OFFICIAL SYLLABUS
STAT 484 - RELIABILITY ENGINEERING

Adopted - Spring 2010

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Catalog Description: Probabilistic models for the reliability of coherent systems. Statistical models for lifetimes of components and repairable systems. Reliability estimation and prediction. MIL standards. Prerequisite: STAT 480a,b; or IME 365.

Textbook: Reliability: Probabilistic Models and Statistical Methods 2nd edition, by Leemis (ISBN 978-0-692-00027-4)

Course Outline and Topics

Chapter 1 Introduction
- 1.1 Definition of Reliability

Chapter 2 Coherent Systems Analysis
- 2.1 Structure Functions
- 2.2 Minimal Path and Cut Sets
- 2.3 Reliability Functions
- 2.4 System Reliability Bounds

Chapter 3 Lifetime Distributions
- 3.1 Distribution Representations
- 3.2 Discrete Distributions
- 3.3 Moments and Fractiles
- 3.4 System Lifetime Distributions
- 3.5 Distribution Classes

Chapter 4 Parametric Lifetime Models
- 4.1 Parameters
- 4.2 Exponential Distribution
- 4.3 Weibull Distribution
- 4.4 Gamma Distribution
- 4.5 Other Lifetime Distributions

Chapter 6 Repairable Systems
- 6.1 Introduction
- 6.2 Point Processes
- 6.3 Availability

Chapter 7 Lifetime Data Analysis
- 7.1 Point Estimation
- 7.2 Interval Estimation
- 7.3 Likelihood Theory
- 7.4 Asymptotic Properties
- 7.5 Censoring

Chapter 8 Parametric Estimation for Models Without Covariates
- 8.1 Sample Data Sets
- 8.2 Exponential Distribution
- 8.3 Weibull Distribution

Any instructor should cover all of the material specified; additional sections are optional.