

PROPOSAL TO:

1. Change the name of the General Geology Option to Physical Geology
2. Drop the Environmental Geology, Hydrogeology, Resource Exploration, and Structural Geology and Tectonics Options
3. Create new Environmental Hydrogeology Option

Required course work includes the university requirements (see regulation J-3) and:

Code	Title	Hours
CHEM 111	Principles of Chemistry I	3
CHEM 111L	Principles of Chemistry I Laboratory	1
ENGL 317	Technical Writing	3
GEOG 385	GIS Primer	3
GEOL 102	Historical Geology	3
GEOL 102L	Historical Geology Lab	1
GEOL 249	Mineralogy and Optical Mineralogy	4
GEOL 290	Field Geology Methods	3
GEOL 324	Principles of Stratigraphy and Sedimentation	4
GEOL 326	Igneous and Metamorphic Petrology	4
GEOL 345	Structural Geology	4
GEOL 422	Principles of Geophysics	4
GEOL 423	Principles of Geochemistry	3
GEOL 490	Geology Field Camp	3

Select one of the following: 4

GEOL 101 & 101L	Physical Geology and Physical Geology Lab	
GEOL 111 & 111L	Physical Geology for Science Majors and Physical Geology for Science Majors Lab	

Select one of the following: 4

PHYS 111 & 111L	General Physics I and General Physics I Lab	
PHYS 211 & 211L	Engineering Physics I and Laboratory Physics I	

Options

 Select one of the following options: ~~18~~23-34

General Physical Geology	
Environmental Hydrogeology	
Hydrogeology	
Resource Exploration	
Environmental Geology	
Geological Education	
Structural Geology and Tectonics	

Total Hours ~~69~~74-85

Course List

 A. ~~General~~Physical Geology Option

Code	Title	Hours
GEOL 212	Principles of Paleontology	4
GEOL 335	Geomorphology	3
MATH 160	Survey of Calculus	4

Code	Title	Hours
or MATH 170	Analytic Geometry and Calculus I	
Select one of the following:		3-4
MATH 175	Analytic Geometry and Calculus II	
MATH 330	Linear Algebra	
STAT 251	Statistical Methods	
Advisor Approved Electives in Geology		9
Total Hours		23-24

Course List

Courses to total 120 credits for this degreeB. Environmental Hydrogeology Option

MATH 170	Analytic Geometry and Calculus I	4
MATH 175	Analytic Geometry and Calculus II	4
GEOL 309	Ground Water Hydrology	3
GEOL 410	Techniques of Groundwater Study	3

Select one of the following _____ 4

[PHYS 112 & 112L General Physics II and General Physics II Lab](#)

[PHYS 212 & 212L Engineering Physics II and Laboratory Physics II](#)

Select one of the following: _____ 3

[STAT 251 Statistical Methods](#)

[STAT 301 Probability and Statistics](#)

Select two electives from the following: _____ 6-8

[GEOL 335 Geomorphology](#)

[GEOL 428 Geostatistics](#)

[GEOL 344 Earthquakes and Seismic Hazards](#)

[GEOL 361 Geology and the Environment](#)

[GEOL 431 Chemical Hydrology](#)

[GEOG 301 Meteorology](#)

[GEOG 401 Climatology](#)

[HYDR 409 Quantitative Hydrogeology](#)

[HYDR 412 Environmental Hydrogeology](#)

[ENGR 360 Engineering Economy](#)

[MATH 275 Analytic Geometry and Calculus III](#)

[MATH 310 Ordinary Differential Equations](#)

[MATH 330 Linear Algebra](#)

[CHEM 112&112L Principles of Chemistry II and Lab](#)

[CHEM 275&276 Carbon Compounds and Lab](#)

[CHEM 277&278 Organic Chemistry I and Lab](#)

Total Hours 27-29

Courses to total 120 credits for this degree

B. Hydrogeology Option

Code	Title	Hours
GEOL 309	Ground Water Hydrology	3
or HYDR 409	Quantitative Hydrogeology	

