**GEOL 3210: Geomorphology**

**Introduction:**

Geomorphology is the study of the shape of the Earth and the processes by which the surface is modified and transformed. The landforms you see today are dynamic and changing. During the course of this class, we will (figuratively) create topography through tectonic uplift, modify the surface through weathering to create sediment and soils, erode and transport that sediment through a variety of processes (rivers, glaciers, hillslopes), and deposit that sediment to form new depositional landforms. Geomorphologists deal with time scales from real-time changes or annual fluxes to decadal- or century-scale changes to thousands or even millions of years. We usually don’t dwell on billions of years.

One of the goals of this class is to get you to think like geomorphologists. By the end of the course, you should be able to road trip across the country, see the landscape with an enhanced set of observational skills, and describe the processes that formed those landscapes. In addition, you should gain a set of portable field and data analysis skills that may be useful in many environmental fields.

**Goals of course:**

By the end of this course, you should be able to:

1. Link process with form. You should be able to look at any landscape on Earth and be able to describe which processes shaped the features you see and how the feature was formed.
2. Read a topographic map, interpret an air photo, use Google Earth, and use ArcGIS for simple spatial analyses.
3. Describe the geomorphic processes operating in the Duluth area and be able to link past environments to present landforms.
4. Collect and analyze field data pertaining to fluvial, hillslope, and soil processes.
5. Set up and solve basic quantitative problems, estimate order of magnitude importance, and interpret graphical data.
6. Learn the structure and organization of a scientific paper, and write a full scientific paper.

**Instructor:** Dr. Karen Gran

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**TA:**

Email:

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**Time:** Lecture MF 9:00 – 9:50, HH 216 Lab T 2:00-5:50, Chem 207

**Text:** *Process Geomorphology*, 5th Edition, by Ritter, Kochel, and Miller.

The text is on reserve in the library (4th edition). 4th and 5th editions are very similar and either works.

There will be outside readings which can be accessed through the class website.

**Class Website:** We will have a class website through Moodle. You can access it by going to MyUMD or directly through this link: <https://ay13.moodle.umn.edu/course/view.php?id=4382>. This website will be the place to go to get outside readings, class powerpoints after lecture, and any group data sets that are being distributed.

**Labs:** We will be outside for as many labs as possible at the start of the term. Please dress appropriately! You should wear sturdy shoes, layers appropriate to the weather, and bring a raincoat. Make sure you have a clipboard and a ruler. You might also want water and a snack.

The labs are an INTEGRAL part of the course. They will build upon topics discussed in class and lab write-ups and exercises will comprise half of your grade. Assignments will be due the following Wednesday unless otherwise noted. If you miss a lab, you will receive a zero for that week’s assignment. Late assignments will be reduced 10% for every day they are late (1 day late = -10%, 2 days late = -20%, etc.). There is not a separate exam for lab, but lab material will be integrated into the class exams.

**Course Framework:**

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| Week | Dates | Topic | Required  Reading | Lab |
| I | Sept. 3-6 | Introduction to geomorphology | Ch. 1, 2 | Lab 1: Field Observations and Topo Maps |
| II | Sept. 9-13 | Soils & Weathering | Ch. 3 | Lab 2: Soils |
| III | Sept. 16-20 | Hillslope Processes | Ch. 4 + Montgomery paper (Fri) | Lab 3: Hillslopes I – Bagley |
| IV | Sept. 23-27 | Hillslope Processes | Ch. 4 | Lab 4: Hillslopes IISlumps & Slides |
| V | Sept 30 - Oct 4 | Hydrology; Rivers | Ch. 5 | Lab 5: Rivers I  Amity GIS lab |
| VI | Oct. 7-11 | **Midterm #1: Monday, Oct. 7th**  Rivers | Ch. 6 | Lab 6: Rivers II  Tischer Creek |
| VII | Oct. 14-18 | Rivers, Deltas | Ch. 7 | Lab 7: Mission Creek (joint with sed/strat) |
| VIII | Oct. 21-25 | **Proposals Due Monday, Oct. 21st**  Coastal Processes | Ch. 13 | Lab 8: Mission Creek (joint with sed/strat) |
| IX | Oct. 28-Nov.1 *GSA Week* | Glaciers | Ch. 9, 10 | Independent Project Time |
| X | Nov. 4-8 | Glaciers | Ch. 9, 10 | Lab 9: Continental Glaciation |
| XI | Nov. 11-15 | Glaciers  **Midterm #2: Friday, Nov. 15th** | Ch. 9, 10 | Lab 10: Alpine Glaciation & Climate |
| XII | Nov. 18-22 | Tectonic Geomorphology  Landscape Evolution | Pinter and Brandon paper | Lab 11: Tectonic Geomorphology & Landscape Evolution |
| XIII | Nov 25-29 | Aeolian Geomorphology  *No class Friday: Happy Thanksgiving!* | Ch. 8 | Lab 12: Aeolian Processes |
| XIV | Dec 2-6  *AGU week* | Modeling in geomorphology  Anthropogenic Geomorphology  **Mini-Midterm #3: Friday, Dec. 6th** | Hooke paper (Monday) | Lab 13: modeling; & Independent Project Time |
| XV | Dec. 9-13 | **Student presentations – Tuesday in lab**  Environmental Restoration/ Applied Geomorphology |  | Presentations |
| Final | Tues., Dec. 17 | **Final Paper Due, noon** |  |  |

