G E O M O R P H O L O G Y

THE STUDY OF THE EARTH'S SURFACE

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A Survey of Geomorphology, including lectures on:
LANDFORMS AND PROCESSES
NEOTECTONICS AND TECTONIC LANDFORMS
VOLCANOES AND VOLCANIC PROCESSES
WEATHERING AND EROSION
GEOHYDROLOGY and FLUVIAL PROCESSES
DESERT LANDFORMS AND EOLIAN PROCESSES
THE 'ICE AGES' and GLACIAL PROCESSES
PERIGLACIAL GEOMORPHOLOGY and LANDFORMS
ENERGY FLOW IN GEOMORPHIC SYSTEMS
LANDFORM EVOLUTION
MASS WASTING and EROSION
NATURAL HAZARDS
GEOMORPHIC PROVINCES OF ALASKA AND THE WORLD
PAST GLOBAL CLIMATE CHANGE

Professor: **James Begét**
Dept. Geology and Geophysics
364 Natural Science Building

Fall, 2006 GEOS 304 Geomorphology

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COURSE SYLLABUS

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Course Information

Course number:	GEOS 304
Credits:	3
Place:	235 NCSI
Time:	Tu/Th 9:45-11:15

Instructor: Dr. James Begét (Jim)

Office:	Natural Science Building 364
Phone:	474-5301
Office Hours:	Wednesday 9-12..(also by appointment)

Textbook: Bloom, A. L. 2004. Geomorphology (3rd edition)
Waveland Press, Illinois, USA

Course Introduction:

Geomorphology is the scientific study of the geologic history, processes, and features found at the surface of the earth. Geomorphology approaches these questions by determining the origin and characteristics of all of the earth's landforms, such as mountains, lakes, lava flows, fault scarps, beaches, terraces, moraines, etc.

The question of the origin of the various landscapes and features that people see around them is of universal interest to all peoples. The earliest known writings on natural science, in the 4th century BC by Aristotle and Herodotus, include observations of geomorphology and related natural phenomena. Geomorphology was an important part of the earliest scientific work done by Leonardo da Vinci and others during the Renaissance, and by Darwin, Humboldt, J. W. Powell, and others during the scientific exploration of the earth during the 16-20th centuries.

Today, a diverse suite of landforms has been described and catalogued from all parts of the earth's surface. However, the exploration and discovery of new landforms continues as it is an important part of the studies being of surface geomorphic features on the planets and moons of our solar system.

Modern geomorphology focuses on the types and rates of processes which create and modify landforms. These studies have "real-world" applications in evaluating climate and environmental change and natural hazards.

This course will survey the landforms of the world, analyze the processes which operate in particular climates or tectonic settings to produce distinctive landforms, and discuss how geomorphology can be used to evaluate climate change and natural hazards in Alaska and other areas.

Course Goals:
1) Recognition of the diversity and natural history of landscapes and landforms in Alaska and throughout the world.
(2) Introduction to modern methods of study of landforms, Quaternary sediments, and physical processes which modify the earth's surface.
(3) Applications of geomorphology and surficial geology to natural hazards evaluations, engineering geology, land-use planning, economic geology, archeology, paleoecology, paleoclimatology, and other earth science problems.

Course Format:
Material will be presented in a lecture format. Slides will be shown to illustrate landforms and processes. Class discussion and participation is encouraged. Readings from the text supplement the lecture material and are required. Several "mini-labs" during the term will introduce students to geomorphologic data. A few films will be shown. A guest lecture or two is possible.

Field Trips
Geomorphology is a field science. There will be a required one-day field trip in late September, and we will use one class period to look at geomorphic features around the UAF campus.

Assigned Readings:
Sections of the textbook are assigned each week in the syllabus. The readings are keyed to class lectures. You should try to read the text before the lecture. Exam questions will come from both the readings and lecture.

Class Exercise (mini-labs):
Several short exercises will be completed during the term. These "mini-labs" are designed to demonstrate fundamental concepts. You will need a pocket calculator for some exercises.

Examinations:
There will be three examinations, each covering one-third of the term. Each will count about 30% of the grade. Exams will cover lecture, readings, and in-class exercises. Exams will not be cumulative. No make-up exams will be given. If you know ahead of time that you must miss an exam, or if you miss an exam for an emergency (i.e. some natural hazard, of course) or other reason, please let me know as soon as possible and so we can arrange a replacement exam by appointment.

Grading:
Each of the three exams will count 30% of the final grade, so 90% of a student’s grade is based on the objective scores on the exams. The remaining 10 % is based on completion of 3 of the 4 in-class mini-labs and the class fieldtrip

LECTURE OUTLINE AND ASSIGNED READING (REVISED)

PART ONE: **CONSTRUCTIONAL PROCESSES**

Date		Lecture Topics	Assigned Reading
AUGUST	31	Organization Meeting, syllabus	3-12B
SEPT.	5	Syllabus Scope of Geomorphology History of Geomorphology Constructional processes	19-34B
	7	Neotectonic landforms, processes	
	12	continued	35-48B, 67-87B
	14	Tectonic geomorphology Constructional landforms, Faulting and folding	
	19	Paleoseismology, hazards	
	21	Neotectonics/ Alaskan seismic hazards	
	23	Geomorphology Field Trip—Fairbanks area	
	26	intro volcanic geomorphology	92-113B
	28	Volcanic landforms, Volcanic processes	
OCT.	3	Mt. St. Helens./AK. volcanoes	
	5	First Examination	

PART TWO: **WEATHERING/SURFICIAL PROCESSES**

	10	Chemical weathering	117-146B
	12	chemical weathering	
	17	Physical weathering Physical weathering (continued)	
	19	soils, karst	147-168B

	24	mass wasting landslides, rockfalls	169-188B
	26	Hillslope morphology progressive evolution	188-195B
	31	Fluvial processes	13-16B, 198-227B
NOV.	2	Fluvial landforms	231-274
	7	Paleohydrology, flood hazards	
	9	Second mid-term examination	

PART THREE: **SURFICIAL PROCESSES---CONTINUED**

	14	Shoreline processes	417-442B,
	16	Shoreline landforms	445-459B
	21	Eolian-arid processes Eolian landforms	p. 324-330S; 277-305B p. 331-340S
	23	THANKSGIVING HOLIDAY	
	28	Loess in Fairbanks/global climate change	
	30	Periglacial processes Periglacial landforms	p.388-397S; 309-322B p. 397-405S
DEC	5	Geomorphology of glaciers ice sheets & valley glaciers	p. 417-429S p. 353-372B
	7	Glacial Geology Glacier landforms	p. 430-467S; p. 373-390B p. 468-492S

Final Examination

MERRY CHRISTMAS, HAPPY WINTER HOLIDAY, AND A HAPPY NEW YEAR!!!