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# ARCHITECTURAL STRUCTURES II

Syllabus

Winter 2009

<http://www.umich.edu/~arch324>

## CATALOG DESCRIPTION

This course covers the basic principles of elastic behavior for different materials such as wood, steel, concrete and composite materials, and compares the properties and applications of materials generally. It investigates cross sectional stress and strain behavior in flexure and in shear, and torsion as well as the stability of beams and columns. The qualitative behavior of combined stresses and fracture in materials is also covered. Prerequisite: ARCH 314

## OBJECTIVES

Students are introduced to the fundamentals of analysis and design of simple structural members in steel, wood and concrete. Basic code requirements strength, stability and serviceability are discussed. Principles of composite materials design, structural continuity, and combined stresses are covered.

## ORGANIZATION

A series of lectures are regularly given on each Monday and Friday. The lectures cover concepts and procedures, including demonstrations. Each Wednesday the class is broken into smaller sections for recitation in which problems can be solved with more student/instructor interaction. Solutions to homework problems are entered online through the course website. Three tests are used to measure student comprehension of the material. In addition a construction/testing project is used to allow students an opportunity to apply concepts to a physical design. Computer facilities, including software, are available for supporting computations. Facility and equipment for structural model testing is also available.

## EVALUATION

Evaluation is based upon three tests (39%), a series of home work problems (48%), and a construction/testing project (13%). All work will be set on a 100 point scale with a full range of letter grades assigned.

	A	100. – 93.0	A-	92.9 – 90.0	
B+	89.9 – 87.0	B	86.9 – 83.0	B-	82.9 – 80.0
C+	79.9 – 77.0	C	76.9 – 73.0	C-	72.9 – 70.0
D+	69.9 – 67.0	D	66.9 – 63.0	D-	62.9 – 60.0
	E	59.9 – 0.0			

By University policy the minimum passing grade is a D (63.0).

## LECTURES AND EXERCISES

Solutions to exercises (example problems from the text) are provided in the course pack. These as well as lecture slides are also available on the course web site. In addition, the lectures will be recorded and posted to the web site. Students are expected to review any lectures which they miss. The exercises will not be collected or scored, but solutions can be discussed in the Wednesday recitation sessions or by appointment with GSI's.

## PROBLEMS

A set of homework problems covering the primary aspects of the course will be given to each student. Each student will have a unique set of problems to solve. Students submit solutions online for scoring. Each problem may be worked up to 3 times (3 different data sets) for credit. The best score from one of the 3 trials will be recorded. Late problems will be penalized at -5% per day up to a maximum of -35%. Problems are accessed through the course web site. A FAQ which explains the policy concerning the problems is also posted.

## PROJECT

A group project to design, construct and test a compression structure will be assigned during the course. It will be documented with both a preliminary and a report which together count 13% of the final grade.

## TEXT

The required text is *Structural Principles*, by I. Engel. (Prentice Hall, 1984). A course pack is available at the TCAUP Media Center. Additional material will be posted to the course web site <http://www.umich.edu/~arch324>.