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(email electronic copy to fysenat@uaf.edu)**

PROGRAM/DEGREE REQUIREMENT CHANGE (MAJOR/MINOR)

SUBMITTED BY:

Department	Geology & Geophysics	College/School	CNSM
Prepared by	Sarah Fowell	Phone	x7810
Email Contact	sjfowell@alaska.edu	Faculty Contact	Sarah Fowell

See <http://www.uaf.edu/uafgov/faculty/cd> for a complete description of the rules governing curriculum & course changes.

PROGRAM IDENTIFICATION:

DEGREE PROGRAM	Earth Science
Degree Level: (i.e., Certificate, A.A., A.A.S., B.A., B.S., M.A., M.S., Ph.D.)	B.A.

A. CHANGE IN DEGREE REQUIREMENTS: (Brief statement of program/degree changes and objectives)

We have added 3 options to the Earth Science major in order to: 1) decrease the time to degree by reducing both the number of required credits and the number of required courses offer on an alternate year basis; 2) offer a greater variety of degree options; 3) clarify potential career paths for students in the degree program; 4) make it possible for students who wish to teach earth science in secondary school to complete their degree and obtain their teaching license in 4 years; and 5) increase program enrollments.

B. CURRENT REQUIREMENTS AS IT APPEARS IN THE CATALOG:

Earth Science

College of Natural Science and Mathematics
 Department of Geology and Geophysics
 907-474-7565
www.uaf.edu/geology/

B.A. Degree

Downloadable PDF

Minimum Requirements for Degree: 130 credits

This program provides broad training in various aspects of earth science. It is especially applicable to those wishing to teach earth science or who are entering a field such as resource management.

Basic course work is designed to meet the National Science Teachers Association requirements for teaching secondary school earth science. Students arrange additional required course work and specialization emphasis in consultation with an undergraduate advisor and a faculty member from the appropriate department. Students wishing to enroll in this degree program should contact the head of the geology and geophysics department.

The earth sciences B.A. degree meets the undergraduate requirements for prospective secondary earth science teachers (grades 7 - 12).

Major -- B.A. Degree

1. Complete the general university requirements. (As part of the core curriculum

requirements, complete: NRM F303X*, CHEM F103X and CHEM F104X or CHEM F105X and CHEM F106X or PHYS F103X and PHYS F104X).

2. Complete the B.A. degree requirements. (As part of the B.A. degree requirements, complete: PHIL F481 for the humanities requirement.)
3. Complete the following program (major) requirements: *
 - GEOG F339--Maps and Landscape Analysis (4)
 - or GEOS F408--Photogeology (2) 2 ---4 credits
 - GEOG F307--Weather and Climate--3 credits
 - GEOG F402--Resources and Environment--3 credits
 - GEOS F101X--The Dynamic Earth--4 credits
 - GEOS F112X--The History of Earth and Life--4 credits
 - GEOS F225--Field and Computer Methods In Geology--3 credits
 - GEOS F262--Rocks and Minerals--3 credits
 - GEOS F304--Geomorphology--3 credits
 - GEOS F315W--Paleobiology and Paleontology (4)
 - or BIOL F328O--Biology of Marine Organisms (3)--3 - 4 credits
 - GEOS F422--Remote Sensing (3)
 - or NRM F338--Introduction to GIS (3)--3 credits
 - MSL F111X--The Oceans--4 credits
 - NRM F101--Natural Resource Conservation and Policy--3 credits
 - PHYS F175X--Introduction to Astronomy--3 creditsComplete an additional approved 9 credit specialization emphasis at the F300-level or above with emphasis in geology, geography, biology, natural resources management or other earth science-related field as approved by the undergraduate advisor--9 credits
4. Complete any UAF minor except geology. If appropriate, courses used to satisfy the specialization emphasis requirement can also be applied towards the requirements for a minor.
5. Minimum credits required--130 credits

* Students must earn a C grade (2.0) or better in each course.

