

FORMAT 1

Submit original with signatures + 1 copy + electronic copy to Faculty Senate (Box 7500). See http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/ for a complete description of the rules governing curriculum & course changes.

TRIAL COURSE OR NEW COURSE PROPOSAL

SUBMITTED BY:

Department: Department of Geology and Geophysics; College/School: CNSM; Prepared by: Jessica Larsen; Phone: 7992; Email Contact: jflarsen@alaska.edu; Faculty Contact: Jessica Larsen

1. ACTION DESIRED (CHECK ONE): Trial Course [] New Course [X]

2. COURSE IDENTIFICATION: Dept: GEOS Course #: F380 No. of Credits: 3

Justify upper/lower division status & number of credits:

This course will be taught at the 300 level suitable for those enrolled in the Earth Sciences B.A. program and B.S. Geology and Geophysics majors who wish to take it as one of their upper division electives. The 3-credit load for the course is suitable for the subject material, which does not require lab work for complete understanding of the course materials.

3. PROPOSED COURSE TITLE: Geological Hazards

4. To be CROSS LISTED? YES/NO [NO] If yes, Dept: [] Course #: []

5. To be STACKED? YES/NO [NO] If yes, Dept: [] Course #: []

6. FREQUENCY OF OFFERING: Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) — or As Demand Warrants

7. SEMESTER & YEAR OF FIRST OFFERING (AY2011-12 if approved by 3/1/2012; otherwise AY2012-13) AY2013-2014, Spring semester

RECEIVED SEP 21 2012

8. COURSE FORMAT:

NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school's curriculum council. Furthermore, any core course compressed to less than six weeks must be approved by the core review committee.

COURSE FORMAT: (check all that apply) [] 1 [] 2 [] 3 [] 4 [] 5 [X] 6 weeks to full semester

OTHER FORMAT (specify)

Mode of delivery (specify lecture, field trips, labs, etc) Lecture and field trips

9. CONTACT HOURS PER WEEK: [3] LECTURE hours/weeks [0] LAB hours/week [] PRACTICUM hours/week

Note: # of credits are based on contact hours. 800 minutes of lecture=1 credit. 2400 minutes of lab in a science course=1 credit. 1600 minutes in non-science lab=1 credit. 2400-4800 minutes of practicum=1 credit. 2400-8000 minutes of internship=1 credit. This must match with the syllabus. See http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/guidelines-for-computing-/ for more information on number of credits.

OTHER HOURS (specify type) Field trips to local sites relevant to the coursework will be included.

10. COMPLETE CATALOG DESCRIPTION including dept., number, title, credits, credit distribution, cross-listings and/or stacking (50 words or less if possible):

GEOS F3XX Geological Hazards
3 credits
Survey of natural hazards and the disasters they cause, with emphasis on geological hazards

Governance 10/3/12 TLP

Leah Berman 9/24/12 TLP

in Alaska. Investigation of hazardous phenomena, prediction and mitigation. Topics include: earthquakes, volcanoes, tsunamis, weather/climate, and asteroid impacts. Provides a foundation in basic geological hazards related science, suitable for use in teaching, communications, policy, and emergency management careers. (3+0)

11. **COURSE CLASSIFICATIONS:** Undergraduate courses only. Consult with CLA Curriculum Council to apply S or H classification appropriately; otherwise leave fields blank.

H = Humanities S = Social Sciences

Will this course be used to fulfill a requirement for the baccalaureate core? **If YES, attach form.**

YES: NO:

IF YES, check which core requirements it could be used to fulfill:

O = Oral Intensive, **Format 6** W = Writing Intensive, **Format 7** Natural Science, **Format 8**

12. **COURSE REPEATABILITY:**

Is this course repeatable for credit? YES NO

Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

How many times may the course be repeated for credit?

TIMES
 CREDITS
 CREDITS

If the course can be repeated for credit, what is the maximum number of credit hours that may be earned for this course?

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course?

13. **GRADING SYSTEM:** Specify only one. Note: Later changing the grading system for a course constitutes a Major Course Change.

LETTER: PASS/FAIL:

RESTRICTIONS ON ENROLLMENT (if any)

14. **PREREQUISITES**

GEOS F101X or GEOS F120X; GEOS F112X or GEOS F106X or permission of the instructor

These will be required before the student is allowed to enroll in the course.

15. **SPECIAL RESTRICTIONS, CONDITIONS**

16. **PROPOSED COURSE FEES**

\$0

Has a memo been submitted through your dean to the Provost for fee approval?
Yes/No

17. **PREVIOUS HISTORY**

Has the course been offered as special topics or trial course previously?
Yes/No

NO

If yes, give semester, year, course #, etc.:

18. **ESTIMATED IMPACT**

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

The course will require classroom facilities with standard projection and computer equipment. The instructor will investigate making the course eventually accessible for web-based, distance delivery to broaden participation among students at other UA campuses, and other universities and colleges. Access for students to the Geology Department computer lab for extra computing resources will be arranged as-needed.