Code	Title	Hours
GEOL 410	Techniques of Groundwater Study	3
MATH 170	Analytic Geometry and Calculus I	4
MATH 175	Analytic Geometry and Calculus II	4
STAT 251	Statistical Methods	3
or STAT 301	Probability and Statistics	
Select 6 credits of Hydrology electives from the following:		6
HYDR 409	Quantitative Hydrogeology	
HYDR 412	Environmental Hydrogeology	
HYDR 414	Ground Water-Surface Water Interactions	
HYDR 496	Hydrogeology Senior Thesis	
HYDR 576	Fundamentals of Modeling Hydrogeologic Systems	
Select 3 credits of Hydrogeology electives from the following if not used above:		3
BE 450	Environmental Hydrology	
CE 421	Engineering Hydrology	
ENGR 210	Engineering Statics	
HYDR 409	Quantitative Hydrogeology	
HYDR 412	Environmental Hydrogeology	
HYDR 414	Ground Water-Surface Water Interactions	
HYDR 496	Hydrogeology Senior Thesis	
HYDR 576	Fundamentals of Modeling Hydrogeologic Systems	
MATH 275	Analytic Geometry and Calculus III	
MATH 310	Ordinary Differential Equations	
SOIL 205	The Soil Ecosystem	
& SOIL 206	and The Soil Ecosystem Lab	
SOIL 415	Soil and Environmental Physics	
Total Hours		26

Course-List

Courses to total 120 credits for this degree

C. Resource Exploration Option

Code	Title	Hours
ECON 272	Foundations of Economic Analysis	4
GEOL 212	Principles of Paleontology	4
GEOL 407	Basin Analysis	3
MATH 160	Survey of Calculus	4
or MATH 170	Analytic Geometry and Calculus I	
STAT 251	Statistical Methods	3
or STAT 301	Probability and Statistics	
Advisor Approved Electives in Geology		6
Total Hours		24

Course-List

Courses to total 120 credits for this degree

D. Environmental Geology Option

Code	Title	Hours
GEOL 212	Principles of Paleontology	4
GEOL 335	Geomorphology	3
GEOL 309	Ground Water Hydrology	3
or HYDR 409	Quantitative Hydrogeology	
GEOL 344	Earthquakes and Seismic Hazards	3

Code	Title	Hours
or GEOL 361	Geology and the Environment	
MATH 160	Survey of Calculus	4
or MATH 170	Analytic Geometry and Calculus I	
Select one of the following:		3-4
MATH 175	Analytic Geometry and Calculus II	
MATH 330	Linear Algebra	
STAT 251	Statistical Methods	
Select Environmental Geology electives from the following:		9
BE 433	Bioremediation	
BE 452	Environmental Water Quality	
BIOL 115 & 115L	Cells & the Evolution of Life and Cells and the Evolution of Life Laboratory	
BIOL 250 & BIOL 255	General Microbiology and General Microbiology Lab	
CHEM 418	Environmental Chemistry	
GEOG 401	Climatology	
GEOL 410	Techniques of Groundwater Study	
SOIL 205 & SOIL 206	The Soil Ecosystem and The Soil Ecosystem Lab	
Select one of the following:		4
CHEM 275 & CHEM 276	Carbon Compounds and Carbon Compounds Lab	
CHEM 277 & CHEM 278	Organic Chemistry I and Organic Chemistry I: Lab	
Total Hours		33-34

Course List

Courses to total 120 credits for this degree**EC. Geological Education Option**

Code	Title	Hours
BIOL 115	Cells & the Evolution of Life	3
BIOL 115L	Cells and the Evolution of Life Laboratory	1
GEOG 100	Physical Geography	3
GEOG 100L	Physical Geography Lab	1
GEOG 401	Climatology	3
GEOL 212	Principles of Paleontology	4
GEOL 335	Geomorphology	3
MATH 160 or MATH 170	Survey of Calculus Analytic Geometry and Calculus I	4
PHYS 103	General Astronomy	3
PHYS 104	Astronomy Lab	1
PLSC 205	General Botany	4
Select one of the following:		3-4
MATH 175	Analytic Geometry and Calculus II	
MATH 330	Linear Algebra	
STAT 251	Statistical Methods	
Total Hours		33-34

Course List

Courses to total 120 credits for this degree

~~F. Structural Geology and Tectonics Option~~

Code	Title	Hours
GEOL 335	Geomorphology	3
GEOL 344	Earthquakes and Seismic Hazards	3
GEOL 432	Geologic Development of North America	3
GEOL 498	Senior Thesis	1-4
MATH 170	Analytic Geometry and Calculus-I	4
MATH 175	Analytic Geometry and Calculus-II	4
or MATH 330	Linear Algebra	
Total Hours		18-21

~~Course List~~~~Courses to total 120 credits for this degree~~

Rationale: The Geological Sciences faculty have had a lot of discussions about eliminating and streamlining our confusing degree options, which currently include General Geology, Hydrogeology, Resource Exploration, Environmental Geology, Geological Education, as well as Structural Geology and Tectonics. Based on enrollments since 2006, the faculty agreed to eliminate two options and combine the hydrogeology and environmental options into one. We are also proposing to rename the General Geology option to “Physical Geology” – mostly so it sounds more interesting, but also as a descriptor that distinguishes it from the other one. We have not made any other changes to that option. Thus we propose to have three options in the future: Physical Geology, Environmental Hydrogeology, and Geological Education.

