ESG 201 LEARNING FROM DISASTER – DEC H (REQUIRED)
Credit: 3

COURSE CATALOG DESCRIPTION:
The role of the engineer is to respond to a need by building or creating something along a certain set of guidelines (or specifications) which performs a given function. Just as importantly, that device, plan or creation should perform its function without fail. Everything, however, does eventually fail and, in some cases, fails with catastrophic results. Through discussion and analysis of engineering disasters from nuclear meltdowns to lost spacecraft to stock market crashes, this course will focus on how modern engineers learn from their mistakes in order to create designs that decrease the chance and severity of failure.

PRE- OR COREQUISITE(S): Prerequisite: One D.E.C. category E course

Recommended: Henry Petroski, “To Engineer is Human”, Vintage Books, 1992
Website resources at: www.stonybrook.edu/disaster

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<th>COURSE LEARNING OUTCOMES</th>
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<th>ASSESSMENT TOOLS</th>
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<tr>
<td>Understanding the causes of engineering failure</td>
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<td>Report; presentation</td>
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<td>How engineering failures have resulted in better designs</td>
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<td>Report; portfolio assignment</td>
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<td>Understanding the role of engineering ethics in engineering failures and disasters</td>
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COURSE TOPICS:

Week 1. What is an engineering disaster?
Week 2. Case studies (from antiquity to 1900)
Week 3. Role of the failure analyst; failure modes
Week 4. Case studies from 1900 - 1970
Week 5. Role of materials engineering in understanding failure
Week 6. Modern case studies
Week 7. Modern case studies
Week 8. Midterm report
Week 9. Engineering ethics and ethical problem solving
Week 10. The study of current engineering disasters and failures
Week 11: Research techniques and sources; work on the final project
Week 12: Recent case studies
Week 13: Recent case studies
Week 14: Final presentations
Week 15: Final presentations (continued)
CLASS/ LABORATORY SCHEDULE:

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CURRICULUM:
This course contributes 3 credit hours toward meeting the required 48 hours of engineering topics.

STUDENT OUTCOMES (SCALE 1-3):

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3 – Strongly supported  2 – Supported  1- Minimally supported

LEAD COORDINATOR(S) WHO PREPARED THIS DESCRIPTION AND DATE OF PREPARATION:
Gary Halada, May 19, 2010