

## GGR201H1S – Geomorphology

Department of Geography  
University of Toronto

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**LECTURES:** Tuesdays, 6–8 pm; ESB142  
**LABORATORIES** T8, W10, W2, W5 (ES1062); see detailed schedule

**Course Structure:** A one term course with lectures and eight laboratory sessions, including four (4) short assignments. A field trip will be scheduled for March, including a field trip report. An alternative assignment may be offered for students unable to attend the field trip.

**Required Text:** *Key Concepts in Geomorphology* 2013. W.H. Freeman & Co (MacMillan), 500 p. by  
**Paul R. Bierman and David R. Montgomery**

**Objectives:**

- (a) To introduce the basics of earth surface processes and landforms;
- (b) To introduce techniques used in the interpretation and analysis of earth surface features;
- (c) To introduce major concepts regarding landscape development and human impacts on the physical landscape.

Geomorphology is an "interface" science involving the lithosphere, atmosphere, hydrosphere and biosphere. It is an integral part of both physical geography and physical geology, and it embraces a study of the internal and external forces that shape the configuration of the earth's surface. The internal forces are related to tectonism and volcanism, whereas the external forces are related to the action of weathering, soil formation, mass wasting, river flow, ice movement, and to the action of wind, waves and subsurface water. Human activity is an important component of landform development. The prime goal of geomorphology is an understanding of landforms created by the interaction of these forces and human modifications. Geomorphology has many applications in physical and environmental sciences.

**Course Website on Blackboard:** <http://portal.utoronto.ca>

**Recommended Preparation:** GGR100H

## PROGRAMME:

- (1) Lectures:** A detailed outline will be available online before the first class with the lecture schedule.
- (2) Laboratories:** There will be four laboratory exercises during the term (8 sessions detailed in the schedule below). Students are to sign an attendance sheet in each lab session. Collaborative effort in working out assignments is encouraged although individual reports must be submitted.
- (3) Field Trip:** Assuming that weather permits, there will be a full-day field trip during the term to investigate selected geomorphological sites. The trip will take place on a Saturday (or a Sunday). A fee of \$20 dollars will be required to cover transportation costs.
- (4) Examinations:** There will be a two-hour (2 hr) mid-term test given during the lecture period and a three-hour (3 hr) final exam held at the end of term.

<b>Evaluation:</b>	Laboratory Exercises (4 x 7.5%)	30%
	Midterm Test	20%
	Field Trip Report	10%
	Final Exam	<u>40%</u>
		100%

### Course Lecture Schedule (Winter 2018)

January 9	– Introduction to geomorphology and geoscience
January 16	– Forces and earth structure
January 23	– Weathering and karst landscapes
January 30	– Hillslope form and processes
February 6	– Fluvial processes
February 13	– <b>Midterm test</b>
February 27	– Fluvial landforms
March 6	– Fluvial drainage basins; coastal geomorphology
March 13	– Aeolian geomorphology; climate and ice ages
March 20	– Glacial geomorphology
March 27	– Geomorphology scientific philosophy and geoscience applications
April 3	– Geomorphology research applications, guest lecturer
April 9-30	– <b>University final examination period</b>

### Assignment Schedule (2018) – (Start dates in brackets for T8 and W lab sessions)

Lab 1A – Maps and Google Earth (Jan 16,17)	Lab 3A – Fluvial I (Feb 27, 28)
Lab 1B – Google Earth, MSEXcel (Jan 23,24)	Lab 3B – Fluvial II (March 6, 7)
Lab 2A – Hillslopes I (Jan 30, 31)	Lab 4A – Aeolian (March 13-14)
Lab 2B – Hillslopes II (Feb 6, 7)	Lab 4B – Glacial (March 20-21)
	Field Trip Report (March 24)

**PROFESSIONAL GEOSCIENCE:** GGR201S – Geomorphology is an accepted course contributing to registration with the Association of Geoscientists of Ontario (**APGO**) under Additional Foundation Geoscience (Group 2B) minimum knowledge requirements.

For more information about Professional Geoscience accreditation, students are encouraged to visit [www.apgo.net](http://www.apgo.net) and to sign-up for free as a student member.

## GGR-201S: COURSE POLICIES

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**Submitting assignments, late assignments, and missed examinations:** It is generally expected that assignments will be completed within two weeks after distribution. Assignments are to be submitted to the assignment drop box in the Earth Sciences department (Room 1066) on **Tuesdays by 5 pm** OR submitted in person to the instructor at the beginning of lecture (**Tuesdays 6 pm in ESB142**). Submitted assignments must include the student name, course number GGR201 with the lab time, and the TA's name.

**Late assignments** will be penalized **5% per day**, including weekends and holidays, and will not be accepted after assignments have been returned. Late assignments may be submitted to the assignment drop box in the Earth Sciences department (Room 1066). All assignments must be submitted in hard copies; electronic or emailed assignments will not be accepted.

The Earth Science department (drop box) is located in the Earth Sciences Centre Room 1066 (see Blackboard location guide), and is open during regular university business hours weekdays 9am-5pm.