19. **LIBRARY COLLECTIONS**

Have you contacted the library collection development officer (kljensen@alaska.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

No

Yes

This course will not require an extensive need for library collections. The collections already housed by Rasmuson will be sufficient.

20. IMPACTS ON PROGRAMS/DEPTS

What programs/departments will be affected by this proposed action?

Include information on the Programs/Departments contacted (e.g., email, memo)

There are two courses listed in the UAF catalog that are broadly similar, but are taught at the 400 level, not the 300 level as proposed. The first is GE 441 – Geohazards Analysis in the Geological Engineering department. The GE 441 course is aimed for engineering students at the 400 level and is thus not suitable for BA students in Earth Sciences who will not have taken the required courses in math and physics. The second course is GEOG 488 - Geographic Assessment and Prediction of Natural Hazards. It is scheduled every other Fall, but the instructor has taken a position at another institution, so the future of the course is uncertain. Since our course focuses on Geological Hazards, would be taught during the spring, and at the 300 level, we do not anticipate it will conflict with the GEOG 488 course.

21. POSITIVE AND NEGATIVE IMPACTS


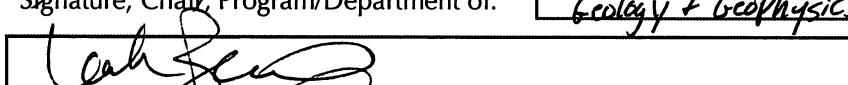
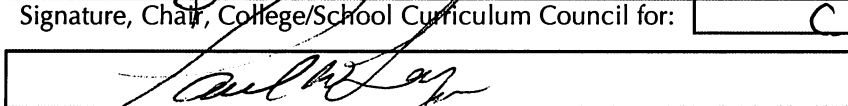
Please specify **positive and negative** impacts on other courses, programs and departments resulting from the proposed action.

JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. Use as much space as needed to fully justify the proposed course.

Natural hazards are a fact of life, and their impacts can be severe and far-reaching. Alaska is one of the most geologically active areas on the planet and its citizens are vulnerable to many hazards. An understanding of types of hazards that routinely and negatively impact people in Alaska, as well as elsewhere around the world, is important for students at UAF who are interested in using their degrees for employment in the following fields: teaching, journalism, science writing, emergency management, political science, and business (i.e. insurance companies). It would indeed be beneficial for all citizens to have a basic understanding of the causes of natural hazards, how they are predicted and mitigated, and how to prepare in case a disaster strikes near home. This new course will be part of a re-design of the Earth Sciences B.A. program within the Department of Geology and Geophysics. This new course will be part of a new concentration within the B.A. focused on Geologic Hazards and Mitigation.

APPROVALS: Add additional signature lines as needed.

	Date	9/20/12
Signature, Chair, Program/Department of: <u>Geology + Geophysics</u>		
	Date	9/26/2012
Signature, Chair, College/School Curriculum Council for: <u>CNSM</u>		
	Date	10/1/12
Signature, Dean, College/School of: <u>CNSM</u>		
	Date	

Signature of Provost (if applicable)

Offerings above the level of approved programs must be approved in advance by the Provost.

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

	Date	
Signature, Chair Faculty Senate Review Committee: <input type="checkbox"/> Curriculum Review <input type="checkbox"/> GAAC <input type="checkbox"/> Core Review <input type="checkbox"/> SADAC		

ADDITIONAL SIGNATURES: (As needed for cross-listing and/or stacking)

	Date	
Signature, Chair, Program/Department of:		
	Date	
Signature, Chair, College/School Curriculum Council for:		
	Date	
Signature, Dean, College/School of:		

Geological Hazards

SYLLABUS: (GEOS F380, 3 credits)

