

University of Massachusetts, Amherst

Department of Civil & Environmental Engineering

CEE 211: Perspectives on the Evolution of Structures (Spring 2012)

Instructor:

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Office Hours:

T, Th 4-5 also by appointment or drop-in

Course web page: <http://www.ecs.umass.edu/~perspectives>

Catalog Description: Learn how to interpret and understand the built environment through technical, visual, and social analysis and critique of bridges, buildings, and designers.

Prerequisites: R1 math.

Text:

Billington, DP (1983) *The Tower and the Bridge*. Princeton Architectural Press, Princeton, NJ.

Course Learning Objectives: Students should leave this course with an ability to interpret the built environment from the perspective of the structural engineer.

Topics Covered:

- The development of long span bridge forms
- Development of high rise building forms
- Development of reinforced concrete bridge and shell forms
- The role of structural considerations in determining structural forms
- The rise of sustainability in the design of high rise buildings

Class Schedule:

Lectures, TuTh 2:30-3:45, Marston 211

Journal exercise:

Students are required to write three journal entries over the course of the semester on their observations of and reflections upon the built environment. A fourth journal entry is required as a reflection upon the peer-editing exercise conducted as part of the final project. Journal entries should be concise, roughly 250 words, and should include images or sketches where practical. Journal entries will be due at midnight after the fifth, 10th, and 15th class meetings, with the peer-editing journal entry due at midnight after the day on which the exercise is conducted. Journal entries will be

graded as 'complete/incomplete', but it should be noted that merely writing *something* does not ensure a mark of 'complete'; entries must be thoughtful and substantive to earn a mark of 'complete'. The journal exercise is to be completed in moodle.

Course outcomes: Upon completion of the course students should be able to: For the structures discussed in class you should be able to:

1. identify from an image a structure's designer and location
2. explain how form relates to forces in the structure
3. explain the social, symbolic, and scientific significance of the structure (GWB, Eiffel Tower, Hancock, and Salginatobel at least)
4. explain qualitatively how the loads are transferred by the structural system to the ground
5. perform simple calculations to determine the forces in the main structural members

For structures which you encounter in the world around you, you should be able to:

1. explain qualitatively the means by which loads are transferred to the ground
2. evaluate the qualifications of the structure as a work of structural art
3. research the social, symbolic and scientific aspects of the structure and express your findings clearly in both written, graphical, and spoken form

Assessment Methods: Students' performance in the class will be assessed through a midterm exam, homework assignments and a final project based on the following weighting:

Homework (includes journal)	1/3
Tests	1/3
Final Project	1/3

Academic Honesty: Students are subject to University policies regarding academic honesty. These policies are available at http://www.umass.edu/dean_students/code_conduct/acad_honest.htm

Homework policies:

Homework is due at the beginning of class on the due date unless otherwise specified. You are strongly encouraged to work on the analysis homework in groups, but you should feel comfortable claiming your own submission as your own work. On the front page of the submission, write the names of those students with whom you have collaborated. **Homeworks which do not meet minimum standards of neatness and clarity will be returned ungraded.** These standards include writing with a sharp pencil on only a single side of engineering/graph paper and beginning each new problem at the top of a fresh page.