

BSCI 7100-001 – Building Great Structures

Fall 2007

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Overview

The purpose of this course is to gain a conceptual understanding of the behavior of structural systems using significant works of engineering and architecture, as well as the temporary structural systems used to build them. Through readings, observation, and conceptual analysis we will explore the various forces (physical, social, cultural, etc.) that shape significant structures. In addition, we will analyze some of the catastrophic failures that have occurred involving significant structures, and the role construction might have played in causing or preventing these failures. We will seek to find the influence that construction systems and processes have in shaping great works of Engineering and Architecture.

Objectives

- Classification and behavior of Structural Systems
- Temporary Structures
- Individual research and discovery
- Conceptual Structural Analysis
- Communication

Class Procedure

- Instructor presentation
- Student presentation
- Discussion
- Field Trips/Guest Lectures

Readings

- Multiple readings: See bibliography on course website
- Each student reads and reviews a major book on a selected great structure

Assignments

- Research - INTERNET/Library/other
- Videos
- Modeling – physical, computer
- Reports
- Presentations

Course Components and Grading

- Homework - 10%
- Structural Systems Test – 15%
- Topic 1 – Structural/Construction Failures - 20%
- Topic 2 – Construction of a Significant Structure - 30%
- Comprehensive Final – 20%
- Attendance/Attitude/Participation (subjective) - 5%

Communication

- Written report
- Analog (physical) or digital modeling
- Verbal presentation using presentation software

Tentative Course Schedule

Class	Day	Date	Topic	Homework
1	Thu	8/17	Introductions - Objectives	
2	Tue	8/22	The Issues of Structure	
3	Thu	8/24	Structural Materials	
4	Tue	8/29	Structural Systems: Post and Beam	
5	Thu	8/31	Structural Systems: Walls	
6	Tue	9/5	Structural Systems: Arch/Vault/Dome	
7	Thu	9/7	Structural Systems: Trusses	
8	Tue	9/12	Structural Systems: Space Frames	
9	Thu	9/14	Structural Systems: Grids/Plates/Shells	
10	Tue	9/19	Structural Systems: Membranes	
11	Thu	9/21	Structural Systems: Foundations	
12	Tue	9/26	Prestressed Concrete Structures	
13	Thu	9/28	Review	
14	Tue	10/3	MIDTERM EXAM	
15	Thu	10/5	Structural Failures Case 1	
16	Tue	10/10	Structural Failures Case 2	
17	Thu	10/12	Structural Failures Case 3	
18	Tue	10/17	Field Trip	
19	Thu	10/19	Paper 1 First Draft	
20	Tue	10/24	Building Gothic Cathedrals	
21	Thu	10/26	Building Early Bridges	
22	Tue	10/31	Paper 1 Presentation – Students 1-5	
23	Thu	11/2	Paper 1 Presentation – Students 6-10	
24	Tue	11/7	Building Great Structure 1	
25	Thu	11/9	Building Great Structure 2	
26	Tue	11/14	Paper 2 First Draft	
27	Thu	11/16	Field Trip	
28	Tue	11/28	Review	
29	Thu	11/30	Paper 2 Presentation – Students 1-5	
30	Tue	12/5	Paper 2 Presentation – Students 6-10	
			FINAL EXAM	