**Extensions** without penalty are only granted in cases of illness or family emergency. If accommodation is required for late submission of assignments or a missed midterm examination, students will be required to do the following:

- Inform the instructor by email within 24 hours of the due date (before or after); and
- Submit a UofT Medical Certificate to the Instructor or Department of Geography within 5 days of the missed assignment or mid-term exam.

Failure to comply with this policy can result in a grade of zero for the assignment or midterm in question. Deferred final exams and family emergencies are dealt with by the Registrar's office of your college or faculty.

**Returning marked assignments and course drop deadline:** The instructor and TA's will make every effort to return marked Lab Assignments within two weeks after the submission date or students will be notified by email of the expected return date using the Blackboard class list. Please note that **March 14<sup>th</sup>, 2018** is the deadline to drop S courses. It is expected that the grades for Lab Assignments 1 and 2 (for 15% of final grade) and for the midterm exam (for 20% of final grade) will be available on or before Friday March 9<sup>th</sup>, 2018.

**Communication and email:** Students are encouraged to ask questions in class and office hours. All emails must be from a UofT account, and include GGR201 in the subject heading with your full name signed in text. Emails will normally be returned within 48 hrs. Questions that require extensive responses are to be asked during office hours or in class, not via email.

**Blackboard and email address:** Course information, assignments, and links to supplemental readings will be posted on the Blackboard system (<http://portal.utoronto.ca>). You **MUST** use a @mail.utoronto.ca or @utoronto.ca email address with Blackboard (**Please confirm yours is on ROSI!**).

**Enrollment in the course:** ROSI is the only indicator of course enrollment. Granted access to the course website on Blackboard is not an indication of course enrollment. The instructor has no means of manually adding students to the course. Students not enrolled are encouraged to put their names on the ROSI waiting list and to attend the lecture and lab sessions at the beginning of the semester. It is expected that some students may drop the course after the first week, so motivated students are encouraged to frequently check their enrolment status on ROSI in the first couple of weeks of class.

**Switching Lab Sessions:** It is expected that students will consult with the instructor and TA's prior to attending any lab session for which they are not registered on ROSI. Each Lab Session has a cap of 20 students, which is reflected in the available lab resources and an expected TA to student ratio. At the discretion of the TA's, students may on rare occasion 'sit-in' on an alternate lab session—please ask for the TA's permission prior to the start of the lab time (and preferably by email at least 24 hours in advance). Students wishing to request a permanent switch of lab sessions must email the instructor; however, there is no guarantee that all requests will be accommodated. A final list of student names in each lab session will be compiled before January 31<sup>st</sup> to help TA's keep track of attendance and lab marking.

**Academic integrity:** Academic dishonesty, including plagiarism, will not be accepted. It is recommended that you consult the 'How not to plagiarize' website at:

<http://www.artsci.utoronto.ca/newstudents/transition/academic/plagiarism>

Please review the "Rules and Regulations" section of the Arts and Science Calendar for further information: [http://www.artsandscience.utoronto.ca/ofr/calendar/Rules\\_&\\_Regulations.html](http://www.artsandscience.utoronto.ca/ofr/calendar/Rules_&_Regulations.html)

For Lab Assignments in GGR201S, students are encouraged to work in groups; however, each student is responsible for submitting their own original work assignment. Copies of identical graphs and tables submitted by multiple group members will not be accepted. Obvious paraphrasing between group members on written answers will also not be accepted. Further information regarding expectations for referencing and standard documentation formats will be provided in the "Lab Guide to GGR201S" to be distributed in class. Additional resources for writing can be found at:

<http://www.writing.utoronto.ca/writing-centres/arts-and-science>.

**Accessibility:** The University of Toronto is committed to accessibility. Students requiring accommodation are encouraged to discuss their needs with the instructor within the first two weeks of class, and should register with Accessibility Services (<http://www.accessibility.utoronto.ca>).

**Accommodations for religious observances:** Please alert the instructor at least 2 weeks in advance if assignment due dates or examinations conflict with religious holidays, so alternate arrangements can be made. For further policy information from the university see:

<http://www.viceprovoststudents.utoronto.ca/publicationsandpolicies/guidelines/religiousobservances.htm>

**Class conduct:** Respectful behaviour towards the instructor and your classmates is mandatory during class and in all correspondences dealing with the course. This includes arriving in class on time, not talking during lectures, and limiting cell phone use (please set to silent). Use of laptop computers for note taking is acceptable. To avoid distracting other students, please limit internet browsing, email, and other social media during class time.

**Copyright in Instructional Settings:** No photography, sound-recording, or video-recording will be permitted during lecture, laboratory sessions, or field trip presentations without permission. If a student wishes to reproduce lecture presentations, course notes, or other similar materials provided by the instructor and TA's, he or she must obtain the instructor's written consent beforehand. Otherwise, all such reproduction is an infringement of copyright and is absolutely prohibited. In the case of private use by students with accessibility needs, the instructor's consent will not be unreasonably withheld.

