Overview
The processes operating on and near the Earth’s surface are responsible for the development of landforms, and the evolution of these landforms through time. What makes geomorphology different from the other earth science fields is that it is primarily rooted in the explanation of present landforms, though these surfaces may be ancient. In addition, it is focused on understanding active processes, processes that can be (at least theoretically) observed as they occur. From the perspective developed by studying the present, geomorphologists may seek to interpret the importance of past events on present landforms and make predictions about what may occur in the future. By the end of this course I hope that you will be able to drive across southern Ontario with a new appreciation for the power and forces behind the shape of the landscape. We can see what southern Ontario (and the rest of the planet) are like today, what were they like 10 000, 100 000, 1 000 000 years ago? What will the landscape be like in the future?

Purpose
This course builds on major concepts from GEOG*1300 and is designed to complement GEOG*2110. Although GEOG*1350 is an acceptable pre-requisite for this class, you may find that much of the material that may be review for others is actually new material for you. The assigned (and required) textbook for this class should help you to stay on track, but you may want to consult an introduction to Physical Geography textbook in some instances, I can make recommendations if you come speak to me. In addition, this course provides a foundation for advanced courses in geomorphology at the 3000 and 4000 levels. A number of basic concepts in geomorphology will be introduced and the course will focus on examination of both landforms and geomorphic processes. While much of the material covered will be descriptive, rather than mathematical, the concept of geomorphology as an applied science will be stressed. Students will be introduced to primary sources (journal articles: reports) through class discussion and a short review paper. Laboratories are designed to teach basic skills in field and laboratory techniques.

Calendar Description
This is an introduction to geomorphology emphasizing weathering, slope and fluvial processes within drainage basins, and glacial and periglacial processes. Field and laboratory techniques will be applied.

Prerequisites:
1 of ENGG*1100, ENVS*1050, ENVS*1060, GEOG*1300, GEOG*1350, GEOL*1050, GEOL*1100

Territorial Acknowledgement
Acknowledging the territory on which we learn and work honours the relationship between lands/waters and the Indigenous ancestors and stewards of them. This acknowledgement is adapted from the University of Guelph Indigenous Resource Centre and Student Life.

The University of Guelph rests on the traditional territory of the Attawanderon people. We therefore acknowledge the Attawanderon people and offer our respect to Anishinaabe, Haudenosaunee and Métis neighbours as the university and community strive to strengthen our relationships with them. We also recognize the significance of the Dish with One Spoon Covenant to this land. The Dish with One Spoon Covenant is a peace agreement made...
between Indigenous nations before the Europeans arrived. It characterizes our collective responsibility to each other and Mother Earth - we should take only what we need, leave enough for others and keep the dish clean.

Statement on Expectations for Inclusivity

Different perspectives and lived experiences shape who we are and make our communities stronger. I want everyone in our class to feel safe, feel that they belong and that their ideas, perspectives, and lived experiences are important. It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students’ learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.

Organization

In general, there will be three lectures, with some class time being used for introduction or review of assignments or lab concepts. There will be labs (meet in HUTT 240B) throughout the semester beginning the first full week of class in September (week beginning Monday Sept 13, 2021). Also there is a half-day field trip scheduled for early October (Oct 2 or 3, depending on your lab section.

Learning Outcomes

The University of Guelph is a leader in Learning Outcomes at universities. Specifically, there are Learning Outcomes defined that are applicable to all undergraduate students. Additionally, each program and often department has a specific set of Learning Outcomes that contribute to the overall University goals (see the links below for University LOs and Geography LOs). In order to achieve these in GEOG 2000 we have a specific set of Learning Outcomes as well. The course activities and overall course design relate to these Learning Outcomes, the detailed list is on CourseLink, our broad goals for this course or ‘the things you should ‘know’ once you’ve completed the course’ are listed here. If you have any questions or concerns about this, please don’t hesitate to discuss this with me. Essentially you should see this section of the syllabus as part of a contract – this is what I want you to remember/learn in this class and I will do my best to ensure you have every opportunity to learn and practice what you’ve learned in this class in order to achieve these learning outcomes.