INSTRUCTOR: Jessica Larsen

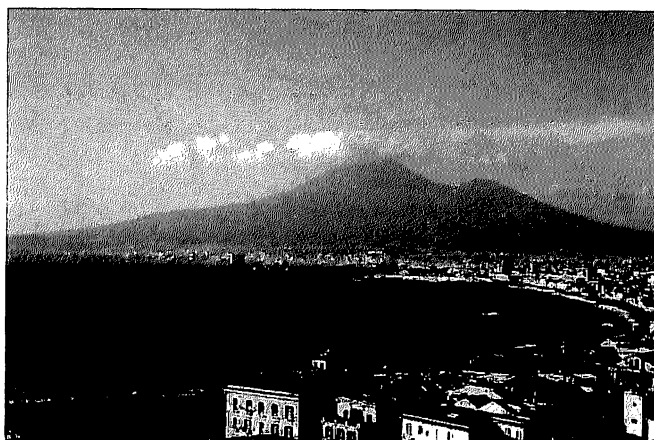
OFFICE: REIC 344

TELEPHONE: 907-474-7992

EMAIL: jflarsen@alaska.edu *best way to contact me*

LECTURES: M-W-F 2:15-3:15 PM

OFFICE HOURS: M-W 3:30-4:30 PM



INTRODUCTION

It is very likely that we all have been, or will be, affected to some degree by a natural disaster. For example, your professor lived in Santa Cruz, CA during the M 6.9 Loma Prieta Earthquake. We lived without running water or electricity for about 5 days, in a city with brick buildings reduced to rubble. Imagine a similar scenario in Fairbanks during the dead of winter – we are all to some degree vulnerable to disaster (though humans often forget this!). This course will cover a survey of natural hazards and their societal impacts. The course will emphasize geologic, climate, weather, and extraterrestrial hazards, with a focus on impacts and examples from Alaska. The course will be lecture-based, but include in-class activities that extend and compliment lectures and homework assignments.

TEXTBOOK

Hyndman and Hyndman, 2011: Natural Hazards and Disasters, 3rd edition. Brooks/Cole.

WEBSITE RESOURCES (TO BE REVISED AS NEEDED)

We will use website resources to explore the distributions and types of hazards and their impacts globally, both in and outside of class for lectures, activities, and assignments. A select list of the types of resources we will explore:

FEMA website: www.fema.gov

Pacific Disaster Center, University of Hawaii: <http://www.pdc.org/iweb/pdchome.html>

University of Colorado, Boulder Natural Hazards Center: <http://www.colorado.edu/hazards/>

Alaska Volcano Observatory: www.avo.alaska.edu

Alaska Earthquake Information Center: www.aeic.alaska.edu

Alaska Seismic Hazards Safety Commission: <http://seismic.alaska.gov/>

West Coast and Alaska Tsunami Warning Center: <http://wcatwc.arh.noaa.gov/>

Pacific Tsunami Warning Center: <http://ptwc.weather.gov/>

SERC: <http://serc.carleton.edu/earthlabs/hurricanes/laboverviews.html>

OBJECTIVES

This course is being developed to provide anyone with an interest in learning more about natural hazards with basic information about types, causes, and how humans can both be vulnerable and resilient. This is a subject that explores how each type of hazard can impact people who are vulnerable, and the steps that can be taken to reduce the impacts of associated disasters. The course is particularly well suited to students seeking careers in teaching, journalism or science writing, sociology, political science, public policy, emergency management, and business. A

primary objective is to give students a working knowledge of the science behind natural hazards, to help them better prepare for their chosen careers.

To meet this goal, the course objectives are: 1) Explore major types of geologic and climate/weather related hazards, and the geoscience behind their causes. 2) Examine “case studies” that present ways that humans have tried to mitigate disasters associated with different types of hazards. 3) Explore the resulting societal impacts through case studies of recent hazardous events. 4) Apply what is learned in lecture through in-class and associated homework activities.

LEARNING OUTCOMES

At the end of the course, you will begin to see how geoscientists specializing in hazardous phenomena view the natural and human world. The course will provide avenues to apply what you have learned through class, homework, case study, and writing activities. Upon completion, you will be able to:

- ❖ Explain the basic science behind geologic and climate/weather related natural hazards (i.e. as a teacher instructing his/her pupils)
- ❖ Appraise modern methods used to help mitigate the negative impacts (disasters) that can come from natural hazards
- ❖ Assess in a basic way the degree of vulnerability in select populations from different types of hazards
- ❖ Apply retrospective analysis when examining “case studies” of hazards that have occurred recently. Be able to discuss what worked and what failed during recent natural disasters (such as the terrible earthquake and tsunami in Japan 2010, or Hurricane Katrina).
- ❖ Assess known (or previously unknown) vulnerabilities to a given hazard and discuss ways that people are (or should be) working on mitigation strategies through a clearly written, well-organized report.

INSTRUCTIONAL METHODS: The lecture format will be balanced between “traditional” lecturing (using PowerPoint and other web-based resources) and active learning methodologies. During lectures we will use clickers and brief group discussions (ConcepTests) to enhance your grasp on the material. Participation and attendance will be graded based on self-graded quizzes and ConcepTest participation (though the clickers).

Exams: There will be three exams, each worth 10% of your grade. You must be present in class the days of each of the exams, and there will be no make-up exams given. The only exception to this rule is in case of medical or family emergency, with documentation (e.g., Dr.’s note). The exams are not cumulative, and will each cover approximately 1/3 of the course material.

