

116-UCCh. (sig)

FORMAT 2

Submit originals (including syllabus) and one copy and electronic copy to the Faculty Senate Office
See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/> for a complete description of the rules governing curriculum & course changes.

CHANGE COURSE (MAJOR) and DROP COURSE PROPOSAL
Attach a syllabus, except if dropping a course.

SUBMITTED BY:

| | | | |
|---------------|---------------------------------|-----------------|-----------------|
| Department | Mining & Geological Engineering | College/School | CEM |
| Prepared by | Margaret Darrow | Phone | 474-7303 |
| Email Contact | margaret.darrow@alaska.edu | Faculty Contact | Margaret Darrow |

1. COURSE IDENTIFICATION: As the course now exists.

Dept Course # No. of Credits

COURSE TITLE

2. ACTION DESIRED: Changes to be made to the existing course.

Change Course If Change, indicate below what change. Drop Course

| | | | | | |
|--|-------------------------------------|-------------------------------------|-------------------------------------|---|-------------------------------------|
| NUMBER | <input type="text"/> | TITLE | <input checked="" type="checkbox"/> | DESCRIPTION | <input checked="" type="checkbox"/> |
| PREREQUISITES | <input checked="" type="checkbox"/> | | | FREQUENCY OF OFFERING | <input type="text"/> |
| CREDITS (including credit distribution) | | <input checked="" type="checkbox"/> | | COURSE CLASSIFICATION | <input type="text"/> |
| CROSS-LISTED | <input type="checkbox"/> | Dept. | <input type="text"/> | (Requires approval of both departments and deans involved. Add lines at end of form for such signatures.) | |
| STACKED (400/600) Include syllabi. | <input checked="" type="checkbox"/> | Dept. | GE | Course # | F622 |

OTHER (please specify)

3. 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 and the appropriate Faculty Senate curriculum committee. 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 all that apply)

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

4. COURSE CLASSIFICATIONS: (undergraduate courses only. Use approved criteria found on Page 10 & 17 of the manual. If justification is needed, attach on separate sheet.)

H = Humanities S = Social Sciences

Will this course be used to fulfill a requirement for the baccalaureate core?

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

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

5. 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? 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

6. CURRENT CATALOG DESCRIPTION AS IT APPEARS IN THE CATALOG: including dept., number, title and credits

GE F422 Unsaturated Soil Geoengineering
3 Credits
Offered As Demand Warrants
Fundamentals of soil physical processes, multiphase flow and transport in unsaturated porous media such as soils. Application of principles of unsaturated flow to geoenvironmental and geotechnical systems. Methods for characterization of hydraulic properties in relation to soil physical parameters in the context of geoengineering problems of flow and stability. Non-isothermal flow in unsaturated soils and its impact on subsurface environment. Biogeochemical processes affecting soil and groundwater contamination. Unsaturated flow and transport modeling including heat transfer relevant to active layer dynamics and permafrost underlain soils in Alaska and other similar cold regions. Prerequisites: GE F420 or equivalent course; or permission of instructor. Stacked with GE F622. (3+0)

7. COMPLETE CATALOG DESCRIPTION AS IT WILL APPEAR WITH THESE CHANGES: (Underline new wording strike through old wording and use complete catalog format including dept., number, title, credits and cross-listed and stacked.) PLEASE SUBMIT NEW COURSE SYLLABUS. For stacked courses the syllabus must clearly indicate differences in required work and evaluation for students at different levels.

GE F422 Unsaturated Soil Geoengineering Soil Physics
3 Credits
Offered As Demand Warrants
Fundamentals of soil physics, including: soil texture, structure, size distribution, and water retention characteristics; flow of water through saturated and unsaturated soil; soil temperature and heat flow; infiltration, runoff, and evaporation. Processes relevant to active layer dynamics and permafrost are given due consideration. physical processes, multiphase flow and transport in unsaturated porous media such as soils. Application of principles of unsaturated flow to geoenvironmental and geotechnical systems. Methods for characterization of hydraulic properties in relation to soil physical parameters in the context of geoengineering problems of flow and stability. Non-isothermal flow in unsaturated soils and its impact on subsurface environment. Biogeochemical processes affecting soil and groundwater contamination. Unsaturated flow and transport modeling including heat transfer relevant to active layer dynamics and permafrost underlain soils in Alaska and other similar cold regions. Prerequisites: CHEM F105, CHEM F106; GE F420 or equivalent course; or permission of instructor. Stacked with GE F622. (3+0) (2+3)

8. IS THIS COURSE CURRENTLY CROSS-LISTED? YES/NO NO If Yes, DEPT NUMBER (Requires written notification of each department and dean involved. Attach a copy of written notification.)

