

ESE 540: Reliability Theory
Syllabus (Fall 2020) 7 29 2020

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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 (20 points each), Two Case Study Essays (10 points each), Two Projects (10 points each), Portfolio (20 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 (Aug. 24th): Chapters 1-2.

Week 2 (Aug. 31): Chapter 2. **Essay 1 due Sunday Sept. 6th.**

Week 3 (Sept. 7th): Chapter 2. **Project 1 due Sunday Sept. 13th.**

Week 4 (Sept. 14th): Chapter 2.

Week 5 (Sept 21st): Chapter 2. **Self-Exam 1 due Sunday Sept. 27th.**

Week 6 (Sept, 28th): Chapters 3 and 4.

Week 7 (Oct. 5th): Chapters 3 and 4. **Essay 2 due Sunday Oct. 11th.**

Week 8 (Oct. 12): Chapter 3 and 4. **Project 2 due Sunday Sept. Oct. 18th.**

Week 9 (Oct. 19th): Chapters 3 and 4.

Week 10 (Oct. 26th): Chapters 3 and 4. **Self-Exam 2 due Sunday Nov. 1st.**

Week 11 (Nov. 2nd): Chapter 6.

Week 12 (Nov. 9th): Chapter 6.

Week 13 (Nov. 16th): Special Topics. **Portfolio due Sunday Nov. 29th.**

Week 14 (Nov. 30th): Special Topics.

(see next page)

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: These are straightforward software projects. Any language including matlab 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.

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.*