



**GEOG 339x – Mapping and Landscape Analysis**  
(4 credits)

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***TENTATIVE SYLLABUS***      ***Spring 2015***

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**INSTRUCTOR**

Chris Maio  
907-474-5651  
[cvmaio@alaska.edu](mailto:cvmaio@alaska.edu)

**OFFICE**

Reichardt Building, Room 368

**OFFICE HOURS**

Monday     3:00 – 5:00  
Thursday   10:00 – 12:00  
And by appointment

**LECTURES**

Murie Building, Room 103  
Monday –Wednesday – Friday  
Class Time: 9:15 -10:15

**LABORATORY**

Reichardt Building, Room 235  
Thursdays     2:00 – 5:00

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**BOOK**

Readings will be provided by the instructor.

**COURSE DESCRIPTION**

This course will build student knowledge and practical experience regarding the visualization and mapping of landform evolution in response to Earth surface processes, especially in relation to climate change. The first half of the course will introduce students to a variety of research methods used in landscape analysis and mapping. During the second half of the semester examples of landscape formation and evolution specific to Alaska's dynamic environment will be discussed. A semester long research project will allow students to gain experience in the collection and use of a variety of datasets used in landscape analysis. Students will document and present their research through a report and scientific poster.

**COURSE GOALS**

The course will provide students with an understanding of Earth surface processes, the resulting landforms, and how these landforms evolve through time. Students will gain practical experience using the tools and technologies necessary for landscape analysis including topographic map interpretation, GIS, unmanned aerial vehicles, and ground penetrating radar. Student will carry out a research project and present their results in a public forum.

## TEACHING METHODS

This course will combine traditional lectures with hands-on learning activities. Lecture topics will focus on methods used in landscape analysis as well as the fundamental principles of geomorphology. This course is designed to provide students with practical experience learning and applying field and lab methods to visualize and quantify landscape change through time. Two Saturday field trips will serve as a capstone to integrate course concepts and research methods to explore first-hand the dramatic landscapes of interior Alaska.

## LEARNING OUTCOMES

- Students will gain a familiarity with different types of landforms particular to Alaska and examine the process of landform evolution through time.
- Students will gain practical experience using topographic maps, unmanned aerial vehicles, ground penetrating radar, and LIDAR.
- Students will gain practice in the scientific method via the development and implementation of a semester long research project.
- Students will learn how to design publishable map figures using Adobe Illustrator.
- Students will improve the quality of their writing, visual, and oral communication skills through the development of a research report and the design and presentation of a scientific poster.
- Students will gain experience reading scientific papers and leading a group discussion about research methods and topics.

## COURSE POLICIES

### *Expectations*

Students are expected to come to class and lab prepared and on time. This includes reading the assigned material, having completed all assignments that are due, and prepared to discuss the course material. There is also an expectation that students within the lab and classroom will act with professionalism and be respectful to other students, the instructor, and guests. A failure to meet these expectations will result in a lowering of the final course grade and dismissal from the class in which the expectations were not met.

### *Attendance and Participation*

Attendance and participation within lectures and labs will be worth a total of 10% of the final grade. Attendance for labs and Saturday field trips is mandatory. If there is an emergency or other important obligation which prevents a student from attending lectures they are expected to email the instructor prior to the absence. If students do not email prior to the absence, points will be deducted from the participation grade and other related course work. Students are responsible for ascertaining what materials and/or assignments were missed even if their absence from class was excused.

### *Media Devices*

Cell phones are to be switched off or placed in silent mode. Calls, Texts, and web browsing is not allowed during class periods, unless the instructor (prior to class) has granted permission. Violation of this policy will lead to a loss of grades. Laptops may be used for in-class note taking but use of email, social media or viewing of websites not relevant to the current class is not allowed, and will lead to a loss of grades.

### *Blackboard*

All course materials and important announcements will be posted on Blackboard. This includes the most current version of the syllabus, lectures, handouts, and assigned readings. Students are required to visit Blackboard regularly to stay up to date with course materials and announcements.

## **STUDENT CONDUCT**

UAF students are subject to the Student Code of Conduct. UAF will maintain an academic environment in which freedom to teach, conduct research, and administer the university is protected. Students will benefit from this environment by accepting responsibility for their role in the academic community. The principles of the student code are designed to encourage communication, foster academic integrity and defend freedoms of inquiry, discussion and expression across the university community. For a complete description of the University's Code of Conduct please go to [http://www.uaf.edu/catalog/catalog\\_14-15/pdf/04\\_Academics.pdf](http://www.uaf.edu/catalog/catalog_14-15/pdf/04_Academics.pdf) and see Academics and Regulations.