9. GRADING SYSTEM: Specify only one LETTER: X PASS/FAIL:

10. ESTIMATED IMPACT WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC. NONE.

11. 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 X Yes N/A

12. 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)

13. POSITIVE AND NEGATIVE IMPACTS

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


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. If you ask for a change in # of credits, explain why; are you increasing the amount of material covered in the class? If you drop a prerequisite, is it because the material is covered elsewhere? If course is changing to stacked (400/600), explain higher level of effort and performance required on part of students earning graduate credit. 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 course is not compromised as a result.

Although this course appears in the UAF catalog, it has never been taught in its current form. These changes will broaden the course applicability to a wider field of students, including those from Natural Resources Management (NRM). The previous course format was 3+0; however, to fully understand these soil properties, a lab component is necessary (thus the proposed change to a 2+3 format).

It is also requested that GE F422 no longer be stacked with GE F622, as the content of the graduate level course will no longer mirror the content of the undergraduate course.


APPROVALS: (Additional signature blocks may be added as necessary.)



Date 2/28/12

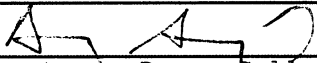
Signature, Chair,
Program/Department of:

Rajive Ganguli / Mininet Geol Eng



Date 02/29/2012

Signature, Chair, College/School Curriculum
Council for:



Date 3/2/12

Signature, Dean, College/School
of:

CEM

Signature of Provost (if applicable)

Date

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

Date

Note: The guidelines are online:

<http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-uaf-syllabus-requirements/>

The Faculty Senate curriculum committees will review the syllabus to ensure that each of the items listed below are included. If items are missing or unclear, the proposed course (or changes to it) may be denied.

SYLLABUS CHECKLIST FOR ALL UAF COURSES

During the first week of class, instructors will distribute a course syllabus. Although modifications may be made throughout the semester, this document will contain the following information (as applicable to the discipline):

1. **Course information:**

Title, number, credits, prerequisites, location, meeting time (make sure that contact hours are in line with credits).

2. **Instructor (and if applicable, Teaching Assistant) information:**

Name, office location, office hours, telephone, email address.

3. **Course readings/materials:**

Course textbook title, author, edition/publisher.
 Supplementary readings (indicate whether required or recommended) and
 any supplies required.

4. **Course description:**

Content of the course and how it fits into the broader curriculum;
 Expected proficiencies required to undertake the course, if applicable.
 Inclusion of catalog description is *strongly* recommended, and
 Description in syllabus must be consistent with catalog course description.

5. **Course Goals (general), and (see #6)**

6. **Student Learning Outcomes (more specific)**

7. **Instructional methods:**

Describe the teaching techniques (eg: lecture, case study, small group discussion, private instruction, studio instruction, values clarification, games, journal writing, use of Blackboard, audio/video conferencing, etc.).

8. **Course calendar:**

A schedule of class topics and assignments must be included. Be specific so that it is clear that the instructor has thought this through and will not be making it up on the fly (e.g. it is not adequate to say "lab". Instead, give each lab a title that describes its content). You may call the outline Tentative or Work in Progress to allow for modifications during the semester.

9. **Course policies:**

Specify course rules, including your policies on attendance, tardiness, class participation, make-up exams, and plagiarism/academic integrity.

10. **Evaluation:**

Specify how students will be evaluated, what factors will be included, their relative value, and how they will be tabulated into grades (on a curve, absolute scores, etc.) Publicize UAF regulations with regard to the grades of "C" and below as applicable to this course. (This is not required in the syllabus, but it's a convenient way to publicize this if applicable.) Faculty Senate Meeting #171:

<http://www.uaf.edu/uafgov/faculty-senate/meetings/2010-2011-meetings/#171>

11. **Support Services:**

Describe the student support services such as tutoring (local and/or regional) appropriate for the course.

