

Board of Regents Program Action Request  
University of Alaska  
Proposal to Add or Change a Program of Study

1a. UA University UAF	1b. School or College College of Engineering & Mines	1c. Department or Program Geological Engineering MS
2. Complete Program Title:		Geological Engineering MS
3. Type of Program:		
Undergraduate Certificate	<input type="checkbox"/>	Associate
Master's	<input checked="" type="checkbox"/>	Doctorate
	<input type="checkbox"/>	Baccalaureate
	<input type="checkbox"/>	Post-Baccalaureate Certificate
4. Type of Action:		
	<input type="checkbox"/>	Add
	<input checked="" type="checkbox"/>	Change
Implementation Semester:		Year:
	Fall	2021
6. Projected Revenue and Expenditure Summary:		
NOTE: GF revenue and annual expenditures for MS program is reflected on GE BS Program Action Request form.		
Provide information for the 5 <sup>th</sup> year after program change approval if a baccalaureate or doctoral degree program; for the 3 <sup>rd</sup> year after program approval if a master's or associate degree program; or for the 2 <sup>nd</sup> year after program approval if a graduate or undergraduate certificate. If information is provided for another year, specify () and explain in the program summary attached. Note that revenues and expenditures are not always entirely new; some may be current (see 7d.)		
Projected Annual Revenues in FY25 (Combined BS & MS)		Projected Annual Expenditures in FY25 (Combined BS & MS)
Unrestricted		Salaries & benefits (faculty and staff)
General Fund	\$ 260,000.00	
Student Tuition & Fees	\$ 80,000.00	Other (commodities, services, etc.)
Indirect Cost Recovery	\$ -	
TVEP or Other (specify):	\$ -	TOTAL EXPENDITURES:
Restricted		
Federal Receipts	\$ -	One-time Expenditures to Initiate Program (if >\$250,000)
TVEP or Other (specify):	\$ -	(These are costs in addition to the annual costs, above.)
TOTAL REVENUES	\$ 340,000.00	Year 1
		Year 2
		Year 3
		Year 4
Page # of attached summary where the budget is discussed, including initial phase-in:		N/A
7. Budget Status. Items a., b., and c. indicate the source(s) of the general fund revenue specified in item 6. If any grants or contracts will supply revenue needed by the program indicate amount anticipated and expiration date, if applicable.		
Revenue source	Continuing	
a. In current legislative budget request	\$ -	\$ -
b. Additional appropriation required	\$ -	\$ -
c. Funded through new internal UA university redistribution	\$ -	\$ -
<a href="#">d. Funds currently committed to the program[1]</a>	\$ -	\$ -
e. Funded all or in part by external funds, expiration date	\$ -	\$ -
f. Other funding source (specify type):	\$ -	\$ -
	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

9. Projected Enrollments (headcount of majors). If this is a program discontinuation request, project the teach-out enrollments.

Year 1: 3

Year 2: 3

Year 3: 3

Year 4: 3

N/A

0

0

0

2 (Eliminated)

MinGeo

X

X

Yes

No X

Submitted by:

Consensus support of AC

Not supported by AC

<sup>2</sup>Net FTE (full-time equivalents). For example, if a faculty member will be reassigned from another program, but his/her original program will hire a replacement, there is one net new faculty member. Use fractions if appropriate. Graduate TAs are normally 0.5 FTE. The numbers should be consistent with the revenue/expenditure information provided.

Attachments:

Summary of Degree or Certificate Program Proposal

Other (optional)

Revised: 11/11/2019

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March 23, 2020

TO

## UAF Expedited Program Review

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edges of our mission, and reducing footprint. And we will continue to identify what work we can simply stop doing.

I concur with

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except in the following where I have recommended a different path:

1. Atmospheric science delete with opportunities for students in existing departments in similar areas (e.g., physics, chemistry, engineering) including possible alternative appointments at UAF for research intensive faculty
2. BA Earth Science delete
- 3.

## COMMITTEE RECOMMENDATION FOR GEOLOGICAL ENGINEERING

### STRENGTHS:

The Geological Engineering (GE) program has been ranked among the top 10 in the nation on several occasions it is an ABET accredited program.

*NOT* duplicated in the UA system.

Program is critical to resource development in Alaska.

High level of faculty research productivity, with success in attracting external funding.

There is strong donor & industry support and robust community engagement.

The program contributes to providing a highly skilled workforce in high demand resource extraction areas, consulting, and for state and federal agencies.

### WEAKNESSES:

It is a challenge to deliver ~50 credits to undergrads and grads: there is little margin of error in planning timelines of course offerings.

GE Program is at a critical mass due to retirements, sabbaticals, attrition. It is extremely difficult to teach all required courses with existing faculty.

Funding for modernizing equipment for lab spaces needed; other limiting factors Budget cuts.

Low enrollments and graduation numbers.

### OPPORTUNITIES:

Alaska is a resource rich state critical nature of the Mining and Geological Engineering Department and the value it brings to the University and the State can be leveraged to increase revenue and stakeholder involvement.

