GEOS 330 – THE DYNAMIC ALASKAN COASTLINE (3 credits)

TENTATIVE SYLLABUS
Spring 2016

INSTRUCTOR	Chris Maio, Assistant Professor
OFFICE	Reichardt 368
OFFICE HOURS	Wednesday 1:00 pm – 2:00 pm Thursday 12:00 pm – 1:00 pm And by appointment
CONTACT	907-474-5651 cvmaio@alaska.edu
LECTURES	Reichardt 204 Thursdays Class Time: 2:00 pm -5:00 pm

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REQUIRED FIELD TRIP

The field trip is a mandatory component of the course and will take place from Thursday, April 7th to Monday, April 11th. The trip is tentatively being planned for Homer via air transportation. If air travel is not possible we may need to drive. The trip will include outdoor research and learning activities in the Kachemak Bay area. A $200 course fee and travel expenses apply.

TEXT

There is no required text. All readings will be provided via Blackboard.

PREREQUISETS

Junior standing; GEOG F111 or GEOS F101; NRM 338 or equivalent GIS coursework

COURSE DESCRIPTION

This class will provide an interdisciplinary perspective on the dynamic coastal landscape of Alaska from Southcentral to the Arctic. Alaska's diverse coastal system provides abundant ecosystem services and globally important resources. Through a semester long research project students will learn how to measure and map coastal changes associated with natural and human perturbations. We will delve into the driving geological, oceanographic, and climate processes shaping Alaska's coast. An overnight field trip is required and will serve as an active learning opportunity to integrate course knowledge with hands on field work. Special fees apply.

COURSE GOALS

The goals of this course are to develop a comprehensive understanding of the fundamental processes shaping Alaska's coastline over multiple spatial and temporal scales. With a foundation of coastal knowledge and skills students will be able to carry out coastal change research and critically assess the implications of climate driven change.

TEACHING METHODS

This is a combined field methods, lecture, and discussion course that requires students to attend all classes, the field trip, and keep up with assigned readings. Students will also be required to work independently on research projects. There will be guest lecturers over the course of the semester who will provide expert training on research methods. All students will develop a research project associated with coastal change mapping and analysis. The field trip will serve as a capstone learning experience integrating course concepts with real-world examples and applications.

LEARNING OUTCOMES

- Students will gain practice in the scientific method via the development and implementation of a research project.
- Students will learn how to read, discuss, and present scientific literature.
- Students will learn and develop critical thinking skills associated with Alaskan coastal processes over multiple spatial and temporal scales.
- Students will learn and experience using ArcGIS software and the application of the USGS Digital Shoreline Analysis System.
- Students will learn and experience methods of shoreline monitoring including the use of Real-time kinematic GPS, Trimble Business Center software, and time lapse photography.
- Students will learn and experience the acquisition of ground penetrating radar in coastal settings.

COURSE POLICIES

EXPECTATIONS

Students are expected to come to all classes 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 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.

PARTICIPATION AND PROFESSIONALISM

In class, participation and professionalism will be worth a total of 15% of the final grade. If there is an emergency or other important obligation which prevents a student from attending class 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.

STUDENT CONDUCT

UAF students are subject to the Student Code of Conduct. 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 and see Academics and Regulations. Students found violating the Student Code of Conduct will receive an automatic zero on the assignment in question and may face more serious action.

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 (x7043). If you need classroom accommodations or other support, please make an appointment with Mary K. Matthews at the Office of Disability Services at (uaf-disabilityservices@alaska.edu), to enlist the appropriate support. I will collaborate to provide accommodations to assist students in meeting course goals.

WRITING SUPPORT

Students are encouraged to make use of the Writing Center (8th floor, Gruening Building) where you can take a draft of any writing and be helped with editing. http://www.uaf.edu/english/writing-center/

VETERAN SUPPORT

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

Walter Crary is the Veterans Service Officer at the Veterans Resource Center, 111 Eielson Building. 474-2475.
Email: wecrary@alaska.edu

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

STUDENT EVALUATION

ASSIGNMENT		POINTS	% GRADE
RESEARCH PROJECT			**30%**
Research Proposal		60	
Data acquisition/analysis/visualization		60	
Report		100	
Presentation		80	
FIELD TRIP			**20%**
Assignment		100	
Attendance & Participation		100	
EXAMS			**20%**
Midterm		100	
Final		100	
READING DISCUSSION			**15%**
Participant	8 each	100	
Discussion Lead	1 each	50	
ATTENDANCE & PARTICIPATION			**15%**
Attendance		50	
Participation		100	
EXTRA CREDIT – CURRENT EVENT			***3%***

Grading Scale

Grade	%	Grade	%
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) **Research Project:** The research project will focus on applying available datasets to visualize and quantify coastal change through time. For example, GIS could be used to determine the rate of shoreline change at a particular coastal site in Alaska. The topic will be based on student interests, ongoing research, or, upon request, assigned by the instructor as part of broader research projects currently being carried out. Projects that report on and document research methods (GPR, GPS, Drones, etc.) are also acceptable.

