ESE 540: Reliability Theory
Syllabus (Spring 2022) 11 14 2021

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Learning Objective: To introduce students to the theory and practice of reliable system design and evaluation. This is a hybrid course, it meets online one hour a week and the rest of the course is asynchronously (view at your convenience) online.

Coverage
    (1) Introduction
    (2) Reliability of Systems and Components
    (3) System Analysis
    (4) Lifetime Distributions
    (5) Repairable Systems
    (6) Warranties
    (7) Software Reliability
    (8) Event and Fault Trees

Text: L. Leemis, Reliability: Probabilistic Models and Statistical Methods, Prentice-Hall, (1st or 2nd edition). Also get a copy (paperback available) of Inviting Disaster by James Chiles.

Grading: Two Self Exams (16 points each), Two Case Study Essays (10 points each), Two Projects (16 points each), Portfolio (16 points).

A is about 90 and above, A- is about 85 to 89, B-,B, B+ is about 70 to 84, passing C is about 65 and above.

Schedule (all Sunday assignments due at midnight Sunday evening):

Week 1 (Jan 24th): Chapters 1-2.

Week 2 (Jan 31st): Chapter 2. **Essay 1 due Sunday Feb. 6th.**

Week 3 (Feb. 7th): Chapter 2.

Week 4 (Feb. 14th): Chapter 2. **Project 1 due Sunday Feb. 20th**

Week 5 (Feb. 21st): Chapter 2.

Week 6 (Feb. 28th): Chapters 3 and 4. **Self-Exam 1 due Sunday March 6th.**

Week 7 (March. 7th): Chapters 3 and 4.

March 14-20th Spring Break

Week 8 (March. 21): Chapter 3 and 4. **Essay 2 due Sunday March 27th.**

Week 9 (March 28th): Chapters 3 and 4. **Project 2 due Sunday April 3rd.**

Week 10 (April 4th): Chapters 3 and 4. **Self-Exam 2 due Sunday April 10th.**

Week 11 (April 11th): Chapter 6.

Week 12 (April 18th): Chapter 6.

Week 13 (April 25th): Special Topics. **Portfolio due Sunday May 1st.**

Week 14 (May 2nd): Special Topics.

Essays: Professor will suggest a topic/chapter – write 500 words on it. Essay should have a sentence or two in the beginning summarizing what you are going to write about. Then several paragraphs developing your argument. It should conclude with a sentence/paragraph presenting the conclusion

Projects: Theses are straightforward software projects. Any language including mathlab can be used but state the language being used. These are 1 person projects. While you may consult with other students the project should be your own. Graphs should look professional with legends along the axis and captions if necessary identifying plots.
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Self-Exam: A self-exam is four questions and answers on the indicated material the student makes up. Questions and answers are graded based on correctness, having a good mix of questions, and clearness of solutions (they should be easy to follow and read).

Portfolio: The portfolio is a collection of five original reliability problems and solutions created by students. No more than two problems from chapter 2. Questions and answers are graded based on correctness, having a good mix of questions and clearness of solutions.

NOTE: For both self-exams and portfolio each question should be followed by its solution. Do not group solutions together. Submit as a single pdf file to Assignments on Blackboard. Can be hand written if neat. Problems selected should be similar in level of difficulty to old exam problems and book problems. Avoid overly complex problems or problems on material not covered in course --- they make me think they were copied from somewhere else.

Note: If you have a physical, psychological, medical or learning disability that may impact on your ability to carry out assigned course work, I would urge you to contact the staff in the Student Accessibility Support Center office 631-632-6748. The staff will review your concerns and determine with you what accommodations are necessary and appropriate. All information and documentation of disability are confidential.