INTRODUCTION TO STRUCTURAL ENGINEERING

Class Hours: Tue Fri: 12:00 - 1:50 pm Location: DCC 324

Instructor: Gianluca Cusatis
Office: JEC 4048
Phone: 276 - 3956
e-mail: cusatg@rpi.edu

Instructor Office Hours: Tue Fri: 2:00 – 4:00 pm
You are also welcome to make an appointment for a different time.

Teaching Assistants: Jayesh Shinde (graduate student)
Office: JEC 5304
Phone: 276-8071
e-mail: shindj@rpi.edu

Textbook: Fundamentals of structural Analysis, Third Edition, K. M. Leet, C.-M. Uang, and A. M. Gilbert. Mc Graw Hill, 2005.

Catalog Description: Introduction to the elastic behavior of structural components. Analysis of statically determinate systems. Deflection calculations by virtual work and elastic load methods. Analysis of simple statically indeterminate structures. Influence lines. Interaction of structural components. Typical structural engineering loads.

Course Objective: The objective of this course is to develop a working knowledge of the basic principles of structural analysis and design. Students will do this by building on the knowledge gained through statics (ENGR 1100) and mechanics of materials (ENGR 2530). Upon successful completion of the course, students will have a basic understanding of structural engineering as well as specific structural analysis tools for those who choose to pursue a career in structural engineering. Having successfully completed this course, you will have the necessary skills to take senior-level structural engineering courses such as Structural Analysis (CIVL 4440), Steel Design (CIVL 4070), and Concrete Design (CIVL 4080) and graduate courses such as Structural Dynamics (CIVL 6450).

Course Outcomes: After successfully completing this course students will be able to:

1. Use simple structural analysis software
2. Compute external reactions and bar forces for statically determinate trusses.
3. Compute external reactions and internal forces (axial and shear forces, bending moment) for statically determinate beams and frames.
4. Draw internal force diagrams.
5. Sketch deflected shapes of beams and frames.
6. Derive the differential equation governing the elastic curve of beams.
7. Compute deflections and rotations of trusses, beams, and frames
8. Compute influence lines for statically determinate structures
9. Design simple structural members
10. Analyze simple statically indeterminate structures

Prerequisites: ENGR 2530 – Strength of Materials or equivalent

Exam Dates: Exam # 1: Tuesday September 30, 2008
Exam # 2: Friday October 31, 2008
Exam # 3 (Final Exam): TBA

Homework Policy: Homework is due no later than 5:00pm on the due date. Late homework will be accepted up to 2 days after the due date but with a 50% penalty. Collaboration with your classmates is encouraged. Solving homework problems within study groups is encouraged. However, it is also suggested that each student attempt the homework problems on their own prior to meeting with their study group so as to understand their personal deficiencies. In this way, group study will be most effective for each student. Each student must hand in each individual problem. Copying is not acceptable. If copying is suspected, you will be asked to demonstrate your solution to the instructor. Homework assignments are worth a total of 100 points but they are granted only upon fulfillment of the advance reading requirement.

Advance Reading Policy: In advance of most classes (see class schedule for details) students are required to read the material that will be presented in that class. In addition, students are required to summarize the key concepts, and hand in the summary (1 to 3 pages) at beginning of class. The advance reading (AR) requirement is considered fulfilled if at least 90% (16 out of 18, see class schedule) of the AR assignments are handed in.

Grading Policy: Grades between 0 and 100 are assigned based upon the level of mastery of the subject by the student. Grades will not be curved.

Final HW Grade = Total homework points earned

Final Grade = 0.25 (Exam # 1) + 0.25 (Exam # 2) + 0.30 (Exam # 3) + 0.20 (HW).

A = 96-100; A- = 91-95; B+ = 86-90; B = 81-85; B- = 76-80; C+ = 71-75; C = 66-70; C-= 61-65; D+= 56-60; D = 51-55; F < 50.

Academic Integrity: Student-teacher relationships are built on trust. Acts, which violate this trust, undermine the educational process. The *Rensselaer Handbook of Student Right and Responsbilities* defines various forms of Academic Dishonesty and everyone should be familiarized with these. In this class, all HW and AR assignments that are turned in must represent the student's own work. Submission of any assignment that is in violation of this policy will result in a penalty of ten (10) points on the final grade.