CHANGE COURSE (MAJOR) and DROP COURSE PROPOSAL

SUBMITTED BY:
Department: ES
Prepared by: Charlie Mayer
Email Contact: freem@uaf.edu

College/School: CEM
Phone: 6091
Faculty Contact: Charlie Mayer

1. COURSE IDENTIFICATION:
Dept: ES
Course #: F331
No. of Credits: 3
COURSE TITLE: Mechanics of Materials

2. ACTION DESIRED:
Change Course: X
Drop Course: 

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. Furthermore, any core course compressed to less than six weeks must be approved by the core review committee.

COURSE FORMAT:
(check one)

OTHER FORMAT (specify)
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
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, Format 6
W = Writing Intensive, Format 7
Natural Science, Format 8

5. 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

6. CURRENT CATALOG DESCRIPTION AS IT APPEARS IN THE CATALOG: including dept., number, title and credits
ES F331 Mechanics of Materials
3 Credits
Analysis of internal forces in members subjected to axial, torsional and flexural loads, singly and in combination. Stress-strain relationships and material property definitions; shear and moment diagrams; Mohr’s Circle. Applications include beams, columns, connections and indeterminate cases. Prerequisites: ES F208 or ES F209; MATH
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.

ES F331 Mechanics of Materials

3 Credits

Analysis of internal forces in members subjected to axial, torsional and flexural loads, singly and in combination. Stress-strain relationships and material property definitions; shear and moment diagrams, Mohr’s Circle. Applications include beams, columns, connections and indeterminate cases. **Prerequisites:** ES F208 or ES F209; MATH F201X: (2+3) (3+0)

8. IS THIS COURSE CURRENTLY CROSS-LISTED?

<table>
<thead>
<tr>
<th>YES/NO</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>If Yes, DEPT</td>
<td></td>
</tr>
<tr>
<td>NUMBER</td>
<td></td>
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</tbody>
</table>

(Requires written notification of each department and dean involved. Attach a copy of written notification.)

9. GRADING SYSTEM:

<table>
<thead>
<tr>
<th>LETTER:</th>
<th>X</th>
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<tbody>
<tr>
<td>PASS/FAIL:</td>
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</tbody>
</table>

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 (lkkj@uaf.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 | No change in needs from previous semesters. Library collections are adequate.

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)

ES

13. POSITIVE AND NEGATIVE IMPACTS

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

A (3+0) format allows more material to be taught in lectures. (Positive)

Dropping the recitation part of the (2+3) format means that students won’t be able to work assignments together in the recitation section. (Negative) But very few students were attending as the instructors did not make the recitation section mandatory, so very few students were getting any benefit out of the recitation section, and most students were just getting 2 lecture hours a week.
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.

We are changing the description from a (2+3) format to a (3+0) format. This course has been taught in (3+0) format for the last number of years. There used to be a recitation section, but low attendance forced that to be dropped and a 3rd weekly lecture was added. Three weekly lectures better allows time to cover all the material in this broad course.

The (3+0) format is how the course has been run for the last number of years. This paperwork is so that the course description accurately describes what is being done in the course.

APPROVALS:

<table>
<thead>
<tr>
<th>Date</th>
<th>2/21/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature, Chair, Program/Department of:</td>
<td>Engineering Science</td>
</tr>
<tr>
<td>Date</td>
<td>2/26/10</td>
</tr>
<tr>
<td>Signature, Chair, College/School Curriculum Council for:</td>
<td>CEM</td>
</tr>
<tr>
<td>Date</td>
<td>2/26/10</td>
</tr>
<tr>
<td>Signature, Dean, College/School of:</td>
<td>CEM</td>
</tr>
<tr>
<td>Signature of Provost (if applicable)</td>
<td>Date</td>
</tr>
</tbody>
</table>

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, UAF Faculty Senate Curriculum Review Committee

ADDITIONAL SIGNATURES: (If required)

<table>
<thead>
<tr>
<th>Date</th>
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<tbody>
<tr>
<td>Signature, Chair, Program/Department of:</td>
<td></td>
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<tr>
<td>Date</td>
<td></td>
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<td></td>
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<tr>
<td>Date</td>
<td></td>
</tr>
<tr>
<td>Signature, Dean, College/School of:</td>
<td></td>
</tr>
</tbody>
</table>
ES331 Mechanics of Materials
3 Credits
Fall 2009
University of Alaska Fairbanks

Instructor:  Dr. Cheng-fu Chen
Associate Professor of Mechanical Engineering
Office:  Duckering 349D, 474-7265, cf.chen@alaska.edu
Lecture:  MWF 1-2P
Classroom:  Duckering 342
Office Hrs:  MWF 2-4P or by appointment
Course website:  UAF blackboard

All classroom behavior should be strictly compliant to the UAF's Honor Code.