2) **Field Trips:** The field trip will serve as a capstone experience to integrate course knowledge and research techniques. We will fly from Fairbanks to Homer where we will stay in dormitory housing for 3 nights. Using Homer as our base, we will travel to a variety of locations and learn and experience the area though the guidance of local experts. The highlight of the trip will be a trip across Kachemak Bay to learn about intertidal ecosystems, geology, and ancient archeological sites. There will be pre-trip readings and a post-trip written assignment.

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) **Reading Discussions:** A series of articles provided by the instructor on Blackboard 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. Attendance will be taken prior to each discussion.

5) **Extra-Credit Current Event:** To receive points a student must clip/print a newspaper/magazine article of a current event that relates Alaska's coastline. Mount the article on a larger piece of paper and next to it paste a one paragraph summary of the event. The student will then briefly (3-4 minutes) present the current event at the beginning of class. Printed digital formats will also be accepted if all components are included. Each submission will be worth 15 points with a limit of two per student.

TENTATIVE SCHEDULE

CLASS	THEME	ACTIVITY	READING	ASSIGN. DUE
Class 1 1/14	• Introduction & Course Expectations • Intro to Coastal Geomorphology • Tools of the trade	• Alaska Coastal Geoscience Lab visit: Tools of the Trade	Syllabus	TBA
Class 2 1/21	• Barrier Beach Systems • Marine Transgression and Regression • Tidal Processes and Datums	• Sand Box • Reading Discussion 1	Reading 1	TBA
Class 3 1/28	• Extreme Storm Events • Paleo-Proxy records of coastal change	• Reading Discussion 2 • Lab: Sediment Core Analysis	Reading 2	TBA
Class 4 2/4	• TBA	• TBA	TBA	TBA
2/11	NO CLASS	NO CLASS	NO CLASS	NO CLASS
Class 5 2/18	• GIS Methods for Shoreline Change Analysis • Geospatial Data Acquisition • DSAS Application Southwestern Alaska Coastal Processes	• Computer Lab: DSAS • Reading Discussion 3Flume table •	Reading 3	TBA
Class 6 2/25	• YK Delta coastal processes • Arctic coastal processes • Permafrost coastlines **Guest Speaker -**	• Reading Discussion 4 • Research Project • Reading Discussion 5	Reading 4 Reading 5	TBA
Class 7 3/3	• Southcentral Alaska • Tectonics • Glacial modifications • Archeology	• Research Project • Reading Discussion 6	Reading 6	TBA
Class 8 3/10	**MIDTERM EXAM** • Kachemak Bay Ecosystems	• Reading Discussion 7 • TBA	Reading 7	TBA
Class 9 3/24	• Techniques for Coastal Monitoring • Trimble RTK-GPS **Guest Speaker –**	• Shoreline Profiles with RTK GPS • Stake and camera measurements	TBA	TBA
Class 10 3/31	• Trimble RTK–GPS – Data collection • Trimble Business Center data processing **Guest Speaker –**	• Computer Lab • Reading Discussion 8	Reading 8	TBA

WEEK	THEME	ACTIVITY	READING	ASSIGN. DUE
FIELD TRIP Class 11 4/6	**FIELD TRIP – POSSIBLE TRAVEL** • Possible Travel Day	• TBA		**FIELD TRIP**
FIELD TRIP Class 12 4/7	**FIELD TRIP** • Fairbanks to Homer • Intro to Kachemak Bay Geology • Islands and Oceans	• Sand Box • Reading Discussion 1		**FIELD TRIP**
FIELD TRIP Class 13-14 4/8	**FIELD TRIP** • Intertidal ecosystems • Glacial and tectonic morphology • Early coastal peoples	• Lab: Sediment Core Analysis • Reading Discussion 2		**FIELD TRIP**
FIELD TRIP Class 15-16 4/9	**FIELD TRIP** • Diamond Creek Trail • Bluff Erosion • Cook Inlet • Beluga Lake Sediment Coring	• Computer Lab: DSAS • Reading Discussion 3		**FIELD TRIP**
FIELD TRIP Class 17 4/10	**FIELD TRIP** • Ed Berg • Homer to Fairbanks			**FIELD TRIP**
FIELD TRIP 4/11	**FIELD TRIP – POSSIBLE TRAVEL** • **Possible Travel Day**	*TBA*	*TBA*	**FIELD TRIP**
5/2	**TBA**			**Research Report Due**
5/6	**FINAL EXAM**			