

Reliability Engineering Management

ENRE 642, Summer 2021

Course Syllabus

Unifying systems perspective of reliability engineering management. Design, development and management of organizations and reliability programs including: management of systems evaluation and test protocols, development of risk management-mitigation processes, and management of functional tasks performed by reliability engineers.

The course has an emphasis on understanding the value of reliability activities within the entire product lifecycle. Case studies of actual organizations focused on determining the key considerations when attempting to improve the organization's ability to produce reliable products.

Course Instructor:

Fred Schenkelberg

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Recommended Text:

Practical Reliability Engineering, 5th Edition, 2012
Patrick D. T. O'Connor and Andrew Kleyner, Wiley

Plus a couple of booklets prepared by the instructor (included with course materials)

Optional References:

Handbook of Reliability Engineering and Management, 2nd Edition 1996
Ireson, W. Grant, Coombs, Clyde F. and Moss, Richard Y., McGraw-Hill

Improving Product Reliability: Strategies and Implementation, 2003
Mark A. Levin and Ted T. Kalal, Wiley

Quality is Free: The Art of Making Quality Certain, 1979
Philip B. Crosby, New American Library

Design Paradigms: Case Histories of Error and Judgment in Engineering, 1994
Henry Petroski, Cambridge University Press

Grading:

Homework 20%

Mid Term 25%

Project 25%

Final 30%

Mid term and final via Canvas

Schedule:

Section 0101 – not happening this year

Lecture/Discussion Sessions MTuWThF 9:00am – 12:00pm and 12:30pm – 3:00pm

Friday, June 1st

Review and Discussion 9:00am – 12:00pm

Midterm 12:30pm – 3:00pm (exam is 2.5 hrs)

First week homework due at start of Midterm

Monday, June 12th Study and Final Day

Office hours 9:30am – 12:00pm by appointment

Project Due at start of final

Final Exam – 12:30pm – 3:00pm

Sections ER01 and RE01 – 6/1/21 thru 8/20/21 **online** only:

Deadline for homework and midterm is by July 2nd 9 pm Pacific Daylight Time

Deadline for project and final is by August 20th, 9 pm Pacific Daylight Time

You may take exams ahead of above schedule. The homework and project are due on date scheduled for midterm or final, respectively, or before.

Course Outline:

Review material in O'Connor and Kleyner, other references are optional.

1. Introduction to Reliability Engineering Management
2. Reliability Value
3. Maturity Matrix
4. Goals and Planning
5. Basic models, environment and use
6. Failure Sources
 - A good spot for midterm and wrap-up homework
7. Identifying risk
8. Best reliability data
9. Basic reliability testing
10. Robust by design
11. Supply chain reliability
12. Building Culture
 - Review, final and projects due

The lectures are prerecorded and immediately available for watching, if you wish.
Or, pace yourself, through the course with a little more one topic per week.

We'll have live Zoom (or something similar) weekly – this time is to address any discuss points brought up in the lectures and/or your questions.

The course has two eBooks, one on Value and the other on Maturity. There also is a short reader available for each of the 12 topics, along with a Next Steps worksheet to encourage additional thinking about the topics covered.