**TRIAL COURSE OR NEW COURSE PROPOSAL**

**SUBMITTED BY:**
- Department: CEE
- Prepared by: Yuri Shur
- Email Contact: ffys@uaf.edu
- Phone: 474-7067

**College/School** | **CEM**
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|  | Yuri Shur

See [http://www.uaf.edu/uafgov/faculty/cd/cdman.html](http://www.uaf.edu/uafgov/faculty/cd/cdman.html) for a complete description of the rules governing curriculum & course changes.

1. **ACTION DESIRED** (check one):
   - Trial Course
   - New Course [X]

2. **COURSE IDENTIFICATION**:
   - Dept: CEE
   - Course #: CE 424
   - No. of Credits: 3

   Justify upper/lower division status & number of credits:

3. **PROPOSED COURSE TITLE**:
   - Introduction to Permafrost Engineering

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

   (Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)

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

6. **FREQUENCY OF OFFERING**:
   - Alternate Spring
   - (Every or Alternate) Fall, Spring, Summer — or As Demand Warrants

7. **SEMESTER & YEAR OF FIRST OFFERING (if approved)**
   - Spring 2007

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 one]
     - 1 2 3 4 5 6 weeks to full semester
   - OTHER FORMAT (specify)

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

9. **CONTACT HOURS PER WEEK**:
   - 3 LECTURE hours/weeks
   - LAB hours/week
   - PRACTICUM hours/week

   Note: # of credits are based on contact hours. 600 minutes of lecture=1 credit. 2400-4800 minutes of internship=1 credit. 2400-8000 minutes of internship=1 credit. This must match with the syllabus. See [http://www.uaf.edu/uafgov/faculty/cd/credits.html](http://www.uaf.edu/uafgov/faculty/cd/credits.html) for more information on number of credits.

**OTHER HOURS (specify type)**
- Two field trips 3 hours each
10. COMPLETE CATALOG DESCRIPTION including dept., number, title and credits (50 words or less, if possible):

Introduction to permafrost and frozen ground engineering, types of permafrost and ways of its formations, factors important for permafrost existence, hazards related to permafrost, index, thermal, and mechanical properties of frozen and thawing soils, methods of thermal analysis of soil freezing and thawing, foundations design alternatives, pipelines, roads and airfields in the permafrost region (Prerequisites: CE 326 or permission of instructor. (3+0). Offered Alternate Spring

11. COURSE CLASSIFICATIONS: (Undergraduate courses only. Use approved criteria found on page 10 x 17 of the manual. If justification is needed, attach on separate sheet.)

| X = Humanities | N = Natural Science | S = Social Sciences |

Will this course be used to fulfill a requirement for the baccalaureate core?  YES X NO

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

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

12. COURSE REPEATABILITY:

Is this course repeatable for credit? YES X 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

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

13. GRADING SYSTEM:

LETTER: X  PASS/FAIL: 

14. PREREQUISITES

Introduction of Geotechnical Engineering or instructor permission

RECOMMENDED

CE 422 Foundation Engineering, GE 384 Engineering geology of Alaska

Classes, etc., that student is strongly encouraged to complete prior to this course.

15. SPECIAL RESTRICTIONS,

CONDITIONS

16. PROPOSED COURSE FEES

$NA

Has a memo been submitted through your dean to the Provost & VCAS 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.: Spring 2007, CE-493-001 Introduction to Permafrost Engineering
10. 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 (ffklj@uaf.edu, 474-6685) 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 [x] Yes [ ] Rasmussen Library has sufficient sources

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)

none

21. POSITIVE AND NEGATIVE IMPACTS
Please specify positive and negative impacts on other courses, programs and departments resulting from the proposed action.

This course will meet the CEE Department objection to better teach students to northern issues

JUSTIFICATION FOR ACTION REQUESTED
The purpose of the department and campus-wide curriculum committees is to scrutinize course changes and new course applications to make sure that the quality of our 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.

Knowledge of northern issues is a part of CEE's ABET objections and outcomes. Most of CEE BS students work after graduation in design and construction in Alaska and should solve engineering problems related to permafrost. There is no other course in the contemporary CEE curriculum which teaches how to do it.