Upon successful completion of GEOG*2000, students will be able to:

1. Recognize that Earth surface processes exemplify dynamic flows, interactions and exchanges at a variety of spatial and temporal scales.
2. Using a variety of data sets, evaluate Earth surface processes in the larger context of human-environment problems
3. Collect and analyze relevant data and practice interpreting its significance within the appropriate context
4. Practice communicating concepts and data:
   a. Using formal written and visual forms
   b. Through informal oral communication forms
5. Collaborate effectively in a group setting to pursue advanced issues within Earth surface processes that often require mutli- or inter-disciplinary expertise
6. Identify and begin to evaluate geomorphic problems using critical thought in multiple settings/formats (e.g., in class, in the lab, in the field).
7. Related to LO 6 above, address these issues with the appropriate tools/methodology.
8. Begin to develop and synthesize ideas about the importance of holistic, integrative human-environment issues
9. Demonstrate the societal relevance of geographical knowledge and begin to identify how this can be applied to real world Earth surface process issues
10. Appreciate and value the role of respectful and responsible community engagement and active citizenship when addressing Earth surface processes and their role in human-environment issues.

For more information see the following links:

University of Guelph, learning outcomes and Geography, learning outcomes

Fall 2021 GEOG*2000 Geomorphology
CourseLink
Lecture slides are available on D2L (CourseLink) as pdf files. These are OUTLINE slides; attendance during lectures is beneficial to your overall comprehension of the material – plus fun stuff happens at lectures!

Textbook

The 5th edition is also a reliable resource. You should note that the page numbers and assigned readings in the syllabus and sometimes referred to in lectures or assignments match the 6th edition. If you find yourself using an older edition, it might be worth borrowing a new edition or looking over the TOC for the 6th edition in the library to note the discrepancies.

Lab Fee
There is a lab fee of $20.00, which covers the cost of field trips and most* of the lab materials; this is due to your lab instructor before the end of the day on October 1, 2021.

*The Department of Geography, Environment & Geomatics highly values lab and field experiences and as such sets aside funds each year to supplement these important learning opportunities, even with this as a permanent budget item, we still need to collect a lab fee.

Field Trip
Scheduled for October 2 or 3 2021, this is a half-day field trip that involves a pre-trip quiz (online) and post-trip assignment. Details about the field trip will be presented during Lab 1 (e.g., time, meeting place, pre-trip quiz and guidebook). We focus on basic geomorphology principles on the field trip and take you to some excellent examples.

Evaluation (select the scheme before the last day of classes, December 3, 2021)

Scheme A (if you do not select a scheme by Dec 3, this is the scheme you will be evaluated on):
The final grade will be assessed from weekly review quizzes completed online (10%), lab assignments (30% total), and a midterm (30%) and final exam (30%). Quizzes are based on information presented and discussed in lectures, assigned readings and assignments. In summary:

- Weekly Review Quizzes (online) 10%
- Field Project 10%
- Lab Assignments (5 total) 30%
- Midterm (Oct 27) 25%
- Final Exam (cumulative) 25%

*Failure to pass the midterm and/or final may result in failure in the course

Scheme B:
The final grade will be based on the assignments (30% total), midterm (35%), and the final exam (35%). You have access, and are encouraged to complete the weekly review quizzes, but the score on the quizzes will not count toward your final grade, thus the midterm and final exam section of your evaluation is weighted more heavily. Weekly review quizzes, the midterm, and final exam are based on information presented and discussed in lectures, assigned readings and assignments. In summary:

- Field Project 10%
- Lab Assignments (5 total) 30%
- Midterm (Oct 27) 35%
- Final Exam (cumulative) 35%

