife.utoronto.ca/>

This is your gateway and portal to the many services available to you including help with academic skill development, health and wellness, peer mentoring and networking, career planning, UofT for international students, work-life balance and recreational facilities on campus. If you need help, don't hesitate to ask for it. There is lots of help and support out there.

Accessibility. The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible. To better understand the scope of services offered, visit <http://www.studentlife.utoronto.ca/as>

Academic Integrity. Plagiarism is a very serious academic offense at the University of Toronto and academic offences will be dealt with accordingly. Academic integrity is at the core of our mission here at UofT. Our safeguarding of this fundamental value ensures that your UofT degree will be highly valued and respected. Every student must read the University's Code of Behaviour on Academic Matters (www.governingcouncil.utoronto.ca/policies/behaveac.htm). Examples of things which violate our code include, but are not limited to:

On labs and assignments:

- Using ideas or words from other people or other sources without proper credit and acknowledgement
- Submitting the same piece of work in more than one course without permission
- Obtaining unauthorized help on assignments. Please note that in JEG100, you may work in groups for some of the lab exercises, but each student must **independently** write up their own

lab report. It is a serious academic offense to submit work under your own name that has been written by someone else.

On tests and exams:

- Using cell phones or other unauthorized aids
- Looking at another students' answers
- Permitting another student to look at your answers

Please remember the seriousness with which the University of Toronto treats academic dishonesty of any form. If you have any questions about what constitutes plagiarism or cheating, or how to uphold our core values of academic integrity, please speak to your instructor. Additional resources are available to you at the UofT's [Academic Success Centre](http://www.studentlife.utoronto.ca/asc) (<http://www.studentlife.utoronto.ca/asc>) and the [UofT Writing Website](http://writing.utoronto.ca/) (<http://writing.utoronto.ca/>) where you will find, for example, [a useful handout by Margaret Proctor titled "How not to plagiarize"](http://advice.writing.utoronto.ca/using-sources/how-not-to-plagiarize/) (<http://advice.writing.utoronto.ca/using-sources/how-not-to-plagiarize/>).

Classroom etiquette. Lecture and lab sessions are valuable learning times. You will do best in this course if you concentrate on the subject matter during those times. Please respect your peers and do not use devices for texting, social media, etc., in class. If you choose to use a laptop for note taking, please do so in a manner which will not distract your peers. Using your laptop for activities not related to the class constitutes such a distraction.

Email policy. Student questions are best answered during instructors' office hours, or before/after/during lab and lecture. Email may be used for logistical or yes/no questions. You will obtain more satisfactory answers to your longer questions about course material and exams in person. **This includes your TA.** If you need to ask questions over email, we will make an effort to answer them *within 24-48 hours*. In order for us to do this, you must follow these instructions.

- Place JEG100 in the subject header.
- Send email using your UTORmail email account (see www.utorid.utoronto.ca)
- Consider email as a **formal and public** method of communication. Do not write anything that you do not want on the permanent, public record.
- Be professional when composing an email. Use proper grammar, spelling and full sentences. Please use an appropriate greeting (for example: "Dear Professor") and an appropriate sign-off (for example: "Thanks" or "Sincerely", followed by your full name)
- Do not expect an answer if you send an email at the last minute. We will try our very best to reply *within 24-48 hours*.

JEG100 is a Green Course! If you must print out lecture slides, print them using the multiple slides per page format.

Check out the UofT Sustainability Office's many initiatives:

<http://www.fs.utoronto.ca/SustainabilityOffice/>



	WEEK #	DATE	TOPIC	Reading: Chapters in Christopherson (C) or Earle (E)	LAB
ATMOSPHERE	1	07-Jan	Introduction to Earth systems	C1: Essentials of Geography E1: Intro to geology	NO LAB
		09-Jan	Solar radiation and the seasons	C2: Solar energy	
	2	14-Jan	Earth's energy (im)balance	C4: Atmosphere	Lab 1: Surface Energy Balance Read Christopherson, Chap 4
		16-Jan	Temperature	C5: Temperature	
3	21-Jan	Air pressure and circulation	C6: Circulations	NO LAB; Lab 1 due – hand in electronically via Quercus	
	23-Jan	Water in the atmosphere	C7: Water		
4	28-Jan	Weather	C8: Weather	Lab 2: Weather data and maps (Lab 1 returned this week electronically) Read Christopherson, Chap 8	
	30-Jan	Earth materials Q1 ANON. COURSE EVALS	C12: Dynamic Planet, pg 355-362		
LITHOSPHERE	5	04-Feb	Minerals	E2: Minerals	NO LAB; Lab 2 due – hand in electronically via Quercus
		06-Feb	Igneous Rocks	E3: Intrusive Igneous Rocks	
	6	11-Feb	Sedimentary Rocks	E6: Sedimentary Rocks	Lab 3: Minerals (complete in class) Read Earle, Chap 2 (Lab 2 returned this week electronically)
		13-Feb	Plate tectonics 1	E10: Plate tectonics C12: Dynamic Planet, pp 363-369	
Feb 17-21: Reading week. No class; no lab					
7	25-Feb	Plate tectonics 2/ Metamorphic Rocks	E7: Metamorphism	NO LAB	
	27-Feb	MIDTERM TEST DURING CLASS TIME: all material up to Feb 25 covered			
HYDROSPHERE/CRYOSPHERE	8	03-Mar	The hydrologic cycle	C9: Water resources	Lab 4: Cascadia Subduction Zone (in-class discussion); Lab 3 returned in class See lab handout on Quercus for required readings and podcast in preparation for Lab 4
		05-Mar	Groundwater	E14: Groundwater E20.3: Fossil fuels	
	9	10-Mar	Physical weathering	C14: Weathering, pp 428-440	NO LAB
		12-Mar	Chemical weathering	E5: Weathering	
10	17-Mar	Glacial landforms and permafrost	C17: Glacial landscapes	Lab 5: Landforms (due in class); Lab 4 returned in class Read Christopherson Chap 16 and Appendix A on topographic maps	
	19-Mar	Reconstructing paleoclimates	C11: Climate change		
BIOSPHERE	11	24-Mar	Soil formation COMPLETE OFFICIAL COURSE EVALS	C18: Soils E5: Weathering/soils	NO LAB
		26-Mar	Soil classification	C18: Soils	
	12	31-Mar	Climate and the carbon cycle	C19: Ecosystems, pp 611-612 E5.6: Weathering & climate change	Lab 6: Rocks (outdoor lab, due in class) Review Earle, Chaps 3, 6 and 7
2-Apr		The Anthropocene, the Critical Zone and Earth's future. Summary and review	Review all chapters covered		