TOPICS IN PROBABILITY AND STATISTICS

MATH 8670

Course Description:

A variable topics course in Probability and or Statistics. Topics covered will include one or more of the following: Reliability Theory and applications in Engineering and Science, Advanced Probability and Statistical Models, Theory of Parametric Estimation and applications, and Advanced Probability Theory and application. **3 credits**

Prerequisites:

Math 4740/8746 or Stat 3800/8805 or instructor's permission.

Overview of Content and Purpose of the Course:

The purpose of the course is to offer at least one graduate level course in Probability and Statistics which would be of interest to Mathematicians, Engineers, and Scientists.

Anticipated Audience/Demand:

The course is intended primarily for graduate students in Mathematics, but could also be taken, depending upon the particular offering/topics chosen that semester, by graduate students in Engineering and Science.

Major Topics:

A list of topics will be given for the Reliability Theory and its applications.

a) Introduction to Reliability Theory, Failure Models

b) Lifetime Distributions: Weibull, Gamma, Lognormal, other Distributions

c) Notions of Aging: IFR, IFRA, NBU, NBUE Distributions

d) Coherent Systems, Minimal Path and Cut Sets

e) Non-Repairable Systems, Independent Components

f) Component Importance Measures

g) Bounds on System Reliability

h) Statistical Inference in Life Data Analysis

i) Censored Data/Kaplan Meier Estimator

j) Renewal Processes and Reliability

k) Availability Models, Repairable Systems

l) Accelerated Life-Testing, Stress Strength Models

m) Survival Analysis and Regression Models

n) Multivariate Dependence Models

Methods:

The course will be taught primarily by a class lecture format.

Textbook:

Varies depending on topics.

February 2016