Note: The following courses are recommended to fulfill the upper-division writing and oral intensive requirements (2 W courses and 1 O course): GEOS F475WO, GEOS F463O, GEOS F315W, GEOG F490WO, NRM F304WO, or NRM F380W.

Note: Geography courses taken to meet the B.A. social science requirement may also be used to fulfill the specialization emphasis and (or) minor requirements. GEOG F402, a major requirement, also satisfies the B.A. social science requirement.

Note: In consultation with an undergraduate advisor, students should prepare an undergraduate study plan that includes specific courses to satisfy the major and minor complexes. This should be completed by the end of the sophomore year.

Note: We strongly recommend that prospective secondary science teachers seek advising from the UAF School of Education early in your undergraduate degree program, so that you can be appropriately advised of the state of Alaska requirements for teacher licensure. You will apply for admission to the UAF School of Education's post-baccalaureate teacher preparation program, a one-year intensive program, during your senior year. The Earth Science B.A. degree requirements will apply to the UAF School of Education during spring 2006 or later for licensure in secondary earth science.



**C. PROPOSED REQUIREMENTS AS IT WILL APPEAR IN THE CATALOG WITH THESE CHANGES:
(Underline new wording strike-through-old wording and use complete catalog format)**

Earth Science

College of Natural Science and Mathematics
Department of Geology and Geophysics
907-474-7565
www.uaf.edu/geology/

B.A. Degree

Downloadable PDF

Minimum Requirements for Degree: ~~130~~ 120-130 credits

This program provides broad training in various aspects of earth systems science. Three options are available: earth systems science, geological hazards and mitigation, and secondary education. The options allow students to focus on different interests and career path during their junior and senior years but offer considerable flexibility during the freshman and sophomore years.

The earth science option offers students a sound background in a broad spectrum of geoscience disciplines, with an emphasis on the interaction between earth systems. The geological hazards and mitigation option is designed for students who wish to pursue careers in communicating science, hazards analysis, or emergency management related to natural disasters. The secondary education option is designed for students who plan to teach earth science in secondary school in Alaska. Requirements for certified teachers have been built in to this option in consultation with the School of Education. Students choosing this option should consult with both the Dept. of Geology & Geophysics and the School of Education for advising.

~~It is especially applicable to those wishing to teach earth science or who are entering a field such as resource management.~~

~~Basic course work is designed to meet the National Science Teachers Association requirements for teaching secondary school earth science. Students arrange additional required course work and specialization emphasis in consultation with an undergraduate advisor and a faculty member from the appropriate department. Students wishing to enroll in this degree program should contact the head of the geology and geophysics department.~~

~~The earth sciences B.A. degree meets the undergraduate requirements for prospective secondary earth science teachers (grades 7–12).~~

Major -- B.A. Degree

1. Complete the general university requirements. (As part of the core curriculum requirements, complete: NRM F303X*, CHEM F103X and CHEM F104X or CHEM F105X and CHEM F106X or PHYS F103X and PHYS F104X).
2. Complete the B.A. degree requirements (see p. 137). (~~As part of the B.A. degree requirements, complete: PHIL F481 for the humanities requirement.~~) Note that social science (s) courses are included in each of the Earth Science options. These courses may also be applied to the B.A. degree requirements.
3. Complete the following foundation courses*:
 - a. GEOS F101X—The Dynamic Earth
or GEOS F120X—Glaciers, Earthquakes and Volcanoes4
 - b. GEOS F112X—The History of Earth and Life
or GEOS F106X—Life in the Age of Dinosaurs.....4

