

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	Mining and Geological Engineering	College/School	CEM
Prepared by	Debasmita Misra	Phone	907.474.5339
Email Contact	debu.misra@alaska.edu	Faculty Contact	Debasmita Misra

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

2. COURSE IDENTIFICATION: Dept **GE** Course # **445** No. of Credits **3**

Justify upper/lower division status & number of credits:

3. PROPOSED COURSE TITLE: **Design of Earth Dams and Embankments**

4. To be CROSS LISTED? YES/NO No If yes, Dept: Course #
 (Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)

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

6. FREQUENCY OF OFFERING: **As Demand Warrants**
 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) **Spring 2013**

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 6 weeks to full semester

OTHER FORMAT (specify)
 Mode of delivery (specify lecture, field trips, labs, etc)

9. CONTACT HOURS PER WEEK: 3 LECTURE hours/weeks 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)

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

GE F445 Design of Earth Dams and Embankments

3 Credits

Offered in Spring As Demand Warrants

Preliminary planning for design and construction of earth dams, site selection, reservoir assessment, foundation and other building materials, procedure for design of earth dams, design of abutment and spillway, estimation of volume of earthworks and storage capacities, site preparation for construction, excavation, slope stability issues and other geological engineering assessments. Prerequisites: GE F420 or permission of instructor. (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?	<input type="checkbox"/>	TIMES
If the course can be repeated for credit, what is the maximum number of credit hours that may be earned for this course?	<input type="checkbox"/>	CREDITS
If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course?	<input type="checkbox"/>	CREDITS

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** GE F420 or Permission of Instructor

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

15. **SPECIAL RESTRICTIONS, CONDITIONS** None

16. **PROPOSED COURSE FEES** \$0.00

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

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

18. ESTIMATED IMPACT

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

None.

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

I will contact library shortly to procure copies of the textbook and some reference materials.

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).

The Geological Engineering program is the only program that will be enriched due to the offering of this technical elective. There is no other course that is equivalent to this course at an undergraduate level.

21. POSITIVE AND NEGATIVE IMPACTS

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

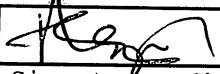
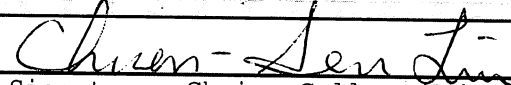
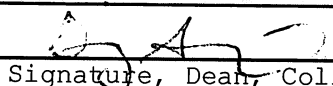
A positive impact might be that undergraduate students of Civil Engineering program may be interested in taking this course as a technical elective.

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.

Our graduating students have often stated during their exit interview about the limited number of design classes they had as choice to take. This course is being introduced due to popular demand from our undergraduate students who would like to learn a complete design of earth dams and embankments that integrate knowledge they procure from other classes such as GE 365, GE 375, GE 420 and GE 440 at the minimum.

APPROVALS: Add additional signature lines as needed.

	Date	12/21/11
Signature, Chair, Program/Department of: Mining & Geological Eng		
	Date	01/09/201
Signature, Chair, College/School Curriculum Council for:		
	Date	2/24/12
Signature, Dean, College/School of: CEM		
	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:		

**Department of Mining and Geological Engineering
Geological Engineering Program**

**GE 445; 3 Credits
(Technical Elective)**

**Design of Earth Dams and
Embankments**

Spring 2013

Catalog Description: Preliminary planning for design and construction of earth dams, site selection, reservoir assessment, foundation and other building materials, procedure for design of earth dams, design of embankment and spillway, estimation of volume of earthworks and storage capacities, site preparation for construction, excavation, slope stability issues and other geological engineering assessments.
Prerequisites: GE F420 or permission of instructor. (3+0)

Required Textbook:

Advanced Dam Engineering for Design, Construction and Rehabilitation,
(Editor) Robert B. Jansen, 1988, Van Nostrand Reinhold, NY. (ISBN: 0-442-24397-9)