The mining sector in Alaska is an untapped market GE graduates are needed in this and other related fields.

The industry has not seriously engaged UAF in many of its problems. Therefore, these problems in the mining sector also represent an untapped market and potential revenue streams.

Alaska Miners Association (in the Appendix) states that "mining and geological engineers" are a priority occupation because of difficulty in recruiting them.

US Bureau of Labor Statistics, jobs for Mining and Geological Engineers are expected to increase by 6% through 2024.

### THREATS:

Faculty attrition has led to loss of capacity and stability that impact accreditation. Loss of accreditation imperils program.

Relative low number of students compared to other CEM programs

Budget cuts with more to come.

### CENTRALITY TO MISSION:

Central to UAF Mission: *"The mission of the only Geological Engineering program in Alaska, is to advance and disseminate knowledge related to mineral and energy*

*exploration, evaluation, development and production; engineering site selection, construction and construction material production; and groundwater and geo environmental engineering including geologic hazards assessment, through creative teaching, research and public service with an emphasis on Alaska, the North and its diverse peoples."*

The department serves Alaska workforce development needs for resource extraction. Addresses UAF Core Themes Educate and Engage.

**INDICATORS OF QUALITY:**

- High level of faculty research productivity.
- GE undergraduate students won the first place in AEG annual meeting poster contest in 2017 and third place in 2019.
- Graduates of the program typically join the resource industry, engineering consulting companies, or state or federal agencies.
- Department organized the prestigious 2015 APCOM International Conference in Fairbanks.

**COST EFFECTIVENESS:**

Salaries and Benefits total for ME & GE~ \$1.33M, which is a high cost per student.

	MAJORS	DEGREES
Geological Engineering BS	FY15: 45/ FY19: 43	FY15: 7/ FY19: 7
Geological Engineering MS	FY15: 4/ FY19: 4	FY15: 1/ FY19: 2

**COMMITTEE RECOMMENDATION FOR GEOLOGICAL ENGINEERING**

**Geological Engineering BS:**

RECOMMENDATION:	ADDITIONAL COMMENTS:	DATE FOR FOLLOW UP:
Revision or restructure (8 votes)	create concentration in Geological Engineering within the Civil Engineering BS & at that point eliminate Geological Engineering BS	One year

**Geological Engineering MS:**

RECOMMENDATION:	ADDITIONAL COMMENTS:	DATE FOR FOLLOW UP:
Deletion (8 votes)	fold emphasis into Civil Engineering graduate program	

## **Summary of initial plan to restructure Geological Engineering BS and MS programs and migrate them into a single department shared with the Civil and Environmental Engineering programs**

Note: Due to the intertwined relationship between the Geological Engineering BS and MS programs, calculations on the PAR forms (e.g. revenues and expenditures, faculty FTE, etc) refer to the combined programs. The Geological Engineering BS and MS programs together currently host four faculty members. The restructure will garner cost savings by retaining only two of the current GE faculty members, and delivering the remainder of the curriculum through resources shared with other CEM programs.

Geological Engineering (GE) is interdisciplinary by nature, integrating mathematics, physics, chemistry, geology, hydrology, and engineering science to: 1) recognize and mitigate anthropomorphic and natural hazards, 2) design and construct embankments and earthen structures, 3) manage and remediate groundwater resources, and 4) locate and harvest associated with mining engineering (MIN), geology (GEOS), and civil engineering (CE) programs, depending on the university. While having been in the Department of Mining and Geological Engineering since its inception at UAF, the GE program also can have a logical home within the Department of Civil and Environmental Engineering for the following reasons:

Developing



organize, analyze, and present that data. While courses exist in both programs on instrumentation and GIS analysis, combining GE and CE into one department offers the opportunity to revitalize these courses and others addressing the growing need for addressing big data in engineering.

Increasing synergy between the GE and CE programs. Sharing the expertise of faculty members between these two programs will increase the synergy and student opportunities. Currently, GE students take several CE classes as technical electives (e.g., CE341, CE344, CE498), and vice versa (e.g., GE440, GE441). Additionally, GE and CE faculty co-teach one graduate-level course (GE/CE626). Migrating the GE program into the CE department will facilitate CE students to take more GE courses as technical electives and vice versa through greater advertisement of the course offerings and potential co-teaching opportunities.

Maintaining the ability to address the needs of the Mineral Resources community. Graduates of the GE program will still be able to work in the mining industry, regardless of where the program resides. Depending on their interests, the GE students can take GEOS 332 Ore Deposits and Structure as a technical elective and complete a Mining minor to focus on mineral-related engineering problems and design.

One concern: to remain an ABET-accredited program, GE must include geophysics. As part of the ABET criteria, graduates from the GE program must be able to apply elements of geophysics to engineering problems. Thus, regardless of where GE resides, the program must retain a faculty member with the needed expertise to teach geophysics. Those geophysics-related courses could be offered to other departments, as required.