12. **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. State that you will work with the Office of Disabilities Services (208 WHITAKER BLDG, 474-5655) to provide reasonable accommodation to students with disabilities.

6/30/2011

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

GE F422, 3.0 credits

Soil Physics

Fall 2012

2012-13 Catalog Description: Fundamentals of soil physics, including: soil texture, structure, size distribution, and water retention characteristics; flow of water through saturated and unsaturated soil; soil temperature and heat flow; infiltration, runoff, and evaporation. Processes relevant to active layer dynamics and permafrost are given due consideration. (Prerequisites: CHEM F105, CHEM F106, or permission of instructor) (2+3)

Texts: Hillel, D. (2004). *Introduction to Environmental Soil Physics*: Elsevier Academic Press, New York, New York.
Das, B. M. (2009). *Soil Mechanics Laboratory Manual*, 7th Ed.: Oxford University Press, New York, New York.

Course Objectives: 1) To understand the fundamental principles of soil, liquid, and gaseous phases of a soil, and their interactions; 2) To develop skills in solving typical soil physics problems, including heat flow and infiltration; 3) To develop skills in conducting laboratory testing on soils; 4) To develop technical writing skills.

Schedule: **Lecture** Monday and Wednesday, 11:45 am – 12:45 pm, DUCK 347
Lab Friday, 2:15 pm – 5:15 pm, DUCK 122

Office Hours: Monday, Wednesday 10:30 am – 11:30 am (or by appointment)

Instructor: Dr. Darrow (Office: 309 DUCK; mmdarrow@alaska.edu; 474-7303)

Grading Policy:

- Grades will NOT be curved. Grades will be based on the final percentage earned in the course, and grades will be rounded to the nearest whole percent, following standard mathematical rules. The grading system follows the plus/minus system in the UAF catalog, and is as follows:

| Letter Grade | Percentage Range | Grade Point Per Credit | Letter Grade | Percentage Range | Grade Point Per Credit |
|--------------|------------------|------------------------|--------------|------------------|------------------------|
| A+ | 97-100 | 4.0 | C+ | 76-79 | 2.3 |
| A | 94-96 | 4.0 | C | 70-75 | 2.0 |
| A- | 90-93 | 3.7 | C- | 68-69 | 1.7 |
| B+ | 87-89 | 3.3 | D+ | 66-67 | 1.3 |
| B | 84-86 | 3.0 | D | 63-65 | 1.0 |
| B- | 80-83 | 2.7 | D- | 60-62 | 0.7 |
| | | | F | <60 | 0.0 |

- Weighting of course components:

| | | |
|------------------------------------|-----|--------------------|
| Homework | 30% | (Objectives 1 & 2) |
| Laboratory Exercises and Summaries | 30% | (Objectives 3 & 4) |
| Mid-Term Examination | 20% | (Objectives 1 & 2) |
| Final Examination | 20% | (Objectives 1 & 2) |

Computer Use: MS Word, MS Excel, and Blackboard.

Physical and Learning Disabilities: If you have a physical or learning disability, please advise the course instructor of any special consideration necessary by the beginning of the second class so that attempts to accommodate you according to the American Disabilities Act can be made. Your request for accommodation must be accompanied by a written statement of your disability from an appropriate authority. For information on the disability services on campus, please visit the following web site: <http://www.uaf.edu/chc/disability.html>.

