

TUFTS UNIVERSITY
Department of Civil and Environmental Engineering

EN-80:
STRUCTURAL ART
FALL 2011

Course Description

A study of the relationship between engineering and the modern world with special emphasis on structural engineering as a modern art form. Discussion of the relationships between engineering, politics, economics and art. Introduction to scientific and engineering knowledge as human creations that have developed historically in response to human needs and aspirations. Design challenges concern the design and representation of a series of simple structures, which culminate in a final presentation.

Freshman Experience (proposed as a full-credit course):

1. Leadership and creativity in engineering: *lecture material on great works with interdisciplinary emphasis on structural engineering, architecture and the fine arts. Secondary interdisciplinary focus on major issues related to the modern world: Scientific Revolution, Enlightenment, Democratic Revolutions and Industrial Revolution: steam engine, cholera epidemics, electric power. Students exercise creativity in a small-group studio environment led by senior mentors, with experience from CEE-24: Steel Design. Work is presented and critiqued in oral, studio format.*
2. First-year design experience: *design assignments integrated throughout semester, with final presentations.*
3. Awareness of Self and Society: *work is completed in teams under the direction of senior & grad student mentors participating in CEE-120: The Art of Building. Issues related to independence, teamwork and responsibility are addressed real-time as they arise.*
4. Ethics: *introduction to Moral Philosophy in lecture. Recitation discussion on what is “the good”? Ethics and personal responsibility are showcased in lectures on great work. These issues are motivated and challenged by the teamwork required to meet the challenges assigned.*
5. Roadmap for Tufts Engineering Education: *offered from a Civil Engineering perspective. Curriculum is explained in historical context, highlighting motivations for different components of curriculum, and how they interface with education required for life after Tufts.*
6. Extracurricular activities: *developed in coordination with Senior mentors.*
7. Technical Proficiency: *design challenges require technical proficiency at the entry level. Emphasis on the art of modeling, estimation, assumptions and simple calculations.*

Tentative Lecture schedule:

1. What does it mean to be educated as a Civil Engineer?
2. The Structural Artist: Gustave Eiffel
3. Natural and Moral Philosophy
4. Democracy and Industry
5. Thomas Telford
6. Victorian London
7. Roebling
8. Robert Maillart—Salginatobel Bridge
9. Robert Maillart—Valtschielbach Bridge
10. Drawing, the Language of the Engineers
- 11. Midterm I**
12. The Tower and the Cathedral
13. Fin de Siècle Paris and Vienna
14. Modern Architecture
15. Othmar Ammann
16. Anton Tedesko
17. Pier Luigi Nervi
18. Felix Candela
19. Fazlur Khan and Bill LeMessurier
20. Contemporary Boston Architecture
- 21. Midterm II**
22. Christian Menn
23. Heinz Isler
24. Jörg Schlaich
- 25. Final Presentations**
- 26. Final Presentations**