Failure to pass the midterm and/or final may result in failure in the course

Students with a documented conflict for any assignment, quiz, midterm, or final exam need to see me at least two weeks prior to arrange an alternative time, there is no guarantee that this will be accommodated, but ensuring that you address the issue several weeks in advance will certainly assist the process.
Schedule and Important Dates
Lectures, MWF 10:30am-11:20am, CONFIRM ROOM IN WebAdvisor first week in September

Labs, HUTT 240B, refer to lab schedule below, section details can be found on WebAdvisor

Field trip (according to your lab section, either Saturday Oct 2, or Sunday Oct 3, 2021)

Midterm: In class, Wednesday October 27, 2021

Final Exam: Scheduled in the final exam schedule – Check WebAdvisor late summer, location tba

Turnitin
In this course we will be using Turnitin integrated with the CourseLink Dropbox tool to detect potential plagiarism, unauthorized collaboration, and/or copying as part of the ongoing efforts to maintain academic integrity at the University of Guelph. All materials submitted to the Dropbox will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting inappropriate use. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site. A major benefit of using Turnitin is that students will be able to educate and empower themselves in preventing academic misconduct. In this course you may screen your own assignments through Turnitin as many times as you wish before the due date. You will be able to see and print reports that show you exactly where you have properly and improperly referenced outside source and materials in your assignment. Please contact me if you have questions or concerns about this software.

Online Behaviour
Inappropriate online behaviour will not be tolerated. Examples of inappropriate online behaviour include:
• Posting inflammatory messages about your instructor or fellow students
• Using obscene or offensive language online
• Copying or presenting someone else’s work as your own
• Adapting information from the Internet without using proper citations or references
• Buying or selling term papers or assignments
• Posting or selling course materials to course notes websites
• Having someone else complete your quiz
• Completing a quiz for/with another student when collaboration is not permitted
• Stating false claims about lost quiz answers or other assignment submissions
• Threatening or harassing a student or instructor online
• Discriminating against fellow students, instructors and/or TAs
• Using the course website to promote profit-driven products or services
• Attempting to compromise the security or functionality of the learning management system
• Sharing your username and password
• Recording lectures without the permission of the instructor

How to succeed in this course
I believe success is possible in anything you set your mind to, therefore starting this class and each task associated with it with an engaged, positive and excited attitude puts you well on your way to an excellent experience. There are some other things that will also help you to succeed. Come to class prepared to participate; ask questions; complete your assignments, read them over, read the questions, did you answer and address all the issues? When you are proud of your assignment, hand it in. Talk to me about your assignments; before you hand them and after you get feedback on them. Discussing issues in class, in the hall, in the lab or wherever, often makes the point and the issue clearer than just considering it once. Learning and comprehending concepts is not done through memorization, I rarely test memory, I want to know that you understand and can relate the concept back to me or to someone else. However, in order to do these things, you need to have a set of tools that often include vocabulary, so these tools will be important to your success. Have fun, I always remember fun things, and events that were mediocre or uninteresting I easily forget. If you come with the right attitude, I will do my best to make this a fun, interesting and exciting class.
Tentative GEOG*2000 F21 Schedule (schedule may change depending on progress)

