

IOE 562/Stat 535: RELIABILITY
Fall 2007
Instructor: Vijay Nair

COURSE DESCRIPTION

This course will cover important reliability concepts and methodology that arise in modeling, assessing and improving product reliability and in analyzing field and warranty data.

Topics will be selected from the following:

- Basic Concepts in Reliability
- Component and System Reliability
 - Aging
 - Hazard
 - Component Reliability
 - Common Models for Component Reliability
- Types of Censoring Schemes
- Analysis of Time-to-Failure Data
 - Nonparametric Techniques
 - Graphical and Formal Goodness-of-Fit Tests for Model Selection
 - Parametric Techniques
- Reliability, Availability, and Maintainability for Repairable Systems
 - System Structures
 - Common Models for System Reliability
 - Analysis of Time-Between-Failure Data
 - Maintenance and Availability
- Accelerated Stress Testing for Reliability Assessment
- Reliability Improvement Through Experimental Design
- Special Topics: Warranty Data Analysis, Stress-Strength Models, etc.

TEXT:

`` *Statistical Methods for Reliability Data*'' by Meeker and Escobar (1998), Wiley.

This will be supplemented by selected material from engineering text books in reliability.

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ADDITIONAL REFERENCES

1. Meeker. W. Q. and Escobar L. (1998) *Statistical Methods for Reliability Data*, New York: Wiley
2. Nelson, W. (1990), *Accelerated Testing: Statistical Models, Test Plans and Data Analyses*, New York: Wiley.
3. Ascher, H. and Fiengold H. (1984), *Repairable Systems Reliability*, New York: Marcell Dekker, Inc.
4. O'Connor, P. D. T. (1985), *Practical Reliability Engineering*, New York: Wiley.
5. Ebeling, C. E. (1997), *Reliability and Maintainability Engineering*, New York: McGraw Hill.
6. Billinton, R. (1992), *Reliability Evaluation of Engineering Systems: Concepts and Techniques*, Plenum Pr. NY.
7. Lewis, E. E. (1996) *Introduction to Reliability Engineering*, New York: Wiley.
8. Jardine, A. K. S. (1973), *Maintenance, Replacement and Reliability*, New York: Wiley
9. Ditlevson, O. and Madsen, H. O. (1996) *Structural Reliability Methods*, New York: Wiley.

GRADING SCHEME

Homework	25%
Midterm	25%
Class Project	15%
Final Exam	25%
Class Participation	10%

Class project will be in teams of 2-3 students.

You can discuss homework problems with your classmates but all work that you turn in must be your own.