**ACADEMIC HONESTY WILL BE STRICTLY ENFORCED WITHIN THIS COURSE. CHEATING AND PLAGIARISM WILL NOT BE TOLERATED. ANY STUDENT CAUGHT PLAGIARIZING OR CHEATING WILL RECEIVE AN AUTOMATIC ZERO ON THE ASSIGNMENT IN QUESTION AND MAY BE REPORTED TO THE UNIVERSITY AUTHORITIES TO FACE FAILURE IN THE COURSE OR EXPULSION.**

## **STUDENT SUPPORT SERVICES**

### *Students with Disabilities*

UAF is committed to equal opportunity for students with disabilities. Students with disabilities are encouraged to contact the coordinator of Disability Services (Mary Matthews) at the Center for Health & Counseling (907-474-7043 or [uaf-disabilityservices@alaska.edu](mailto:uaf-disabilityservices@alaska.edu)), to enlist the appropriate support. I will collaborate to provide accommodations and support or services to assist students in meeting the goals of the course.

### *Veteran Support*

It is an honor to have veterans attending UAF and every accommodation will be made to support their success in this course. Please let me know if there is anything that can be done to facilitate your transition or continuation of an academic career and contact Walter Crary below.

Walter Crary is the Veterans Service Officer at the Veterans Resource Center, 111 Eielson Building. 907-474-2475.

Email: [wecrary@alaska.edu](mailto:wecrary@alaska.edu)

Fairbanks Vet Center 907-456-4238. VA Community Based Outpatient Clinic at Ft. Wainwright is 907-361-6370.

**STUDENT EVALUATION**

<b>Assignment</b>	<b>Points</b>	<b>Total Percent Course</b>
<b><i>RESEARCH PROJECT</i></b>		<b>25%</b>
Project Proposal and Bibliography	20	
Data Collection and Analysis	50	
Map Figure 1	20	
Map Figure 2	20	
Report Draft 1	40	
Report Final Draft	60	
Lab Presentation	40	
<b><i>SCIENTIFIC POSTER</i></b>		<b>10%</b>
Poster Draft 1	30	
Printed Poster	40	
UAF Research Day Presentation	30	
<b><i>EXAMS</i></b>		<b>20%</b>
Midterm Exam	100	
Final Exam	100	
<b><i>LAB EXERCISES</i></b>		<b>15%</b>
Lab 1	25	
Lab 2	25	
Lab 3	25	
Lab 4	25	
Lab 5	25	
Lab 6	25	
<b><i>READING DISCUSSIONS</i></b>		<b>10%</b>
Discussion Lead 1	25	
Discussion Lead 2	25	
Discussion Lead 3	25	
Discussion Participant	25	
<b><i>FIELD TRIP COMPONENT</i></b>		<b>10%</b>
Field Trip 1	40	
Field Trip 2	60	
<b><i>ATTENDANCE &amp; PARTICIPATION</i></b>		<b>10%</b>
Attendance	50	
Participation	50	

**Grading Scale**

<b>Grade</b>	<b>%</b>	<b>Grade</b>	<b>%</b>
A+	97-100	C+	77-79
A	93-96	C	74-76
A-	90-92	C-	70-73
B+	87-89	D+	67-69
B	83-86	D	63-66
B-	80-82	D-	60-62
		F	<60

**ADDITIONAL ASSIGNMENT INFORMATION**

- 1) **Lab Exercises:** Labs will consist of a series of exercise that will be carried out during the 3 hours period with additional outside work required. Many labs will take-place outside in freezing temperatures. Students should dress for the elements.
- 2) **Research Project:** The research project will focus on using geospatial datasets to visualize and quantify landscape change through time. The topic will be based on student interests, ongoing research, or assigned by the instructor upon request. Projects that document research methods will also be acceptable. The project can be carried out individually or groups of two.
- 3) **Exams:** The exams will include multiple choice, matching, T/F, short answer, and essay questions. The final exam will be primarily drawn from material covered during the second half of the course but will also require students to integrate earlier concepts. A review session will be held prior to each exam.
- 4) **Research Poster:** Students will produce a scientific poster based on their research project. The poster will be presented at the UAF Research Day held on Tuesday, April 28.
- 5) **Field Trip:** Field trips will serve as a capstone experience to integrate course knowledge and research techniques. They will occur Saturdays meeting on campus at 8 am and returning in the evening. Students should bring a snacks, lunch, and warm outdoor clothing. There will be pre-trip readings and post-trip written assignments.
- 6) **Reading Discussions:** A series of articles provided by the instructor will serve as the reading material for this course. One to two students will present the material and guide a group discussion. Students not leading the discussions will demonstrate they have read the materials through their participation.

