



University of Michigan

—◆交大密西根学院◆—

UM-SJTU Joint Institute



Shanghai Jiao Tong University

## Vm311: Strength of Materials Fall 2016

**Course Pre/Co-requisites:** Vm211 Introduction to Solid Mechanics, Vv256 Applied Calculus IV

### Reference Textbooks [no textbook required]:

- [1] Boresi. Schmidt, Advanced Mechanics of Materials, 6<sup>th</sup> ed., Wiley, 2003
- [2] Barber, Intermediate Mechanics of Materials, 2<sup>nd</sup> ed., Springer, 2011
- [3] Gere & Timoshenko, Mechanics of Materials, Krieger Pub Co; 3<sup>rd</sup> edition (June 1, 1983)

### Lecture Time and Locations:

Tuesday: 14:00-15:40, F105 (东下院)

Thursday: 14:00-15:40, F-105 (东下院)

### Instructor:

Prof. Roberto Dugnani

E-mail: roberto.dugnani@sjtu.edu.cn

Office: E203, JI building

Office Hours: Tuesday and Thursday 16:00-17:30

Office hours also available **by appointment** (please e-mail to set-up an appointment).

### Teaching Assistant:

Qingjie Qi (齐庆杰)

Email: [qiqingjie@sjtu.edu.cn](mailto:qiqingjie@sjtu.edu.cn)

Office hours: 18:00-20:00 every Thursday, e-reading room, JI Building

### Homework problems:

Students must complete all assignments. Late assignments will be graded with a **10% reduction in grade for each day** after the due date. Homework should show evidence of work, homework problems with only an answer will not be accepted. Partial credit will be given only for homework and calculations meeting acceptable standards.

### Grading Scheme

Homework and Projects: 22%

Quizzes: 3%

Midterm Examination: 50% (25% each)

Final Examination: 25%

### Academic Integrity:

The learning derived from a course is based on student integrity and faculty support of a just learning environment. The faculties strive to enforce the policy and are open to any questions and discussion from the students. In this course you may consult fellow students for discussion but you are responsible for the originality of all your submitted work.

### Course Objectives

Encourage independent thinking

Develop a deeper understanding of the basic principles in mechanics of materials

Promote economic thinking to obtain first-order solutions of complex problems

Among the specific topic covered:

- Energy methods;
- Buckling of columns, including approximate methods;



University of Michigan

# 交大密西根学院

UM-SJTU Joint Institute



Shanghai Jiao Tong University

- Bending of beams of asymmetrical cross-section;
- Shear center and torsion of thin-walled sections;
- Membrane stresses in axisymmetric shells;
- Elastic-plastic bending and torsion;
- Axisymmetric bending of circular plates

Week	Topic
1 – Sep	Introduction and review of basic concept
2 – Sep	Bending of beams of asymmetrical cross-section
3 – Oct	Elastic-plastic bending/break
4 – Oct	Elastic-plastic torsion
5 – Oct	Energy Methods
6 – Oct	<b>Midterm 1</b>
7 – Nov	Rayleigh-Ritz method
8 – Nov	Castigliano's Theorems/ Introduction to FEA
9 – Nov	<b>Midterm 2</b>
10 – Nov	Maxwell Reciprocal theorem
11 – Nov	Buckling of columns
12 – Dec	Shear center and torsion of thin-walled sections
13 - Dec	<b>FINAL EXAM</b>

