ENGR: 2110 “FAILURE IS ALWAYS AN OPTION” SPRING 2019

After the space shuttle Columbia disintegrated while reentering Earth’s atmosphere in 2003, civil engineer Henry Petroski wrote a New York Times essay titled “Failure is Always an Option.” He described how engineers consider failure: “[T]he way engineers achieve success in their designs is by imagining how they might fail” (2003). For this assignment, you will write about a different failure while using Petroski’s essay to help you consider ethical decision-making in engineering.

OVERVIEW OF REQUIREMENTS

• Individual essay for 10% of course grade
• Two drafts (first and final)
• 1000-1250 words
• One figure
• Three credible sources, including Petroski
• APA format
• One 25-minute appointment with the Hanson Center

ASSIGNMENT GUIDELINES

In this individually written essay, you will analyze one specific structure or system and how it failed. Write a cohesive, 1000-1250-word paper about one of the subjects from the list below. If you choose another topic, you must have it pre-approved by HCTC Assistant Director Dr. Sarah Livesay.

Hartford Civic Center, 1978
Oakland Bay Bridge, 1989
Autoroute 19 de la Concorde Overpass, 2006
Sando Arch Bridge, 1939
Oklahoma City Murrah Federal Building, 1995
Bjork-Shiley Tilting Heart Valve, 1986
L’Ambiance Plaza, 1987
Charles de Gaulle Airport, 2004
Banqiao Reservoir Dam, 1975
Rana Plaza Building, 2013
Hyatt Regency Walkway, 1981
Morand Bridge, 2018
Delhi Dam, 2010
Cypress Viaduct, 1989
Sewol Ferry, 2014
Sampoong Superstore, 1995
Falls View Bridge, 1938
St. Francis Dam, 1928
Peace River Bridge, 1957
Antelope Valley Freeway, 1971 and 1994
Florida International University Bridge, 2018
Kemper Arena, 1979
Schoharie Creek Bridge, 1987
Minneapolis I-35 Bridge, 2007
Big Blue Crane, 1999
Second Narrows Bridge Collapse, 1958
Mainus River Bridge, 1983
Colorado State Route 470 Bridge, 2004

Your essay must do all of the following:
1. Explain for a non-engineering audience how and why the structure failed using basic statics principles. Incorporate and define relevant statics concepts from class.
2. Discuss the ethical failure(s) that led to the structural collapse. Reflect on the broader ethical implications of this disaster.
3. Address this question: What responsibilities do engineers face in the design and maintenance of structures? Consider this regarding your failure and also engineered structures generally.
4. Include at least one figure (with citation and caption) that enhances your discussion.
5. Cite at least three sources: the Petroski article and two other credible sources (no Wikipedia).
6. Cite all references within the essay. Include a References page in APA format.
Statics Writing Assignment

Questions that will help you craft your essay include:
- Did a design flaw involving insufficient consideration of moments, loads, and/or forces cause the structure to fail?
- Did the structure lack redundant safety mechanisms?
- Was the failure preventable?
- What steps could have been taken before the structure failed?

REQUIRED AND RECOMMENDED READING
- “Failure is Always an Option,” Henry Petroski (Note: You must read and cite this article.)
- National Society of Professional Engineers (NSPE) Code of Ethics
- Model essays from previous Statics classes
- Engineering Case Studies Online (Note: Some of these subjects are not appropriate paper topics.)
- Source Use and Plagiarism Policy for the HCTC

FORMAT AND SUBMISSION GUIDELINES
- Title page: Create an original title. Center and double-space. Include one line each for title, your name, course name and section, professor’s name, and due date.
- Length: 1000-1250 words (Note: Both drafts must meet this length to receive full credit.)
- File Name: Last name, First name, Section, Draft/Final (Example: “Smith, Jane, 0BBB, Draft”)
- Submission type: Electronic attachment, through the Canvas assignment module
- File type: .doc or .docx only (no PDFs)

SCHEDULE AND DEADLINES
- Feb. 12: In-class visits by the Hanson Center to introduce the assignment.
- March 13 (Wed.): First Draft due to Canvas by 11:59 p.m.
- Week of March 25: First drafts returned online.
- Feb. 13-March 13 OR March 27-April 24: Attend HCTC appointment. (Note: Because drafts will be under evaluation, appointments scheduled from March 14-March 26 will not count for credit.)
- April 24 (Wed.): Final Paper due to Canvas by 11:59 p.m.
- Week of May 6: Final papers returned online.

Note on appointments: Bring a printed copy of 1) your paper and 2) all feedback received. You must stay the full 25 minutes for credit. You may schedule more than one appointment for your Statics essay.

Late Policy: Late work will not be accepted. Rare exceptions will be made for documented illnesses or emergencies on a case-by-case basis. Further information can be found on the Registrar’s website.

The Hanson Center for Technical Communication
Location: 3307 SC
Appointments: Use our online schedule: https://hanson.mywconline.com
Email: sarah-livesay@uiowa.edu (Dr. Sarah Livesay, Assistant Director)