**TENTATIVE LECTURE & LAB EVALUATION SCHEDULE**

<b>Due Date</b>	<b>Assignment</b>	<b>Points</b>
1/16-5/4	Attendance and Participation (Lab & Lecture)	100
1/16-5/4	Course Readings, Discussion Leader/Participant	100
2/5	Lab 1: Air Photo Analysis	25
2/12	Lab 2: Shoreline Change Analysis	25
2/18	Research Project: Proposal and Bibliography	20
2/19	Lab 3: Digital Elevation Models	25
2/26	Lab 4: GPR	25
	Research Project: Data collection and analysis	60
3/9	Midterm Exam	100
3/11	Research Project: Map Figure 1	20
3/23	Research Project: Report Draft 1	40
3/26	Lab 5: UAV Data Collection	25
3/28	Lab 6: UAV Data Analysis	25
4/2	Field Trip 1 Assignment	40
4/6	Research Project: Map Figure 2	20
4/13	Research Project: Final Report	60
4/17	Research Poster: Draft 1	20
4/23	Research Project: Lab Presentation	40
	Research Poster: Final Draft	30
4/28	UAF Research Day Poster Presentation	40
5/2	Field Trip 2 Assignment	60
5/5 – 5/8	Final Exam	100
	<b>TOTAL POINTS</b>	<b>1000</b>

**TENTATIVE LECTURE SCHEDULE**

<b>Week</b>	<b>Date</b>	<b>Lectures</b>	<b>Reading</b>	<b>Assignments Due</b>
1	16 Jan F	<i>Lecture 1: Course Introduction</i>	Syllabus Review	
2	19 Jan M	<b>NO CLASS</b> <b>Alaska Civil Rights Day</b>		
	21 Jan W	<i>Lecture 2: Syllabus and Research Project</i>	Syllabus Review	
	23 Jan F	<i>Lecture 3: Introduction to Geomorphology: Processes, Landforms, and Time</i>	Reading 1	
3	26 Jan M	<i>Lecture 4: Methods used in Landscape Analysis</i>		
	28 Jan W	<i>Lecture 5: The History and Art of Map Making</i>	Reading 2	
	30 Jan F	<i>Lecture 6: The Creation and use of Topographic Maps</i>		
4	02 Feb M	<i>Lecture 7: Modern and Historical Aerial Photography in Landscape Analysis</i>	Reading 4	
	04 Feb W	<i>Lecture 8: Shoreline Change Analysis using the USGS DSAS Tool: Case Study</i>		
	06 Feb F	<i>Lecture 9: The use of Light Detection and Ranging Data (LIDAR)</i>	Reading 5	
5	09 Feb M	Research Project: Development of proposal and bibliography		
	11 Feb W	<i>Lecture 10: Digital Elevation Models</i>		
	13 Feb F	<i>Lecture 11: TBA</i>		
6	16 Feb M	<i>Lecture 12: Mapping the Subsurface using Marine and Terrestrial Geophysics</i>	Reading 6	
	18 Feb W	<i>Lecture 13: Ground Penetrating Radar: Case Study</i>		Proposal and bibliography
	20 Feb F	<i>Lecture 14: Unmanned Aerial Vehicles (UAV's)</i>	Reading 7	
7	23 Feb M	<i>Lecture 15: Thematic Maps and Historical GIS</i>	Reading 8	
	25 Feb W	<i>Lecture 16: Designing Map Figures using Adobe Illustrator and ArcGIS</i>		
	27 Feb F	<i>Lecture 17: Methods of Dating Landscape Change</i>		
8	02 Mar M	<i>Lecture 18: Paleo-Proxy Records Based on Sediment Cores: Case Study</i>	Reading 9	
	04 Mar W	<b>EXAM REVIEW</b>		
	06 Mar F	<b>Study Session</b>		
9	09 Mar M	<b>MIDTERM EXAM</b>		