The faculty have developed the proposed Environmental Hydrogeology option such that it combines the quantitative rigor of the old hydrogeology option with the flexibility of the old environmental option. We feel that it will offer our students good preparation for a career as well as a strong background if they choose to go on to graduate school.

After some consideration, we are proposing to keep the Geological Education option in spite of its relatively low enrollments. Hopefully, we can work with the Education faculty to revise and update this particular specialized track to meet the needs of Earth Science K1-12 teachers in the State.

This proposal does not require any new courses or any changes in faculty course loads. Per the UI's Strategic Plan for Student Affairs, the UI's overall vision is to inspire students to learn, lead, thrive, and positively impact their communities throughout their lives, more specifically to develop educational opportunities that enhance student involvement and a sense of purpose and belonging, and to address behaviors that impede student success. Through the development of the new revised Environmental Hydrogeology Option, this proposal does exactly these things by using existing resources to provide our students with a career opportunity to deal with issues that every community faces (water supply, landslides, ground failures, dam safety, flood control, environmental hazards, water quality, and resource development).

Enrollment is a major component of the UI strategic plan. Prospective students in Idaho, Washington and Oregon who want to combine the outdoors aspect of geology with the career prospects of environmental science and hydrology should find the revised Environmental Hydrogeology Option at the University of Idaho very attractive

PROGRAM COMPONENT (Group B) OR NON-SUBSTANTIVE MINOR REQUEST FORM (Short Form)

Instructions: Please use one form for each request/action. Clearly mark all changes using either (1) Track Change or (2) strikethroughs for deletions and underlines for additions. Yellow indicates a required field. Green are fields that are optional depending on the change you are requesting. Following the appropriate department and college approvals the department chair will e-mail the completed form to provost@uidaho.edu.

Deadline: This form must be submitted by **October 1** for inclusion in the next available General Catalog and to be available for scheduling beginning with the next summer session.

When applicable, a Curriculum Change Form and Course Approval Forms must accompany the short form. Incomplete forms will be returned.

Submission Information

Dept Chair Name:	Leslie Baker	Email:	lbaker@uidaho.edu
Department/Unit:	Geological Sciences		
College:	Science		
Dept/Unit Curriculum Committee Approval Date:	08/29/2018	Vote Record:	(9-0, one absent)
Dept Chair Signature of Approval	Leslie Baker		
College Curriculum Committee Approval Date:	09/27/2018	Vote Record:	Unanimous (7-0)
Dean Signature of Approval	Ginger Carney		
Primary Point of Contact:	Mark Nielsen	Email:	markn@uidaho.edu
Briefly describe the change you are requesting:	<p>In the B.S. Geological Sciences degree, it is requested to:</p> <ol style="list-style-type: none"> 1. Change the name of the General Geology Option to Physical Geology Option. 2. Combine the existing Environmental Geology and Hydrogeology Options into a single option called the Environmental Hydrogeology Option. 3. Drop the following Options: Resource Exploration, Structural Geology and Tectonics. <p>Note: officially, this amounts to dropping four of the six existing options, creating one new option (really a merging of two of those being dropped), and changing the name of one of the remaining options.</p>		

What is the financial impact of the requested change?

Greater than \$250,000 per FY:	<input checked="" type="checkbox"/>	Less than \$250,000 per FY:	<input type="checkbox"/>	**Note: If financial impact is greater than \$250,000, you must complete a Program Proposal form.
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Describe the financial impact: There will be no financial impact as there are no new courses or discontinued courses – merely a realignment of the options within the Geology major. It is hoped that enrollment in some courses may increase, but it should not exceed current capacity.

Rationale for Program Component Request or Name Change

Explain the change you are requesting, and provide a rationale for this request. Include an explanation of how the department will manage the added workload for a new program component; describe whether the program component curriculum and admissions requirements remain the same; describe the rationale for a name change or degree designation change, if applicable.