2. Complete the following program (major) requirements:*
- ~~GEOG F339—Maps and Landscape Analysis (4)~~
 - ~~—or GEOS F408—Photogeology (2) 2—4 credits~~
 - ~~GEOG F307—Weather and Climate—3 credits~~
 - ~~GEOG F402—Resources and Environment—3 credits~~
 - ~~GEOS F101X—The Dynamic Earth—4 credits~~
 - ~~GEOS F112X—The History of Earth and Life—4 credits~~
 - ~~GEOS F225—Field and Computer Methods In Geology—3 credits~~
 - ~~GEOS F262—Rocks and Minerals—3 credits~~
 - ~~GEOS F304—Geomorphology—3 credits~~
 - ~~GEOS F315W—Paleobiology and Paleontology (4)~~
 - ~~—or BIOL F328O—Biology of Marine Organisms (3)—3—4 credits~~
 - ~~GEOS F422—Remote Sensing (3)~~
 - ~~—or NRM F338—Introduction to GIS (3)—3 credits~~
 - ~~MSL F111X—The Oceans—4 credits~~
 - ~~NRM F101—Natural Resource Conservation and Policy—3 credits~~
 - ~~PHYS F175X—Introduction to Astronomy—3 credits~~

4. Complete one of the following options:

Earth Science Option I – Earth Systems Science

- a. Complete the following*:
- GEOS F315W—Paleobiology and Paleontology.....4
 - GEOS F304—Geomorphology.....3

b. Complete one course from each of the following areas*:

Earth Systems

- NRM F101—Natural Resource Conservation and Policy.....3
- GEOG F101—Expedition Earth: Introduction to Geography.....3
- MSL F111X—The Oceans.....4
- PHYS F175X—Introduction to Astronomy.....4

Earth Materials

- GEOS F262—Rocks and Minerals.....3
- GEOS F213—Mineralogy.....4

Geospatial Sciences

- GEOS F222—Fundamentals of Geospatial Sciences.....3
- GEOG F338—Introduction to Geographic Information Systems.....3
- GEOS F225—Field and Computer Methods In Geology (2) and
GEOS F408—Photogeology (2).....4

c. Complete one course from any two of the following areas*:

Weather and Climate

- ATM F101X—Weather and Climate of Alaska.....4
- GEOG F307—Weather and Climate.....3

Natural Resources

- GEOG F302—Geography of Alaska.....3
- GEOG F402—Resources and Environment.....3

Geoscience

- GEOS F322—Stratigraphy and Sedimentation.....4
- GEOS F309—Tectonics.....3

Geobiology

- GEOS F485—Mass Extinctions, Neocatastrophism, and the History of Life.....3

GEOS F486—Vertebrate Paleontology.....3

~~d. Complete an 9 additional approved 9 credit specialization emphasis credits at the F300-level or above with emphasis in geology, geography, biology, natural resources management or other earth science-related field as approved by the undergraduate advisor, including one W (writing-intensive) course and one O (oral-intensive) course.--9 credits~~

~~3- e. Complete any UAF minor except geology. If appropriate, Courses used to satisfy the upper-division specialization emphasis requirement can may also be applied towards the requirements for a minor.~~

~~4- f. Minimum credits required--130 120 credits~~

Earth Science Option II – Geological Hazards and Mitigation

a. As part of the core curriculum requirements, complete SOC F100X and COMM 300X.

b. Complete the following*:

PHYS F175X—Introduction to Astronomy.....4
GEOS F3XX—Geological Hazards.....3
STAT F200X—Elementary Probability and Statistics.....3
GEOS F304—Geomorphology.....3
GEOS F406—Volcanology.....3
ED F486O/2—Media Literacy.....3
ENGL F314W,O/2—Technical Writing.....3
HSEM F301—Principles of Emergency Management and Homeland Security...3

b. Complete one course from each of the following areas*:

Earth Materials

GEOS F262—Rocks and Minerals.....3
GEOS F213—Mineralogy.....4

Geospatial Sciences

GEOS F222—Fundamentals of Geospatial Sciences.....3
GEOS F225—Field and Computer Methods In Geology (2) and
GEOS F408—Photogeology (2).....4

Weather and Climate

GEOG F307—Weather and Climate.....3
GEOS F477O—Ice in the Climate System.....3

c. Complete a minimum of two courses in one of the following specialized areas*:

Mitigation

HSEM F434—All Hazards Risk Analysis.....3
HSEM F412—Emergency Planning and Preparedness.....3
HSEM F423—Disaster Response Operations and Management.....3