**Note:** Although this schedule was put together following much deliberation, it may still change.

**Attendance Policy:** Please attend class and lab. Attendance is both required and expected. In-class discussions, exercises, and labs cannot be made up. You are expected to attend and participate in class and lab. Participation is part of your grade. If you need to miss a class for an approved reason, please let me know in advance.

**Exams**: There will be three midterm exams during the course, two full-length exams and one “mini-exam”. NO MAKEUP EXAMS WILL BE GIVEN UNLESS SPECIAL ARRANGEMENTS ARE MADE **PRIOR** TO THE EXAM DATE. If an emergency arises, please contact me before the exam.

**Group Work:** I encourage you to study in groups and work on labs in groups. However, the work you turn in should be your own.

**Course Grade:** 35% of the course grade based on three midterm exams (1, 2: 13% each; 3: 9%)

45% of the course grade will be based on lab & homework assignments

15% final project (presentation and report)

5% participation, including in-class discussions and activities

**Grading:** Grades will be posted on e-gradebook or Moodle as papers are graded.

Final point totals may be graded on a curve with the following guarantees:

90% and above A

80% B

70% C

60% D

< 60% F

**Prerequisites:** Geology 1110 or 2110, Math 1250 or equivalent. Credit will not be granted if credit has been received for 2210.

**Students with disabilities:**It is the policy and practice of the University of Minnesota Duluth to create inclusive learning environments for all students, including students with disabilities. If there are aspects of this course that result in barriers to your inclusion or your ability to meet course requirements – such as time limited exams, inaccessible web content, or the use of non-captioned videos – please notify the instructor as soon as possible. You are also encouraged to contact the Office of Disability Resources to discuss and arrange reasonable accommodations. Please call 218-726-6130 or visit the DR website at www.d.umn.edu/access for more information.

**Additional UMD Policies:**

[Academic Integrity](http://www.d.umn.edu/catalogs/current/pol_proc/acad_integ.html)**:**

Academic dishonesty tarnishes UMD’s reputation and discredits the accomplishments of students.  Academic dishonesty is regarded as a serious offense by all members of the academic community.  UMD’s Student Academic Integrity Policy can be found at: <http://www.d.umn.edu/conduct/integrity/>

[Student Conduct Code](http://www1.umn.edu/regents/policies/academic/Student_Conduct_Code.pdf)**:**

Appropriate classroom conduct promotes an environment of academic achievement and integrity.  Disruptive classroom behavior that substantially or repeatedly interrupts either the instructor's ability to teach, or student learning, is prohibited. Student are expected adhere to Board of Regents Policy: Student Conduct Code: <http://www1.umn.edu/regents/policies/academic/Student_Conduct_Code.pdf>

[Teaching & Learning: Instructor and Student Responsibilities](http://www.d.umn.edu/vcaa/TeachingLearning.html)**:**

UMD is committed to providing a positive, safe, and inclusive place for all who study and work here.  Instructors and students have mutual responsibility to insure that the environment in all of these settings supports teaching and learning, is respectful of the rights and freedoms of all members, and promotes a civil and open exchange of ideas. To reference the full policy please see:  <http://www.d.umn.edu/vcaa/TeachingLearning.html>

[Excused Absences](http://www.d.umn.edu/vcaa/ExcusedAbsence.html)**:**

Students are expected to attend all scheduled class meetings.  It is the responsibility of students to plan their schedules to avoid excessive conflict with course requirements. However, there are legitimate and verifiable circumstances that lead to excused student absence from the classroom.  These are subpoenas, jury duty, military duty, religious observances, illness, bereavement for immediate family, and NCAA varsity intercollegiate athletics.  For complete information, please see: <http://www.d.umn.edu/vcaa/ExcusedAbsence.html>

[Appropriate Student Use of Class Notes and Course Materials](http://www.d.umn.edu/vcaa/ClassNotesAppropriateUseof.html)**:**

Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. For additional information, please see: <http://www.d.umn.edu/vcaa/ClassNotesAppropriateUseof.html>