Other Recommended Study:

Design of Earth Dams, A.L. Goldin and L.N. Rasskazov, 1992, A.A. Balkema, Brookfield, VT (ISBN: 90-6191-173-7)

Design and Construction of Small Earth Dams, K.D.Nelson, 1985, Inkata Press, Melbourne, Australia (ISBN: 909605-34-5)

Geological Engineering, Luis I. Gonzalez de Vallejo and Mercedes Ferrer, 2011, Chapters 11 and 12, CRC Press (ISBN-13: 978-0-415-41352-7)

Geotechnical Engineering of Dams, David Stapledon, Patrick MacGregor, Graeme Bell and Robin Fell, Taylor & Francis 2005 (ISBN: 978-0-415-36440-9)

Class Handouts as necessary.

Course Objectives: The objective of the course is to educate students on applying their knowledge acquired from Materials Engineering, Rock Mechanics, Terrain Analysis, Exploration Geophysics, Subsurface Hydrology and Geology courses to successfully design earth dams and foundations.

Learning Objectives: (Students are expected to achieve the following)

1. Investigate and plan a dam site for construction
2. Design an earth dam, foundation, spillways and reservoir.
3. Assess engineering issues related to stability of the dam.

Schedule:

Lecture: TBD

Instructor: Debasmitta Misra (Office: 307 DUCK), 907.474.5339, debu.misra@alaska.edu

Office Hours: As posted or by appointment

LECTURES

(NOTE: Handouts will be selected from the reference texts listed under other recommended study)

<i>Week</i>	<i>Lecture (Reading Assignment)</i>	<i>Homework Assignment</i>
1	Introduction, Types of Dams and Auxiliary Structures Lessons from Notable Events (Chapter 2)	No Homework
2	Geotechnical questions associated with various geological environments (Chapter 4 + Handouts) Planning, conducting and reporting of geotechnical investigations (Handouts)	Homework 1: Dam site selection and geotechnical investigation
3	Site investigation techniques (Handouts) Shear strength, compressibility and permeability of embankment materials and soil foundations (Chapter 6)	Homework 2: Materials investigation from geologic and geotechnical perspective
4	Shear strength, compressibility and permeability of embankment materials and soil foundations (Chapter 6)	No Homework
5	Engineering Geological criteria for dam selection (Chapter 9 + Handouts)	Homework 4: Selection of Dam for a site under investigation
6	Hydrology, Open Channel flow and Reservoir Water Tightness (Chapter 3 + Handouts)	Homework 5: Estimation of Precipitation, Runoff and reservoir storage
7	Design, specification and construction of filters (Handouts) Cofferdams (Chapter 7)	No Homework
8	<i>Review for Midterm Exam</i> <i>MID TERM EXAM</i>	
9	Earthfill Dam Design and Analysis (Chapter 9)	Homework 6: Reservoir Sedimentation
10	Control of seepage, internal erosion and piping for embankment dams (Chapter 10 and 11)	Homework 7: Engineering analysis on seepage through earth dams and piping
11	Reservoir Slope Stability (Chapter 11 + Handouts)	Homework 8: Slope stability analysis
12	Spillway Design and Construction (Chapter 20)	No Homework
13	Spillway Performance and Remedial Measures (Chapter 21)	Homework 9: Spillway analysis
14	Introduction to Rockfill Dam Design and Analysis (Chapter 12) <i>Review for Final Exam</i>	No Homework
15	<i>FINAL EXAM</i>	

FINAL TERM PAPER:

The final term paper will be a comprehensive design report on information that has been collated or estimated through the homework assignments.

My assessment of this part will include the following –

1. Your professional presentation of the problem.
2. Depth of research you have done to provide the recommendation.
3. Your understanding of the key components and parameters of the system or the processes.
4. How well you recognize geological engineering-related issues using desk-top analytical approach.
5. How well you have designed a plan to solve the engineering problem.
6. How well you provide a solution to the engineering problem.