Communications

COMM F335O—Organizational Communications.....3
COMM F353—Conflict, Mediation, and Communication.....3
COMM F441—Persuasion.....3

d. Complete the requirements for a minor in geology, paleontology, geospatial sciences, geography, communications, journalism, sociology or other field related to communicating and mitigating natural hazards, as approved by the undergraduate advisor.

e. Minimum credits required.....120

Earth Science Option III – Secondary Education

a. Complete the following*:

<u>PSY F101—Introduction to Psychology.....</u>	<u>3</u>
<u>GEOG F101: Expedition Earth: Introduction to Geography.....</u>	<u>3</u>
<u>MSL F111X—The Oceans.....</u>	<u>4</u>
<u>PHYS F175X—Introduction to Astronomy.....</u>	<u>4</u>
<u>GEOS F262—Rocks and Minerals.....</u>	<u>3</u>
<u>GEOS F315W—Paleobiology and Paleontology.....</u>	<u>4</u>
<u>GEOS F475—Presentation Techniques in the Geosciences.....</u>	<u>2</u>

b. Complete one course from each of the following areas*:

Landform Analysis

<u>GEOG F111X—Earth and Environment: Elements of Physical Geography.....</u>	<u>4</u>
<u>GEOS F304—Geomorphology.....</u>	<u>3</u>

Geospatial Sciences

<u>GEOS F222—Fundamentals of Geospatial Sciences.....</u>	<u>3</u>
<u>GEOG F338—Introduction to Geographic Information Systems.....</u>	<u>3</u>
<u>GEOS F225—Field and Computer Methods In Geology.....</u>	<u>2</u>

Weather and Climate

<u>ATM F101X—Weather and Climate of Alaska.....</u>	<u>4</u>
<u>GEOG F307—Weather and Climate.....</u>	<u>3</u>

Natural Resources

<u>GEOG F302—Geography of Alaska.....</u>	<u>3</u>
<u>GEOG F402—Resources and Environment.....</u>	<u>3</u>

Evolutionary Processes

<u>GEOS F309—Tectonics.....</u>	<u>3</u>
<u>GEOS F485—Mass Extinctions, Neocatastrophism, and the History of Life.....</u>	<u>3</u>
<u>GEOS F486—Vertebrate Paleontology.....</u>	<u>3</u>

c. Complete the requirements for a minor in Secondary Education (see p. 158)..... 16

d. Complete the *additional* requirements of the Secondary Licensure Program (see p. 158-160).....19

Note: We strongly recommend that prospective secondary science teachers seek advising from the UAF School of Education early in your undergraduate degree program, so that you can be appropriately advised of the state of Alaska requirements for teacher licensure. You will apply for admission to the UAF School of Education's post baccalaureate teacher preparation program, a one year intensive program, during your senior year. The Earth Science B.A. degree requirements will apply to the UAF School of Education during spring 2006 or later for licensure in secondary earth science.

e. Minimum credits required..... 130

* Students must earn a C grade (2.0) or better in each course.

Note: The following courses are recommended to fulfill the upper division writing and oral intensive requirements (2 W courses and 1 O course): GEOS F475WO, GEOS F463O, GEOS F315W, GEOG F490WO, NRM F304WO, or NRM F380W.

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Note: In consultation with an undergraduate advisor, students should prepare an undergraduate study plan that includes specific courses to satisfy the major and minor complexes. This should be completed by the end of the sophomore year.

D. ESTIMATED IMPACT

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

Despite the new options, the revised program includes only one new course, "Geological Hazards", which was previously approved as a 200-level trial course. Paperwork is included to change this to an upper-division course in order to better meet the needs of students choosing this option. This change will also allow students in the Geoscience program to take the course as an upper-division elective, which will virtually eliminate the risk of cancellation due to low enrollment. This course was created by a recent faculty hire to fulfill her workload. Therefore, no overloads will result from the program changes.