The objectives of this course are to provide students with a thorough understanding of permafrost properties, permafrost related hazards, and permafrost engineering design and construction. They are expected to understand and be able to solve problems in following areas: site and route studies in the permafrost region, thermal analysis permafrost related hazards, design alternatives for buildings, pipelines, roads and airfields.

APPROVALS:

Signature, Chair, Date 10/31/07
Program/Department of:

Date 10/31/07
Signature, Chair, College/School Curriculum Council for:

Date 10/31/07
Signature, Dean, College/School of: College of Engineering & Mines

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

Signature, Chair, UAF Faculty Senate Curriculum Review Committee

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Department of Civil And Environmental Engineering

CE-424 Introduction To Permafrost Engineering

3 credits elective class.

Instructors: Dr. Yuri Shur 237, Duckering, ffys@uaf.edu

Lectures: Tuesday and Thursday 3:40-5:10 PM at Duckering 406

Lab - TBA

Texts: Instructors’ notes.

Prerequisites: CE 326 Introduction to geotechnical Engineering
Recommended: CE 422 Foundation Engineering

Course objectives:
The objectives of this course are to provide students with a thorough understanding of permafrost properties, permafrost related hazards, and permafrost engineering design and construction. You are expected to understand and be able to solve problems in following areas:

- Frozen ground
- Permafrost
- Active layer
- Types of permafrost, permafrost distribution
- Permafrost origin
- Terrain characteristics
- Ground ice
- Site and route studies
- Thermal analysis
- Permafrost related hazards
- Thermal and mechanical properties of frozen and thawing soils
- Foundations
- Pipelines
- Roads and airfields

ABET Criteria 3 – Program outcomes
This course helps students meet outcomes:
(a) an ability to apply knowledge of mathematics, science, and engineering
(e) an ability to identify, formulate, and solve engineering problems
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a
global and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for
   engineering practice.
(l) an appreciation of significant engineering issues in the North

Format of the class:
I. Work with instructor:
   1. Lectures 80%
   2. Problems solving and quizzes 10%
   3. Fieldwork in the permafrost tunnel and field sampling of frozen soil 10%
II. Home assignments
   1. Homeworks. They are due in the beginning of class on date stated unless
      permission given ahead of deadline to do otherwise.
   2. A project individually or in a group of 2. Topic of the project will be chosen in the
      beginning of February. Dr. Daniel Fortier and Dr. Mikhail Kanevskiy will help
      you in the literature search and you can discuss with them and me your founding.
      You will present a report and a Power Point presentation to the class.

Class participation:
Class attendance on is strongly recommended. Work in the field is mandatory. I expect
your active participation in the class. During lectures you will be asked numerous
questions and we will solve problems. Do not be afraid of wrong answers to my
questions when we discuss a new topic. Your active participation is more important than
the correct answer to a specific question. Ask questions at any time. Be ready for
problem solving activities and quizzes at the class and always bring a calculator.

Quizzes and Exams
Quizzes will be frequently given in class to check your understanding of the studied
material. Two exams (midterm and a final) will be given during the semester. Exams
will consist of questions to answer and problems, which have to be solved. Each will be
designed to test your understanding of critical concepts and your ability to solve
problems. Typically, the exams will consist of a closed book/closed note portion of fill in
the blank/multiple choice/short essay questions followed by an open book portion
consisting of problems that must be solved.

GRADING POLICY
Homework 20%. Work in class, notes keeping and quizzes 10%. Work in the field 10%.
Midterm exam 30%, Final 30%

Your grade will be assessed as:
A+  =  97% and above
A    =  93to 97%
A- = 89 to 92%
B+ = 85 to 88%
B = 82 to 84
B- = 80 to 82%
C+ = 77 to 79
C = 74 to 76
C- = 70 to 73
D+ = 65 to 69%
D = 60 to 64
D- = 55 to 60%
F = Below 55%.

Policies
The UAF Student Code of Conduct requires students to conduct themselves honestly and responsibly. Cheating, plagiarism, or other forms academic dishonesty is prohibited. Only those materials permitted by instructor may be used to assist in quizzes and examinations.

*Students with physical or learning disability are invited to contact Health Center Disabilities Coordinator in the beginning of the semester.*