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture Topic</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Sept 10</td>
<td>Course Intro, logistics and learning outcomes, Geomorph Principles, Equilibrium</td>
<td>Skim Ch 1</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>No Labs</td>
<td>No Labs</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td><strong>Philosophical &amp; methodological history to geomorph, &amp; Internal/external forces</strong></td>
<td>Chapter 2</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td><strong>Resisting Forces &amp; Driving vs Resisting Forces</strong></td>
<td>Chapter 2</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td><strong>Physical Background to Canada &amp; Tectonic setting</strong></td>
<td>Chapter 2</td>
</tr>
<tr>
<td>1</td>
<td>Lab 1</td>
<td><em>Intro to Labs and Assignment 1 - Data Analyses in Geomorphology, Maps Refresher</em></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td><strong>Canadian Tectonic Setting cont &amp; Rock cycle, major rocks and minerals</strong></td>
<td>Chapter 3</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td><strong>Bowen Reaction series &amp; Weathering Introduction/Review</strong></td>
<td>Chapter 3/4</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td><strong>Chemical weathering</strong></td>
<td>Chapter 4</td>
</tr>
<tr>
<td>2</td>
<td>No Lab</td>
<td>No Labs</td>
<td>No Labs this week</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td><strong>Physical Weathering &amp; Soil formation &amp; Soil geomorphology</strong></td>
<td>Chapter 4</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td><strong>Slope form and processes intro &amp; Infinite slope model</strong></td>
<td>Chapter 5</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td><strong>Slope hydrology &amp; Mass wasting (parts of chapter 9 here too)</strong></td>
<td>Chapter 5 / 9 (parts)</td>
</tr>
<tr>
<td>3</td>
<td>Lab 2</td>
<td><em>Global Position Systems (GPS) and Tracking Hazards</em></td>
<td>Field trip Oct 2 or 3</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td><strong>Introduction to glaciers and glacial processes</strong></td>
<td>Chapter 6</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td><strong>Glacial processes cont.</strong></td>
<td>Chapter 6</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td><strong>Glacial processes cont.</strong></td>
<td>Chapter 6</td>
</tr>
<tr>
<td>4</td>
<td>No Lab</td>
<td>No Labs</td>
<td>No Labs this week</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td><strong>Oct 12 Thanksgiving – no class</strong></td>
<td>Chapter 7</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td><strong>Glacial landscapes</strong></td>
<td>Chapter 7</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td><strong>Glacial landscapes cont.</strong></td>
<td>Chapter 7</td>
</tr>
<tr>
<td>5</td>
<td>No Lab</td>
<td>No Labs</td>
<td>No Labs this week (Thanksgiving)</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td><strong>Conclude glacial processes and landforms</strong></td>
<td>Ch 6/7</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td><strong>Last Glacial Max – Canadian Focus</strong></td>
<td>Chapter 8</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td><strong>Ice Ages: Canadian landscape at LGM and since</strong></td>
<td>Chapter 8</td>
</tr>
<tr>
<td>6</td>
<td>Lab 3</td>
<td><em>Lab 3 – part 1 - Stream Gauging and Stream Assessments Field Work (data collection)</em></td>
<td>Field Work</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Midterm review if there is time</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td><em><strong>MID TERM</strong></em></td>
<td>Ch 1-9, lect 0—7.1</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td><strong>Introduction to Fluvial Processes</strong></td>
<td>Skim Ch 10</td>
</tr>
<tr>
<td>7</td>
<td>Lab 3 cont</td>
<td><em>Lab 3 – part 2 Hydrological Data Analyses</em></td>
<td>In the lab</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td><strong>Generating streamflow</strong></td>
<td>Skim Ch 10</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td><strong>Fluvial Processes – measurement &amp; Runoff Ratios in Urban Streams</strong></td>
<td>Chapter 10</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td><strong>Fluvial Processes – transportation, flow competence &amp; Stream erosion</strong></td>
<td>Chapter 10</td>
</tr>
<tr>
<td>8</td>
<td>No lab</td>
<td>No lab This Week</td>
<td>No Lab</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td><strong>Fluvial Landform Introduction &amp; Stream morphology</strong></td>
<td>Skim Ch 11</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td><strong>Landuse impacts on stream form &amp; Urban vs Rural stream issues</strong></td>
<td>Chapter 11</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td><strong>Fluvial process issues in the Guelph region &amp; Case studies</strong></td>
<td>Chapter 11</td>
</tr>
<tr>
<td>9</td>
<td>Lab 4</td>
<td><em>Lab 4 – Bedforms and Planforms</em></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td><strong>Coastal processes and landforms – introduction (parts of Ch 12 are used here too)</strong></td>
<td>SkimCh13/12(parts)</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td><strong>The Wave environment &amp; Sea level changes and its impact on coasts</strong></td>
<td>Chapter 13</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td><strong>Eustatic and Isostatic sea level changes &amp; Case studies</strong></td>
<td>Chapter 13</td>
</tr>
<tr>
<td>10</td>
<td>No Lab</td>
<td>No Lab</td>
<td>No Lab</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td><strong>Introduction to coastal landforms &amp; Coasts of Canada</strong></td>
<td>Chapter 14</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td><strong>Beach environment &amp; Barrier environment</strong></td>
<td>Chapter 14</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td><strong>Deltas and estuaries &amp; Fraser River, St Lawrence, Mackenzie, Mississippi deltas</strong></td>
<td>Chapter 14</td>
</tr>
<tr>
<td>11</td>
<td>Lab 6</td>
<td><em>Coastal Classification</em></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td><strong>Environmental Geomorphology &amp; Role of Geomorphologist &amp; Professional Geoscientists</strong></td>
<td>Chapter 16</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td><strong>Learning outcomes reviewed, the next steps</strong></td>
<td>Chapter 16</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td><strong>Course wrap-up, exam review, closing discussions</strong></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>No Lab</td>
<td>No Lab</td>
<td>No Lab</td>
</tr>
</tbody>
</table>