<b>GGR 2015</b>	<b><u>Detailed Class Schedule, Topics, and Reading List</u></b>	<b>2016-17</b>
January 9 No Lab Readings:	Introduction to geomorphology  <b>Textbook:</b> Chapter 1 (pages 4–6 and pages 20–30) Figures <b>1.8, 1.10, 1.11, 1.12</b>	
January 16  <b>Lab 1A Jan 16-17</b> Readings:	Driving and resisting forces of geomorphology, Earth structure and materials: diastrophism, tectonics, and volcanism  <b>Topographic Maps</b>  <b>Textbook:</b> Chapter 1 (pages 6–14), Chapters 11 and 12 (355–359 and 389–392) Figures <b>1.1, 1.2, 1.3, 1.4, 11.1, 11.2, 11.3, 12.6</b> <b>Web:</b> NRC Website, see Lab 1 handout regarding topographic maps	
January 23  <b>Lab 1B Jan 23-24</b> Readings:	Surface weathering and geochemical processes Karst landscapes  <b>GoogleEarth</b>  <b>Textbook:</b> Chapter 3 (pages 76–89) and Chapter 4 (pages 133–136) Figures 3.1, 3.2, <b>3.3, 3.4, 3.5, 3.8, 3.10, 4.14</b>	
January 30  <b>Lab 2A Jan 30-31</b> Readings:	★ <u>Lab 1 due</u> ★ Hillslope form and processes Mass wasting, colluvial landforms, and hillslope evolution  <b>Earth materials &amp; hillslopes, Part I</b> <b>Note:</b> Data for Lab 2A to be submitted by email <u>due Friday Feb 2<sup>nd</sup></u>  <b>Textbook:</b> Chapter 5 (pages 145–163) Figures 5.1, <b>5.2, 5.3, 5.4, 5.5, 5.6, 5.7</b>	
February 6  <b>Lab 2B, Feb 6-7</b> Readings:	Fluvial processes, including hydrologic processes of overland flow Channel hydraulics, sediment transport, and hydraulic geometry  <b>Earth materials &amp; hillslopes, Part II</b>  <b>Textbook:</b> Chapters 4, 5 (pages 111–114, 126–127, 170-172) and Chapter 6 (all) Figures 4.2, 4.3, <b>4.9, 4.10, 4.13, 5.12, 6.1, 6.3, 6.5, 6.6, 6.7</b>	
February 13 No Lab Readings:	★ <b>Midterm test</b> ★  ★ <u>Lab 2 due</u> ★  Review	
February 19-23	Reading Week	

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February 27            Fluvial landforms and channel morphology  
Alluvial stratigraphy and bedforms.

**Lab 3A, Feb 27-28    Fluvial I lab**

Readings:            **Textbook:** Chapter 6 (all)  
Figures **6.2, 6.4, 6.8, 6.9, 6.10**, 6.11, 6.12

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March 6                Fluvial drainage basins; coastal geomorphology

**Lab 3B Mar 6-7        Fluvial II lab**

Readings:            **Textbook:** Chapter 7 (all) and Chapter 8 (pages 253–275)  
Figures 7.1, **7.2**, 7.3, 7.4, **7.5**, 7.7, 7.8, **7.9**, 7.10  
Figures **8.1**, 8.2, 8.3, 8.4, **8.5, 8.6**, 8.7, **8.8**, 8.9, **8.10, 8.11**

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March 13              ★Lab 3 due ★ Aeolian geomorphology  
Glacial cycles and climate, ice ages and glaciation of Canada

**Lab 4A Mar 13-14    Aeolian lab**

Reading:              **Textbook:** Chapter 10 (pages 329–350) and Chapter 13 (all)  
Figures 10.1, 10.2 (and 1.5), **10.3, 10.4**, 10.5, 10.6, 10.9,10.10, **10.11**, 10.12  
Figures **13.2**, 13.3, **13.4, 13.5, 13.6, 13.9, 13.10, 13.12**

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March 20              Glacial processes: mass balance, ice temperature, ice movement  
Glacial erosion, deposition, and landforms

**Lab 4B Mar 20-21    Glacial lab (in ES2119 or SS620, TBA)**

Readings:            **Textbook:** Chapter 9 (pages 291–316)  
Figure 9.1, **9.2**, 9.3, **9.4, 9.5**, 9.7, **9.8, 9.9, 9.10**

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**Field-Trip: Saturday March 24 (or Sun March 25, details given in class)**

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March 27              ★Lab 4 due ★ Geomorphology and scientific philosophy: complexity and scale  
Applied geomorphology, environmental geoscience, and natural hazards

No Lab                Work on Field Trip Reports

Readings:            **Textbook:** Chapter 2 (all), review general topics in Chapter 14.  
Figures 2.1, **2.4, 2.5, 2.6**, 2.7, 2.8, 2.9, 2.10, 2.11

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April 3                Geomorphology research applications ★ final exam question on this ★  
Guest lecturer

No Lab                ☆ **Field Trip Reports due Tuesday April 3<sup>th</sup>** ☆

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