TERM PAPER CRITERIA (25% of Final Grade)

The term paper is to be about 10-12 double-spaced typewritten pages of text (3,000 words, 12pt font), which does not include the “Scientific Appendix”.

Each student chooses a structure based on all or most of the following criteria, wherein the structure should be:

1. Of large enough scale so that the visible form is directly influenced by the structural design
2. In an urban environment
3. Well enough documented so that loads, dimensions, and materials are clear and such that costs, political influences, and social problems can be found or inferred
4. Visited and photographed or documented as to its appearance and its reaction on visitors, users, and the residents of its surrounding community,
5. Chosen by the student.

The paper shall contain three parts:
- scientific (25%)
- social (30%)
- symbolic (30%)

An additional 15% will be for the form and writing; this includes the writing style, organization, the presentation, the illustrations, the end notes, and how illustrations are integrated into the text. In addition, references are essential to document all aspects of the paper. Reference quotations properly and also give the reason for the quote and interpret its meaning.

Note: the Internet can be used to locate articles (www.structurae.net is decent for preliminary research), but is not to be used as a primary reference unless it is from an on-line journal. It is always good to have maps, which locate the structure and give some sense of its surroundings. All types of analyses should be comparative as much as possible.
SCIENTIFIC CRITERIA

A discussion of the relationship between form and force is the essence of this section of the paper. For example, the Eiffel Tower form - spreading legs - reduces axial wind forces on the legs, and the form is related to the bending moment diagram. Discuss how the form and force relationship (or not) affect and relate to the efficiency of the structure.

Calculations can be made following the examples shown in the “Structural Studies”. See separate document/website for listing of Structural Studies. Your AI and course instructor are available for additional assistance.

An appendix related to this “Scientific” portion of the paper should contain some extra details that inform the writing. For example, the numerical calculation of stress of some members and a comparison to the material capacity as related to the discussion of efficiency.

You will each be required to set up on visit with your AI to go over calculations for your chosen structure. Plus a draft of your calculations will be submitted week 11. These steps are to assist you and make sure that you are on the right path.

SOCIAL CRITERIA

The primary social measure is cost of construction expressed in terms of scale, of time, and of place. The meaning of cost is sharpened by comparisons to similar works. For this purpose, refer to the Engineering News Record Construction Cost Index (see Blackboard posted ENR Cost Tables). For example in comparing the $35 million cost of the Golden Gate Bridge (San Francisco, 1937) to the $325 million cost of the Verrazano Bridge (New York, 1964), we relate the 1937 bridge to the 1964 New York Bridge

1. Scale: Golden Gate 6 lanes, Verrazano 12 lanes, therefore 35M x 2 = $70M.

2. Time: The index for 1937 is 235 and for 1964 it is 936 so that: 70 x 936/235 = 70 x 4 = $280M.

3. Place: The 1964 index for San Francisco is 1051 and for New York 1233 so that 280 x 1233/1051 = $328M.

Thus these two bridges of almost identical span had very close to the same initial cost. Other factors to discuss are construction delays and continuing maintenance, although these may be more difficult to define numerically. The history of a project normally comes under the social part, as does a description of the construction.

SYMBOLIC CRITERIA

Illustrate the paper with photographs, pictures, and drawings in sufficient detail to make clear the visual analysis of the structure. This analysis includes such questions as the thinness of the structure and its integration and relationship to the surroundings (contrast and affinity). A symbolic discussion includes the visual analysis of the form and details, which relate the visible parts to the load-carrying structure. Also included is the meaning of the structure ethically in the sense of a proper use of resources (both materials and money). Finally, describe the meaning of the work to the culture and how its meaning
has changed over time. At the end give a carefully argued overall evaluation in which your own opinions are expressed and explained.

Due Dates

- **Week 7:** Submit to Blackboard before precept your choice of 2 potential structures for your term paper. Include a photograph and a brief statement explaining your choice (.pdf). To be returned with feedback the following week.

- **Week 10:** Submit to Blackboard by the end of the week (5PM Friday) an outline of your term paper. Refer to the term paper guidelines for what to include. Your outline does not need to be exhaustively detailed, but should show some preliminary investigation of your structure of choice.

- **Week 11:** A hard copy preliminary draft of the scientific calculations is due in precept. These calculations returned with feedback in the last week.

- An electronic copy of the final paper must be uploaded to Blackboard by 5 PM Dean’s Date and a hard copy submitted to the preceptor’s mailbox by 9 PM Dean’s Date.

Late Papers

We are not allowed to accept late papers or grant extensions without permission from the Dean of your College. If you plan to hand in the paper late, please see your Dean (before Deans Date) and have him/her contact the instructor. If permission is granted from the Dean to hand in the term paper late, it will incur a 10-point per day penalty. We will not accept ANY papers more than 3 days late.

Academic Integrity

Please refer to Princeton’s Rights, Rules, Responsibilities manual to make sure that you are aware of academic violations such as plagiarism, unauthorized multiple submission, false citation, false data, and attempt to gain an unfair advantage. Take care to not commit any of these violations when writing your paper and at the end of your paper include this sentence:

You may ask classmates (or other students) to read a draft of your paper, to identify flawed or unpersuasive arguments, and to mark grammatical errors or awkwardly written sentences. You may NOT, however, have the classmates (or other students) revise or edit the paper for you. Nor may you allow them to suggest new or better arguments that you did not come up with yourself. In other words, you are responsible for generating both the content of the paper and its style or presentation, and you cannot allow anyone else to take these responsibilities from you. Note that plagiarism and self-plagiarism (submitting the same paper to two classes – even though it is your own work) is and subject to one year’s suspension.

“This paper represents my own work in accordance with University regulations” and sign your name. If you have any questions regarding these policies please discuss with your preceptor or the instructor.