Fall 2021 GEOG*2000 Geomorphology
GEOG*2000 Geomorphology Lab Schedule

Laboratory Schedule - Fall 2021

*Week 0: No Labs
Week 1: Lab 1, meet your TA, go over lab logistics, data collection & topo maps
      Assignment 1 – Data Analyses in Geomorphology, Maps Refresher
Week 2: No Lab
Week 3: Lab 2 – Global Positioning Systems, Surveying, Tracking Hazards
      Assignment 2 – Monitoring Hazards using GPS
Week 4: No Lab
Week 5: No Lab (Thanksgiving)
Week 6: Lab 3 – Part 1 - Stream Gauging and Stream Assessments Field Work (data collection)
Week 7: Lab 3 – Part 2 - Stream Gauging and Hydrological Data Analysis
      Assignment 3 → Stream Assessments and Characterization
Week 8: No Lab
Week 9: Lab 4 – Bedforms and planforms,
      Assignment 4 – Describing and evaluating fluvial change
Week 10: No Lab
Week 11: Lab 5 – Wave energy and coastal classification mapping
      Assignment 5 – Relationship between wave energy theory and observations
Week 12: No Lab

*Weeks are numbered starting with the first FULL week of the semester, so week 1 starts on Monday September 13, week 0 is Sept 9 and 10.

***UNLESS CLEARLY STATED OTHERWISE, LAB ASSIGNMENT SUBMISSIONS ARE COMPLETED INDEPENDENTLY AND MUST BE YOUR ORIGINAL WORK***

The initial lab meetings will be held in Hutt 240B. You are expected to make use of Excel or similar spreadsheet programs to carry out the analyses required.

Midterm: In class, Wednesday October 27, 2021

Final Exam: Scheduled during the final exam period, this is cumulative.
Lab discussion/email
A separate discussion board for each lab/TA will be set up on CourseLink so that if you have questions related to the lab you can post a message there and either someone in the class or one of the TAs can answer it. It will also serve as a repository for FAQs, so if you have a question, check here first to see if an answer has been posted. Please do this rather than e-mail your TA directly.

E-mail Communication
As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

When You Cannot Meet a Course Requirement
When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the undergraduate calendar for information on regulations and procedures for Academic Consideration.

Drop Date
The last date to drop one-semester courses, without academic penalty, is the last day of classes in the semester (December 3, 2021). For regulations and procedures for Dropping Courses, see the Undergraduate Calendar.

Copies of out-of-class assignments
Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility
The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community’s shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Student Accessibility Services as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the Student Accessibility Services website.

Academic Misconduct
The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor. The Academic Misconduct Policy is detailed in the Undergraduate Calendar.

Recording of Materials
Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources
The Academic Calendars are the source of information about the University of Guelph’s procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.