University of Delaware
Department of Civil & Environmental Engineering

CE 211 : Engineering Mechanics – Statics

Course Objective: to develop in the engineering student the ability to analyze any static problem in a simple and logical manner, and to apply to its solution a few well-understood basic principles of Physics.

Corequisite: MATH 243 (Analytic Geometry and Calculus C).

Textbooks

- *required*: Engineering Mechanics, Statics, by W. F. Riley and L. D. Sturges, Second Edition John Wiley and Sons, 1996. Available form the University Bookstore.
- *optional*: An Instructional Supplement for Engineering Mechanics : Statics (CIEG211), by V. N. Kaliakin and J . S. DeNatale. Available from Gnomon's Copy Center, 136 E. Main Street, Newark. This supplement contains a review of vector analysis and a large number of worked problems.

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Class Information on World Wide Web

• Class home page:
`http://www.ce.udel.edu/faculty/kaliakin/cieg_211.html`

• Class syllabus:

`PDF version:`
`http://www.ce.udel.edu/faculty/kaliakin/cieg_211_syllabus.pdf`

• Lecture Summary (updated after every lecture):
`http://www.ce.udel.edu/faculty/kaliakin/cieg_211_lectures.html`

• List of Homework Assignments (updated every time homework is assigned):
`http://www.ce.udel.edu/faculty/kaliakin/cieg_211_hw.html`

• Notes regarding vector algebra are found in the PDF file :

`http://www.ce.udel.edu/faculty/kaliakin/appendix_vectors.pdf`

NOTE : When available, the PDF (Portable Document Format) file for a given topic contains *exactly the same information* as its text counterpart. To view PDF files, a web browser must have access to Adobe Acrobat Reader with appropriate plug-in. Adobe Acrobat Reader is currently available for Windows, Macintosh, UNIX and OS/2 computers. For further information, see : `http://www.adobe.com/acrobat`

Weights For Final Grade

Homework	10%
30-minute quizzes (best 4 of 5)	30%
One (1) 75-minute Examination	20%
Comprehensive Final Examination	40%

Policy Concerning Homework

All problem sets shall conform to the "Homework Specifications" (see attached sheet); those problem sets not conforming to these specifications shall have points deducted by the grader. Homework is to be turned in at the BEGINNING of the period in which it is due. LATE HOMEWORK IS NOT ACCEPTED and will be given a grade of "zero" (0). In computing the final homework point totals at the end of the semester, the problem set with the *lowest* score will be dropped from a student's record.

Policy Concerning Extra Credit Homework

In some chapters, extra credit homework problems shall be assigned. This is intended for students that desire more challenging problems. Extra credit homework is subject to the same restrictions as normal homework (see above).

Policy Concerning Quizzes

Quizzes are administered during the *final* 30 minutes of a particular lecture. The quizzes are CLOSED BOOK/CLOSED NOTES. The four best quiz scores (out of five) shall be counted towards the final grade. Missed quizzes can not be made up. If a student misses a quiz, a grade of "zero" (0) will be assigned as the score for that quiz. If, however, a quiz is missed for an exceptional (and legitimate) reason, the average score of the remaining quizzes will be substituted for the missing quiz.

Policy Concerning 75-Minute Examination

The 75-minute exam is CLOSED BOOK/CLOSED NOTES. Missed examinations can not be made up. If a student misses the 75-minute exam, a grade of "zero" (0) will be assigned as the score for that exam. If, however, an hourly exam is missed for an exceptional (and legitimate) reason, the score of the final exam will be substituted for the missing exam.

Topics Covered and Associated Reading In Textbook

• 9/4	: Introduction to Statics / review of vector algebra	Chapter 1
• 9/9	: Concurrent Force Systems	2-1 –> 2-4
• 9/11	: Concurrent Force Systems	2-5 –> 2-7
• 9/16	: Statics of Particles (two-dimensional problems)	3-1 –> 3-3
• 9/18	: Statics of Particles (three-dimensional problems) ; *QUIZ #1*	3-1 –> 3-3
• 9/23	: Rigid Bodies (an introduction)	4-1 –> 4-2
• 9/25	: Vector Products; Moment of a Force About a Point	4-3
• 9/30	: Scalar Triple Products; Moments About an Axis ; *QUIZ #2*	4-3
• 10/2	: Couples	4-4
• 10/7	: Equivalent Force/Moment Systems; Resultants	4-5, 4-6
• 10/9	: Equilibrium of Rigid Bodies; Free-Body Diagrams ; *QUIZ #3*	6-1, 6-2
• 10/14	: Equilibrium in Two-Dimensions	6-3
• 10/16	: Equilibrium in Three-Dimensions	6-4
• 10/21	: Two- & Three-Force Bodies; Indeterminacy	6-3
• 10/23	: Analysis of Plane Trusses – Method of Joints	7-1, 7-2
• 10/28	: Analysis of Plane Trusses – Method of Sections ; *QUIZ #4*	7-2
• 10/30	: Analysis of Plane Trusses – Special Topics	7-2
• 11/4	: Analysis of Frames	7-4
• 11/6	: *MIDTERM EXAMINATION*	
• 11/11	: Analysis of “Machines”	7-4
• 11/13	: Center of Mass & Center of Gravity; Centroids by Integration	5-1 -> 5-3
• 11/18	: Centroids of Composite Bodies	5-4, 5-5
• 11/20	: Distributed Loads on Beams	5-6
• 11/25	: Internal Forces in Members; Axial Force & Torque in Bars, etc. ; *QUIZ #5*	8-1 -> 8-3
• 11/27	: *NO CLASS (Thanksgiving holiday)*	
• 12/2	: Shear Force & Moments in Beams	8-4, 8-5
• 12/4	: Shear Force & Bending Moment Diagrams	8-5
• 12/9	: Review of course / Teaching evaluations	

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Homework Specifications

1. Diagrams and Sketches

a) Are to be neatly made with due attention to correct proportions of parts;

b) Are to be large enough to show all details clearly;

c) Are to be complete (i.e., all necessary quantities shown and properly labeled);

2. Problem Solutions

a) Begin the solution of each problem on a *new* page.

b) All important steps in the solution are to be shown.

c) All symbols must have their meanings clearly defined or shown on a diagram; exceptions are physical constants commonly used in class.

d) Units are to be indicated after each answer.

e) All answers are to be <u>underlined</u> or placed in a prominent space (e.g., in a "box").

f) Always put a zero (0) on the left of the decimal point in decimal fractions less than one.

3. Form

a) Preferably use engineering pads (available at the bookstore) for all computations. Do not submit homework on the back of computer print out, etc.

b) The heading at the top of *each* sheet must include *name, date, problem set number* and *sheet number*.

c) Letter or write legibly.

d) If erasures are necessary, make sure they are done neatly.

e) Use only one side of the paper.

f) Do not use either a very hard or a very soft pencil.

g) Staple sheets together.

EXAMPLE: see following page for a sample homework format.