COURSE POLICIES:

- Students are expected to read the material assigned each week prior to attending the lecture.
- If you need more information on the course syllabus and progress, please discuss with the instructor within the first two weeks of lecture.
- If you missed a class, it is your responsibility to update yourself with what was covered in that class.
- Extra Class may be offered as needed. Such classes will be offered in consultation with all students.
- **All Homework assignments should be submitted electronically ONLY.** Other homework assignments may be added to those assigned in the schedule, as needed.
- Late submission of deliverables will not be accepted unless the student was sick and can produce proof of sickness, had loss of immediate family members, or was traveling on university business (e.g., athletes, professional presentations in conferences, etc.).
- Cell phones should be placed in VIBRATION mode while in class. No messaging or texting is allowed during class hour.
- The instructor reserves the right to modify or add to the schedule with minimal discomfort to the students.
- The instructor may need to travel on business and the class will be informed of such arrangements as soon as possible.
- Students are expected to be ethical in conduct, professional in demeanor and expected to adhere to the University of Alaska Honor Code. You may find the honor code at the following URL address:
http://www.uaf.edu/catalog/catalog_01-02/undergrad/regs3.html

GRADING:

Grading will be based on the cumulative performance over the semester. The weighting scheme of each assignment will be as follows:

▪ Homework	20%
▪ Midterm Exam	20%
▪ Final Term Paper	30%
▪ Final Exam	30%

An absolute grading policy will be followed for your final grades: 95% < A+ ≤ 100%; 90% < A ≤ 95%; 85% < A- ≤ 90%; 80% < B+ ≤ 85%; 75% < B ≤ 80%; 70% < B- ≤ 75%; 65% < C+ ≤ 70%; 60% < C ≤ 65%; 55% < C- ≤ 60%; 50% < D < 55%; F < 50%

BLACKBOARD INFORMATION:

1. The UAF Blackboard (Bb) will be used to distribute materials for this course, as needed.
2. The Bb can be accessed by <http://classes.uaf.edu/>.
3. You need your Usermin (MyUA) userid and password to access Bb.
4. If you do not have a Usermin account, then please get it IMMEDIATELY by contacting UAF Help Desk at (907) 450-8300.
5. Bb will be my means to communicate with you all after class hours for any information about the course.
6. It is your responsibility to check the “ANNOUNCEMENT” section of the Bb on a regular basis. I will also be communicating with you via group emails from the Bb.
7. Please FAMILIARIZE yourself with the Bb as soon as possible. The most important aspects that you need on a daily basis, besides the ANNOUNCEMENT section is the COURSE DOCUMENTS section.

STUDENT SUPPORT SERVICES:

CEM computer technicians are located in the Duckering building room 248 (contact phone: 474-5216). They can help with issues related to software and hardware problems in the computer lab (310 and 318 Duckering). Blackboard support is available through UAF OIT helpdesk. The instructor is available for any other support required during the offering of this course. Ms. Judy Johnson, Office Manager of Mining and Geological Engineering Department is available for departmental support in Room 301 Duckering (474-7338).

DISABILITIES SERVICES:

The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. The instructor and the office manager of Mining and Geological Engineering program will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide reasonable accommodation to students with disabilities.

Contribution to Professional Component: The students are exposed to real world design issues and they utilize principles of engineering, mathematics, soil and fluid mechanics, physics, numerical methods and computer techniques to design and analyze practical problems.

Course Outcomes for ABET: This course is arranged towards meeting the educational outcomes set forth by the Department of Mining and Geological Engineering.

Outcomes	Role of GE 445
(c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	The lectures and assignments will distinctly target the ability of the student to design an entire system or a component with realistic constraints.
(e) An ability to identify, formulate, and solve engineering problems.	The lectures and homework components of the course will provide ample opportunity to identify issues and include those in the design of earth dams.