Activities/Homework assignments: Every 2 to 4 class periods will feature an in-class activity that provides hands-on learning experiences. These activities will include a component that is taken home and completed as homework. There will be a total of 8 graded assignments completed as homework. The assignments will be due one week from the day they are handed out, during the beginning of the class time period. The length of the assignment will be reasonable for completion within 1 week. Each assignment is worth 5% of your grade and I will drop your lowest homework score. Late homework will be docked 10% per day past their due date.

Writing Assignment: 3 weeks from the end of the semester, you will be assigned a short writing project. This project will focus on investigating a likely or common hazard that could impact your

hometown (i.e. where you grew up or where your family lives presently. Not necessarily Fairbanks, unless you grew up here!). You will write about the basic science behind the hazard, in what ways your town is vulnerable or at risk, what current efforts or plans are in place for mitigation, how you or your family (or community members) can adequately prepare for the hazard, and what recommendations you have for improving or lessening the vulnerability. The assignment will have very specific requirements that will be given to you to follow closely. This assignment is worth 20% of your grade.

ACCESSIBILITY

The Office of Disability Services implements the Americans with Disabilities Act (ADA) and ensures that UAF students have equal access to the campus and course materials. I will work with the Office of Disability Services (474-7043) to provide reasonable accommodation to students with disabilities. Please let me know at the beginning of the course if accommodations should be provided.

SUPPORT SERVICES

The Department of Geology & Geophysics computer lab is located in 316 Reichardt. If you need access to a computer to complete course work, you can request a computer account from Instructor Chris Wyatt (email: chris.wyatt@alaska.edu). Tell him you are a student in GEOS 194 and that you need the computer lab resources for your coursework.

COURSE POLICIES

You must be present to take all exams as scheduled. Exam #4 will be given on the day and time scheduled by the Provost during final exam week. Please plan accordingly. Make-up examinations will be given only in case of personal or family illness or emergency (physician's or dentist's note required).

STUDENT CONDUCT

The Student Code of Conduct is listed on page 49 of the UAF catalog. The code outlines your rights and responsibilities, as well as conduct that is prohibited by the University. Please be familiar with the contents of this document.

GRADING

Letter grades for the course will be given according to the following percentage scale: A+ (100–97), A (96–93), A- (92–90), B+ (89–87), B (86–83), B- (82–80), C+ (79–77), C (76–73), C- (72–70), D+ (69–67), D (66–63), D- (62–60), F (59–0).

Exams: 30% (10% each)

Homework/In class activities: 40% (5% each)

Written report: 20%

Class participation/attendance: 10%

Proposed Lecture Schedule (to be modified as needed)

DATE	LECTURE	HOMEWORK/ACTIVITY	READING ASSIGNMENT
1/20	Introduction		Chapter 1
1/23	Plate Tectonics activity	#1. Discovering Plate Boundaries (DPB) 1	Chapter 2
1/25	Cont'd	DPB 2	
1/27	Cont'd	DPB 3 and turn in maps	
1/30	Earthquake Faults	#2. Assign earthquake homework	
2/1	Earthquakes: Waves and location	5 slinky exercise	
2/3	Earthquakes: Size, Shaking, Estimating probability		
2/6	Earthquakes: Risk and mitigation		
2/8	Interior Alaska	Earthquake homework due	
2/10	1964 Earthquake		
2/13	Tsunamis: Causes		
2/15	Tsunamis: Wave speed/Inundation		
2/17	Tsunamis: Monitoring and mitigation		
2/20	Tsunamis: Alaska and the Pacific	#3 Travel times - inundation activity	
2/22	Review Session		
2/24	Exam #1		
2/27	Volcanoes: Intro		
2/29	Volcanoes: Intro cont'd and eruption types		
3/2	Volcano Hazards		
3/5	Volcano monitoring		
3/7	Volcano hazard mitigation	#5 Hazard map activity	
3/9	Katmai 1912		
Spring Break:		3-12 to 3-16	
3/19	Landslide basics	#6 Soil properties activity	

3/21	Landslide types, causes and examples		
3/23	Weather/climate basics	#7 Assign climate homework	
3/26	Climate change basics		
3/28	Permafrost/Sea ice		
3/30		Discussion session; Climate homework due	
4/2	Floods		
4/4	Review Session		
4/6	Exam #2		
4/9	Waves, Beaches, Erosion		
4/11	Coastal erosion in AK		
4/13	Wildfires		
4/16	Wildfires in AK		
4/18	Thunderstorms/Tornadoes		
4/20	Hurricanes		
4/23	Katrina 2005	#8 Hurricane Activity	
4/25	Impacts: Asteroids and Comets		
4/27	SPRING FEST	NO CLASS	
4/30	Vulnerability and Risk		
5/2	Societal Implications		
5/4	Review Session		

Exam #3 will be given during the scheduled day/time during finals week