Course Policies:

- 1) You are expected to follow the University of Alaska Fairbanks Student Code of Conduct. You may find this code at: http://www.uaf.edu/catalog/current/academics/regs3.html#Student_Conduct.
CHEATING AND/OR PLAGARISM WILL NOT BE TOLERATED IN ANY SHAPE OR FORM.
- 2) Homework will be assigned on Wednesdays and due at the beginning of class on the following Wednesday (unless otherwise specified). **LATE WORK WILL NOT BE ACCEPTED.** All handwritten homework must be handed in on engineering paper, with numbered pages that are stapled together. Each problem should be clearly labeled with a logical solution and the answer indicated with a box. An assignment may be returned without a grade if illegible or difficult to follow.
- 3) Laboratory summaries / extended abstracts must be typed, with computer-generated tables or graphs, and conform to the template provided. Consider submitting your report to SafeAssign within Blackboard, to ensure that you have correctly cited all sources. Laboratory summaries must be submitted as PDF files via email to mmdarrow@alaska.edu prior to the beginning of class on the following lab after the exercise (unless otherwise specified). **LATE WORK WILL NOT BE ACCEPTED.** Although the exercise will be completed by a group, the laboratory summary should be produced by the individual.
- 4) If you will miss an exam, please notify Dr. Darrow ahead of time in order to make other arrangements.
- 5) Dr. Darrow's office hours and contact information are shown on the first page of this syllabus. If you cannot make the posted office hours, please contact her to set up another time.
- 6) Cell phones and portable electronic devices should remain OFF and STOWED during lectures, laboratory exercises, and exams. Please be polite to your professor and fellow students; do not answer your phone during class. During exams, all portable electronic devices must remain stowed, or may be placed in the front of the room in a designated spot for the duration of the test. Use of any electronics during an exam will be considered as a form of cheating (see #1 above).

Tentative Class Schedule:

| <u>Week</u> | <u>Topics</u> | <u>Assignments*</u> |
|------------------|---|--|
| <i>September</i> | | |
| 1 | Soil sampling | LAB 1 (soil sampling, site 1) |
| 2 | Soil texture, particle size distribution, specific surface | Hmwk 1, LAB 2 (soil sampling, site 2) |
| 3 | Soil structure and aggregation | Hmwk 2, LAB 3 (soil moisture, density) |
| 4 | Soil water, content and potential | Hmwk 3, LAB 4 (gradation) |
| 5 | Soil water cont. | Midterm 1 |
| <i>October</i> | | |
| 6 | Flow of water in saturated soil | Hmwk 4, LAB 5 (plasticity) |
| 7 | Flow of water in unsaturated soil | Hmwk 5, LAB 6 (SMC – low pressures)* |
| 8 | Soil air and aeration | Hmwk 6, LAB 7 (SMC – med. pressures)* |
| 9 | Soil temperature and heat flow | Hmwk 7, LAB 8 (SMC – high pressures)* |
| <i>November</i> | | |
| 10 | Soil temperature and heat flow | Midterm 2 |
| 11 | Soil compaction and consolidation | Hmwk 8, LAB 9 (thermal properties) |
| 12 | Infiltration and surface runoff | Hmwk 9, LAB 10 (Sat. flow in soils) |
| 13 | Infiltration cont., THANKSGIVING BREAK | Hmwk 10, no lab |
| 14 | Groundwater drainage | Hmwk 11, LAB 11 (Unsat. flow in soils) |
| <i>December</i> | | |
| 15 | Evaporation, water and energy balance | Hmwk 12, no lab |
| 16 | Review, FINAL EXAMINATION (Wednesday, 12/12, 10:15 am - 12:15 pm) | |

* These labs will require one to several weeks to complete.

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

| Learning Outcomes and <i>Performance Indicators</i> | Course Objective | Objective Evidence |
|---|-------------------------|---|
| (b) An ability to design and conduct experiments, as well as to analyze and interpret data. | | |
| 1) <i>Specifies necessary instruments to conduct an experiment</i> | 3 | Laboratory exercises and summaries |
| 2) <i>Develops and/or follows experimental procedure</i> | 3 | |
| 3) <i>Uses appropriate graphs or tables to display and interpret results</i> | 3 | |
| 4) <i>Analyzes results to form a conclusion about the experiment</i> | 3, 4 | |
| (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. | | |
| 1) <i>Identifies and applies current techniques to solve Geological Engineering problems</i> | 2, 3 | Homework problems, Laboratory exercises and summaries |
| 2) <i>Demonstrates skills in operating laboratory and field test equipment</i> | 3 | |
| 3) <i>Understands the benefits and limitations of modern engineering tools used in routine engineering practice</i> | 2, 3 | |