Course Name: Mechanics of Materials I  
Course Code: ENSC-301  
Semester: Spring 2017  

Scheduling: Tuesday and Thursday, 2:05 p.m. - 3:30 p.m.

Instructor Data:  
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Office hours: after classes (or email the teacher for an appointment)

Prerequisites: ENSC-205 - Statics

Course Description
The theory of elasticity is presented from an applicative viewpoint, in order to understand the capabilities (and the limitations) of this mathematical model in predicting the behavior of real solids and structures. The course introduces the concepts of strains and stresses and covers the behavior of common construction materials (e.g., metals, concrete) and their failure criteria. The static solution of 1D models of beams and shafts and the determination of their stress fields and deformations under several loading conditions (axial loading, bending, searing and torsion) will allow the student to design mechanical structures and machine parts. The course also covers the computation of the deformations of these components and the solution of statically indeterminate structures. Finally, the evaluation of stability of compressed slender beams is tackled.

Course Objectives
By the end of the course, the students will be able to check and design structures composed by systems of beams; in particular, they will be able to compute the stress fields in statically determinate and indeterminate beams, to evaluate their strength, and to analyze the stability of compressed members.

Teaching Method
The course will consist of lectures, exercises, and in-class quizzes. Reading of material pertinent to a given lecture should be done prior to the lecture. Home problems will be suggested for each lecture and they should be solved after the relevant class and discussed or submitted for correction up to one week after their assignment. Home problems will be particular useful for the students to have a feedback on their personal level of understanding of the topics and on their ability to solve exercises. Homework problems will not be taken into consideration for the final score; therefore, students are encouraged to check their ability, in order to receive proper support, if needed. Students are strongly advised to solve the home problems, as they will be fundamental for the in-class quizzes and exams. In addition, two mandatory sets of home problems will be assigned prior to the midterm and final examination; these will be graded and their score may replace one third of the score of the relevant in-class exam.

Assessment Criteria
The final score will be the composite score of:
- in-class quizzes (20%);
- midterm exam (35%);
- final exam (45%).

One third of the midterm and final exam scores may be replaced by that of a mandatory homework assigned before the examination date, hence contributing to the total score with 11.7% and 15%, respectively.

Homework and in-class exams must: (1) be neat and organized; (2) have the pages numbered; (3) contain your procedure; (4) have the final answer underlined; and (5) include all units of measure.
Reference textbook

Additional material may be provided through Blackboard.