The Geological Sciences faculty have had a lot of discussions about eliminating and streamlining our confusing degree options, which currently include General Geology, Hydrogeology, Resource Exploration, Environmental Geology, Geological Education, and Structural Geology and Tectonics. Based on enrollments since 2006, the faculty agreed to eliminate two options and combine the hydrogeology and environmental options into one. We are also proposing to rename the General Geology option to “Physical Geology” as a descriptor that distinguishes it from the others. We have not made any other changes to the curriculum in that option.

The faculty have developed the proposed Environmental Hydrogeology option such that it combines the quantitative rigor of the old hydrogeology option with the flexibility of the old environmental option. We feel that it will offer our students good preparation for a career as well as a strong background if they choose to go on to graduate school.

After some consideration, we are proposing to keep the Geological Education option as it currently exists. Thus, the net effect will be a Geology major with three options: Physical Geology, Environmental Hydrogeology, and Geological Education.

This proposal does not require any new courses or any changes in faculty course loads. Per the UI's Strategic Plan, our vision is to inspire students to learn, lead, thrive, and positively impact their communities throughout their lives. More specifically, we seek to develop educational opportunities that enhance student involvement and a sense of purpose and belonging, and to address behaviors that impede student success. Through the development of the new revised Environmental Hydrogeology Option, this proposal does exactly these things by using existing resources to provide our students with a career opportunity to deal with issues that every community faces (water supply, landslides, ground failures, dam safety, flood control, environmental hazards, water quality, and resource development).

Enrollment is a major component of the UI strategic plan. Prospective students in Idaho, Washington and Oregon who want to combine the outdoors aspect of geology with the career prospects of environmental science and hydrology should find the revised Environmental Hydrogeology Option at the University of Idaho very attractive.

Name or Degree Change Only Requests

Leave blank if not making a name and/or degree change only request

This section to be completed **ONLY** for changes to the name of: degree, major, minor, option, emphasis, certificate, teaching endorsement.

Current Name:	
New Name:	
Current Degree:	
New Degree:	
Other Details:	
Effective Date:	

Please indicate if any course or curriculum changes are occurring as a result of this name or degree change request: Yes No

If there are accompanying curriculum or course changes, complete the next section and attach the curriculum and/or course forms.

****Note: A substantive change to a program degree, major, or program component may require a program proposal form.**

Please indicate whether 25% or more of the program learning outcomes are changing: Yes No

****Note: If you answered YES to this question, complete the table below:**

	List Old Learning Outcomes	New Learning Outcome, if changed <i>(if no change, write N/A and move to next outcome)</i>	New Direct Measure <i>(list student work product and explain how it will be evaluated)</i>	Have you updated the assessment cycle to include this change? (yes/no)
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SLO#1			
SLO#2			
SLO#3			
SLO#4			
SLO#5			

Program Component Request

Leave blank if not adding, discontinuing, or modifying a program component. Program components consist of option, emphasis, minor, academic certificate less than 30 credits, or teaching endorsement

Clearly mark all changes to existing program components by using either (1) Track Change or (2) strikethroughs for deletions and underlines for additions. A curriculum change form and/or course approval forms associated with this request are required to be submitted with this short form.

X	Create New	X	Discontinue	Implementation Date:	Summer 2019		
	Graduate Level	X	Undergraduate Level	Law Level	Credit Requirement:	120	
Are new courses being created: (circle your response)				No X	Yes	If yes, how many courses will be created:	

If the request is for an option or emphasis, enter the associated major and degree:

Major:	Geology	CIP Code:	40.0605 Hydrology and Water Resources Science Code for Physical Geology option will remain 40.0601	Degree:	BS
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Enter the name of the program component in the appropriate row:

Option:	<p>Discontinue these options:</p> <ul style="list-style-type: none"> • Environmental Geology option, • Hydrogeology option, • Resource Exploration option • Structural Geology and Tectonics option <p>Create new option:</p> <ul style="list-style-type: none"> • Environmental Hydrogeology
Emphasis:	
Minor:	
Academic Certificate less than 30 credits:	
Teaching Endorsement (Major/Minor):	

Provide a summary/description of the program component using 50 words or less:

Based on analysis of job opportunities pursued by students in the current Hydrogeology and Environmental Geology option, the new Environmental Hydrogeology option merges these curricula into a single option that will better serve students interested in these areas.

Learning Outcomes and Assessment Information

This section must be completed if program component request section is completed

- List the intended learning outcomes for the program component. Use learner centered statements that indicate what will students know, be able to do, and value or appreciate as a result of completing the program:

The new Environmental Hydrogeology option's learning outcome goals are those of the B.S. Geological Sciences degree.