"Students will not collaborate on any quizzes, in-class exams, or take-home exams that will contribute to their grade in a course, unless permission is granted by the instructor of the course. Only those materials permitted by the instructor may be used to assist in quizzes and examinations.

Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses and other reports.

No work submitted for one course may be submitted for credit in another course without the explicit approval of both instructors.

Violations of the Honor Code will result in a failing grade for the assignment and, ordinarily, for the course in which the violation occurred. Moreover, violation of the Honor Code may result in suspension or expulsion."

Catalog Description. Analysis of internal forces in members subjected to axial, torsional and flexural loads, singly and in combination. Stress-strain relationships and material property definitions; shear and moment diagrams; Mohr's Circles. Applications include beams, columns, connections and indeterminate cases.

Prerequisite. C or better in ES 208 or 209; MATH 201.

Free-body diagrams will be frequently applied in this class.

Goal.  This course contents will cover analysis of internal forces in members subjected to axial, torsional, and flexural loads which are applied individually or act in combination; introduce stress-strain relationships and engineering material properties; shear and moment diagrams; and stress/strain transformation by using Mohr's Circle; and introduce applications include beams, columns, connections, indeterminate cases. The goals of the class are:

- To develop ability to analyze problems in a simple and logical manner
- To learn analytical techniques to analyze stresses and strains in an elastic object subject to various elastic loading
- To know how to conduct stress/strain transformation as a design prerequisite
- To develop capability of calculating beam deflection and learn how to draw bending and shearing diagrams to complement the calculation


Students with Disabilities. Reasonable accommodation will be provided for students with disabilities, who may wish to contact the Office of Disability Services (Phone # 474-7043, TTY 474-7045) for further assistance.

Homework is due in class on every Monday if not indicated otherwise. All written work must be presented on its due date at the beginning of the Monday class. Failure to submit homework in time will result in a total loss of the credit. You need to finish all the homework problems.
each homework assignment, only 1 or 2 problems will be randomly picked by the instructor for the grading purpose. Homework solution will be posted on the wall outside the ME student lounge.

Tests include 6 quizzes and two exams. Quizzes are usually held in the last 20 minutes of the Friday class. Quizzes must be taken when given. No make-up quizzes will be provided. The instructor will use your top 5 quiz scores for final grading, and thus you are allowed to drop one quiz. If you miss more than two quizzes, you lose your score. Each quiz is a simple test of basic concepts and should not be involved with rigorous calculations.

The mid-term and final exams are formal, the problems of which may come from, but not limited to, the materials in homework assignments, lecture presentations, and/or handouts. Exams must be taken when given. Make-up exam accommodation will be provided only for the leave of intercollegiate sports, jury duties, and (short-term) medical leave; show the instructor any supportive documents for acquiring a make-up exam.

If you are to take a makeup exam, we expect that you have no substantial knowledge of the content of the original exam. If you have found out about the exam content, you are obligated to tell this to your professor well before the scheduled time of the makeup exam.

**Appropriate Class Behavior.** Arrive on time or be prepared to be asked to leave, remain in the classroom during class time (wandering not allowed), stay alert, and participate actively. If you choose not to attend class you are on your own for taking exams. You cannot make up in-class work. You are welcome to bring a drink or snack to class, as long as you clean up after yourself and.

**Grading Policy.** Final course grades will be determined by:

<table>
<thead>
<tr>
<th>Homework</th>
<th>15 %</th>
<th>A+</th>
<th>&gt; 95.1</th>
<th>B-</th>
<th>74-78.9</th>
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<tbody>
<tr>
<td>Quizzes</td>
<td>25 %</td>
<td>A</td>
<td>90-95</td>
<td>C+</td>
<td>70-73.9</td>
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<tr>
<td>Mid-term exam</td>
<td>30 %</td>
<td>A-</td>
<td>87-89.9</td>
<td>C</td>
<td>65-69.9</td>
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<tr>
<td>Final exam</td>
<td>30 %</td>
<td>B+</td>
<td>82-86.9</td>
<td>C-</td>
<td>61-64.9</td>
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<tr>
<td>Total</td>
<td>100%</td>
<td>B</td>
<td>78-81.9</td>
<td>D</td>
<td>60-60.9</td>
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</table>

| Total       | F    | <60 |

**ABET Criteria**

**Course Outcomes**

This course helps students gain the following:

(a) an ability to apply knowledge of mathematics, science, and engineering
(e) an ability to identify, formulate, and solve engineering problems
(i) a recognition of the need for, and an ability to engage in life-long learning
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

**Professional Components**

This course meets the professional requirements through that the course subject areas are to prepare engineering sciences to the student's field of study.
### Class Schedule (revised: 2/2/2010)

<table>
<thead>
<tr>
<th>Date</th>
<th>week</th>
<th>Contents</th>
<th>Comments</th>
<th>Homework (subject to change)</th>
<th>HW due (every Monday)</th>
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<tbody>
<tr>
<td>Sep 4</td>
<td>1</td>
<td>1.1~1.5</td>
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<td></td>
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<tr>
<td>Sep 7-11</td>
<td>2</td>
<td>1.6<del>1.13, 2.1</del>2.7</td>
<td></td>
<td>HW 1</td>
<td>Ch1: 1, 7, 12, 24, 31, 40, 51</td>
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<tr>
<td>Sep 14-18</td>
<td>3</td>
<td>2.8~2.12 Quiz 1</td>
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<td>HW 2</td>
<td>Ch2: 4, 15, 17, 27, 33, 35</td>
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<tr>
<td>Sep 21-25</td>
<td>4</td>
<td>2.13~2.18 Skip Sect. 2.16</td>
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<td>HW 3</td>
<td>Ch2: 41, 45, 51, 61, 71, 77</td>
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<tr>
<td>Sep 28-Oct 2</td>
<td>5</td>
<td>3.1~3.6 Quiz 2</td>
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<td>HW 4</td>
<td>Ch3: 7, 9, 20, 23, 36, 39</td>
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<td>Oct 5-9</td>
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<td>3.6~3.8, 4.1</td>
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<td>HW 5</td>
<td>Ch3: 38, 41, 55</td>
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<td>Oct 12-16</td>
<td>7</td>
<td>4.2<del>4.6, 4.12</del>4.14 Quiz 3</td>
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<td>HW 6</td>
<td>Ch4: 9, 11, 25, 39, 43</td>
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<tr>
<td>Oct 19-23</td>
<td>8</td>
<td>4.12<del>4.14, 5.1</del>5.4</td>
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<td>HW 7</td>
<td>Ch4: 111, 126</td>
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<td>Oct 26-30</td>
<td>9</td>
<td>5.1~5.4, 6.1 Mid-term exam</td>
<td>Skip Sect. 6.5 Mid-term exam Oct. 30 (Friday)</td>
<td>HW 7</td>
<td>Ch5: 3, 19, 40, 51</td>
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<tr>
<td>Nov 2-6</td>
<td>10</td>
<td>6.1~6.7</td>
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<td>HW 8</td>
<td>Ch6: 3, 12, 22, 30, 33, 36</td>
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<tr>
<td>Nov 9-13</td>
<td>11</td>
<td>8.4, 7.1~7.3 Quiz 4</td>
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<td>HW 9</td>
<td>Ch8: 40, 43</td>
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<td>Nov 16-20</td>
<td>12</td>
<td>7.4~7.13, 9.1</td>
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<td>HW 10</td>
<td>Ch7: 5, 23</td>
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<tr>
<td>Nov 30-Dec 4</td>
<td>14</td>
<td>9.5 ~ 9.8 Skip Sect. 9.6</td>
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<td>HW 12</td>
<td>Ch9: 34, 86, 94</td>
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<tr>
<td>Dec 7-11</td>
<td>15</td>
<td>11.1~11.10 Quiz 6</td>
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<td>HW 12</td>
<td>Ch11: 22, 26, 27, 46</td>
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<tr>
<td>Dec 14</td>
<td>16</td>
<td>10.1 ~ 10.4 review</td>
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<td>HW 12</td>
<td>Ch11: 58, 62, 66, 71</td>
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<tr>
<td>Dec 16</td>
<td></td>
<td>Final Exam, 1 - 3 pm, Duckering 342</td>
<td></td>
<td></td>
<td>Ch10: 2, 21</td>
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