Week	Date	Lectures	Reading	Assignments Due
	11 Mar W	Post-Exam Review Research Project: Figures and Report		Research Project: Map Figure 1
	13 Mar F	<i>Lecture 19: Coastal Geomorphology</i> Breakfast Provided!	Reading 10	
10	Mar 16-20	<b>SPRING BREAK</b>		
11	23 Mar M	<i>Lecture 20: Dynamic Coastlines of Alaska</i>		Research Project: Report Draft 1
	25 Mar W	<i>Lecture 21: Paraglacial Processes and Landforms</i>	Reading 11	
	27 Mar F	<i>Lecture 22: Alaska's Permafrost Landscapes in a Changing Climate (Guest Lecturer TBA)</i>	Reading 12	
12	30 Mar M	Field Trip Review Research Project: map figures and report		
	01 Apr W	<i>Lecture 23: Glacial Geomorphology</i>		
	03 Apr F	<i>Lecture 24: Pleistocene Glaciation in Interior Alaska</i>	Reading 13	
13	06 Apr M	<i>Lecture 25: TBA</i>		Research Project: Map Figure 2
	08 Apr W	Study Session		
	10 Apr F	Research Project: Design and Presentation of Scientific Posters		
14	13 Apr M	<i>Lecture 26: The Great Alaskan Earthquake of 1964</i>		Research Project: Report Final
	15 Apr W	<i>Lecture 27: Tectonic Processes and Resulting Landforms in Southcentral Alaska</i>	Reading 14	
	17 Apr F	<i>Lecture 28: Human Modification of Natural Landforms</i>		Research Poster: Draft 1
15	20 Apr M	<i>Lecture 29: Global Climate Change: Driver of Environmental Change</i>		
	22 Apr W	<i>Lecture 30: Mapping Erosion along Alaska's Arctic Coastline</i>	Reading 15	Research Presentation Poster: Final Draft
	24 Apr F	<b>NO CLASS – SPRINGFEST</b>		
16	27 Apr M	<i>Lecture 31: TBA</i>		
	<b>28 Apr Tue</b>	URSA Research Fair		URSA Research Presentation
	29 Apr W	NO CLASS		
	01 May F	<b>EXAM REVIEW</b>		
17	04 May M	LAST DAY CLASSES Study Session		
	May 5-08	<b>FINAL EXAM</b>	Location TBA	

**LABORATORY AND FIELD TRIP COMPONENT**

Attendance for labs and Saturday field trips is MANDATORY. All lab and field trip assignments are due by the beginning of the next lab period, unless otherwise mentioned by your instructors. Any late submissions will incur a penalty of 10% for that assignment per day it's late. If bad weather or other circumstances prevents a field trip the alternate date will be Saturday, May 2.

**TENTATIVE LAB and FIELD TRIP SCHEDULE**

<b>Lab (L) Field Trip (FT)</b>	<b>Thursdays (unless noted)</b>	<b>Subject</b>	<b>Location</b>	<b>Assignment Due</b>
L1	29-Jan	Lab 1: Air Photo Analysis	Lab	
L2	5-Feb	Lab 2: Shoreline Change Analysis using the USGS DSAS tool	Lab	Lab 1
L3	12-Feb	Lab 3: Digital Elevation Models	Computer Lab	Lab 2
L4	19-Feb	Lab 4: Mapping the subsurface using ground penetrating radar	Outside Meet at Lab	Lab 3
L5	26-Feb	Research Project Data Collection	Outside Meet at Lab	Lab 4
TBA	5-Mar	TBA	TBA	
L6	12-Mar	Lab 5: Unmanned aerial vehicles (UAV) in landscape analysis	Outside Meet at Lab	
No Lab	19-Mar	<b>SPRING BREAK</b>		
L7	26-Mar	Lab 6: UAV data processing and analysis	Lab	Lab 5
FT1	SATURDAY 28-Mar	Field Trip 1 – TBA	Meet at Lab	Lab 6
L8	2-Apr	Research Project Data Collection	Outside Meet at Lab	FT 1
L9	9-Apr	Research Project: Design of map figures and scientific posters	Computer Lab	
Alternate	16-Apr	Lab Make-Up Alternate	TBA	
L10	23-Apr	Research Project presentations Food Provided!	Lab	
FT2	SATURDAY 25-Apr	Field Trip 2: Geomorphology of Interior Alaska	Outside Meet at Lab	
L11	28-Apr TUESDAY	UAF RESEARCH DAY Poster Presentations	Campus Center	
FT-Alt.	SATURDAY 2-May	Field Trip: Bad Weather Alternate	Outside Meet at Lab	FT 2