The changes are intended to attract more students and increase enrollments, which will have a positive impact on the departmental budget.

The impact on space is expected to be minimal. Geological Hazards is required only for one option, so we expect we can accommodate the students in one of our existing classrooms (seating 16-20 students). Due to the amount of flexibility in the options, we do not foresee crowding in existing classes as a result of the program revisions.

E. 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)

The School of Education will be affected by the Secondary Education option. We have collaborated with the goal of reducing the time required for students to finish their earth science and secondary licensure requirements by an entire year. Last year the School of Education produced a 5-year plan. By working together and adding flexibility to the Earth Science degree, we have reduced the number of credits to 130, which allows students to complete their degree in 4 years by taking 16-17 credits per semester or taking a couple of courses during the summer. The School of Education has reviewed the revised program and approved the Secondary Education option.

The departments of Communications and Homeland Security may be affected by the Natural Hazards option, because this option requires courses in both of these departments. We have discussed this option with Homeland Security and obtained their enthusiastic support and approval. We are in discussions with Communications. In general, any impacts due to increasing enrollments and space are expected to be minor, as we expect this option to appeal to a relatively small number of students (average of 2 per year) with specific career goals in mind.

F. IF MAJOR CHANGE - ASSESSMENT OF THE PROGRAM:

Description of the student learning outcomes assessment process.)

Besides the obvious enrollment data and student IAS surveys, current assessment tools employed by the Department of Geology & Geophysics include tracking graduates and developing an electronic survey that prompts recent graduates to reflect upon their experiences and preparation. Because the Geologic Hazards and Mitigation and the Secondary Education options are designed to prepare students for careers in government agencies and secondary teaching, respectively, tracking the employment of these graduates and gathering feedback from them regarding their competitiveness in the job market and level of preparation for employment will provide crucial information regarding the success of the program as designed here.

Currently, the program attracts only a couple of new majors annually. The revised program will not be considered successful unless it attracts *at least* 5 students per year. Whereas we realize that it may take a

few years for advertising and word of mouth to produce the numbers we want, 5 years is a reasonable trial period for the proposed options.

JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize program/degree change 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. If you drop a course, is it because the material is covered elsewhere? Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the program is not compromised as a result.

We have added 3 options to the Earth Science major in order to: 1) decrease the time to degree by reducing both the number of required credits and the number of required courses offer on an alternate year basis; 2) offer a greater variety of degree options; 3) clarify potential career paths for students in the degree program; 4) make it possible for students who wish to teach earth science in secondary school to complete their degree and obtain their teaching license in 4 years; and 5) increase program enrollments.

By providing multiple, clear paths to a B.A. degree in Earth Science, we hope to attract students who may be unsure of the professional applications of courses that appeal to them. We believe that this strategy will increase both enrollments and student success in the workforce

APPROVALS:

AS PER ATTACHED.

	Date	
Signature, Chair, Program/Department of:		

	Date	
Signature, Chair, College/School Curriculum Council for:		

	Date	
Signature, Dean, College/School of:		

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

	Date	
Signature, Chair, UAF Faculty Senate Curriculum Review Committee		

F. IF MAJOR CHANGE - ASSESSMENT OF THE PROGRAM:

Description of the student learning outcomes assessment process.)

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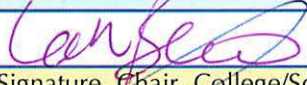
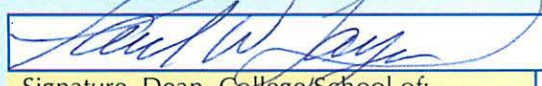
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APPROVALS:

	Date	9/20/12
Signature, Chair, Program/Department of: <u>Geology + Geophysics</u>		
	Date	10/3/2012
Signature, Chair, College/School Curriculum Council for: <u>CNSM</u>		
	Date	10/1/12
Signature, Dean, College/School of: <u>CNSM</u>		

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

	Date	
Signature, Chair, UAF Faculty Senate Curriculum Review Committee		