Analysis of Historic Structures

Final Paper Assignment and Schedule

You will complete a final paper for this course on an approved topic. Your final paper must contain the following:

> HISTORY: A literature review of relevant articles, together with a general technical and social history of the structure(s) that you are studying. This historical section should provide enough background to identify the key questions for your structural analysis. In particular, the historical review should critique and discuss any prior structural studies of your topic. This section must comprise at least one third of your paper.
>
> STRUCTURAL ANALYSIS: You will present a simplified structural analysis based on the actual geometry of your structure(s). Clearly identify the source of all data, together with your assumptions, and the key aims of your analysis. State clearly: what is the purpose of your analysis? It could be largely historical, i.e., to understand the intentions and knowledge of a designer, or to compare two contemporary buildings. Or it could be largely analytical, i.e., to verify the safety or collapse mode of a large historical structure. This section must make up at least one third of your paper. To clarify your paper, you may consider including some of the detailed analysis in appendices, so that you may concentrate on the results in the body of the paper. As an example of the type of structural analysis that you may do, see the structural study of the Eiffel Tower.

The remaining one third of your paper is up to your own discretion. You may expand on the history or the structural analysis or both.

The final paper is worth 50% of your grade.
(Homework, presentations, and attendance make up the remaining 50%.)

Schedule for final project:

5-minute presentation of proposal	**Oct 20 – Nov 3**
Hand in preliminary calculations	**Nov 17**
Make 12-minute final presentation	**Dec 1, 8**
Hand in final paper (15-25 pages)	**Dec 10**

SUGGESTIONS FOR PAPER TOPICS

Structures:

Iron chain suspension bridges in ancient China (3rd C AD)

Mamluk domes in Cairo (16th C)

Guastavino tile vaulting in Boston (19th-20th C)

Metal truss bridges (19th-20th C)

Granite arch bridges in New Hampshire (1840's)

Moorish Bridges in Spain (14th C)

Romanesque churches in France (11th-12th C)

Early flying buttresses in France (13th C)

Inca suspension bridges in Peru (14th C)

Timber covered bridges in New England (19th C)

Roman vaulting, acueducts, or bridges (1st - 2nd C AD)

Masonry vaulting in the ancient Aegean – Mycenaean tholos tombs (16th C BC)

Masonry vaulting in Mesoamerica (8th – 15th C)

Aztec flat slab floor systems (14th – 15th C)

Masonry fan vaulting in England (14th-15th C)

Iron bridges and viaducts by Eiffel (19th C)

General research topics:

Comparison of masonry vault typologies

Pointed versus circular arches

Seismic resistance of masonry structures

Form of Gothic flying buttresses