1. Graduates receiving a B.S. in Geological Sciences will demonstrate fundamental content knowledge about geologic time, Earth materials and structure, and Earth systems and processes.
2. Graduates receiving a B.S. in Geological Sciences will be proficient in discipline-specific skills including field methods, laboratory methods, mapping and geospatial analysis, experimentation and data analysis, application of principles from other fields to the solution of geological problems, and specific technical skills appropriate to their intended careers.
3. Graduates receiving a B.S. in Geological Sciences will solve geologic problems using their skills in spatial reasoning, temporal reasoning, systematic thinking, and data collection and analysis.
4. Graduates receiving a B.S. in Geological Sciences will be able to design and carry out a project, collaborate with others, and communicate their work and their results to varying audiences.

2. Describe the assessment process that will be used to evaluate how well students are achieving the intended learning outcomes of the program component:

The faculty have developed a skills matrix to ensure that all needed skills are being taught and assessed at appropriate levels on students' path to their degrees. This matrix is based on national best practices in geological education and on American Geosciences Institute workforce survey data on important competencies for geoscience graduates.

https://serc.carleton.edu/NAGTWorkshops/departments/degree_programs/matrix.html

<https://www.americangeosciences.org/workforce/data>

<https://www.americangeosciences.org/workforce/currents/critical-skills-necessary-development-undergraduate-geoscience-students>

The faculty will annually assess overall student outcomes compared to the skills matrix and make adjustments to courses as necessary. The faculty will also assess the overall skills matrix as new workforce data become available, to ensure graduates continue to be prepared for their intended careers.

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3. How will you ensure that the assessment findings will be used to improve the program?

Findings from direct and indirect measures will lead to suggested changes in the courses, which will be implemented when the courses are next offered.

4. What direct and indirect measures will be used to assess student learning?

The learning outcome goals are directly assessed using student work products including exams, laboratory reports, maps, projects, written papers, and oral presentations in required upper-level geology classes.

Indirect assessments of learning outcomes include student scores on the ASBOG Fundamentals of Geology examination, for those students who choose to take this professional certification exam. Further indirect assessment includes tracking of student career paths upon graduation: are they finding positions that use their skills and are appropriate to their level of training?

5. When will assessment activities occur and at what frequency?

The courses used for assessment are offered yearly. These include GEOL 324 Sedimentology and Stratigraphy, GEOL 326 Igneous and Metamorphic Petrology, GEOL 345 Structural Geology, GEOL 422 Principles of Geophysics, and GEOL 490, Field Geology II (our capstone course). Assessment of students in each individual course will occur as they take it. This needs to be done individually because although some students move through as cohorts, not all students take exactly the same course sequence. An overall faculty assessment of student outcomes based on the skills matrix and of the additional indirect measures will also be conducted yearly.

Distance Education Availability

This section must be completed if program component request section is completed

To comply with the requirements of the Idaho State Board of Education (SBOE) and the Northwest Commission on Colleges and Universities (NWCCU), the University of Idaho must declare whether 50% or more of the curricular requirements of a program may be completed via distance education. **If the program component is to be offered via distance education, additional or different formwork may be required.** Contact provost@uidaho.edu for assistance.

The U.S. Department of Education defines distance education as follows:

Distance education means education that uses one or more of the technologies listed below to deliver instruction to students who are separated from the instructor and to support regular and substantive interaction between the students and the instructor, either synchronously or asynchronously. The technologies may include--

- (1) The internet;
- (2) One-way and two-way transmissions through open broadcast, closed circuit, cable, microwave, broadband lines, fiber optics, satellite, or wireless communications devices;
- (3) Audio conferencing; or
- (4) Video cassettes, DVDs, and CD-ROMs, if the cassettes, DVDs, or CD-ROMs are used in a course in conjunction with any of the technologies listed in paragraphs (1) through (3).

Can 50% or more of the curricular requirements of this program component be completed via distance education?	Yes*	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
*If Yes, can 100% of the curricular requirements of this program component be completed via distance education?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

Geographical Area Availability

This section must be completed if program component request section is completed

Identify the geographical area(s) this program component can be completed in:

Moscow	<input checked="" type="checkbox"/>		
Coeur d'Alene	<input type="checkbox"/>		
Boise*	<input type="checkbox"/>		
Idaho Falls*	<input type="checkbox"/>		
Other**	<input type="checkbox"/>	Location(s):	

*Note: Programs offered in locations other than Moscow may require additional formwork from the State Board of Education. Contact the Office of the Provost and Executive Vice President for additional information.

**Note: If Other is selected, identify the specific area(s) this program component will be offered.