INTRODUCTION TO PROBABILITY & STATISTICS II

MATH 4750/8756

Course Description:

Theory and methods of statistical inference including estimators, statistical hypotheses, multivariate estimation, chi-square tests, linear models, analysis of variance, and statistical software. **3 credits**

Prerequisites:

MATH 4740/8746

Overview of Content and Purpose of the Course:

The student should gain a solid foundation in the following fields of statistical inference: significance tests, point estimation, and confidence intervals.

Major Topics:

1. Estimation
- a) Maximum likelihood estimators
- b) Unbiased estimators
- c) Minimum variance estimators
- d) Sufficient statistics

2. Tests of Statistical Hypotheses
- a) Tests of variances and differences of means
- b) Power
- c) Test for randomness
- d) Kolmogorov-Smirnov goodness of fit test

3. Multivariate Distributions
- a) Correlation coefficient
- b) Conditional distributions
- c) Bivariate normal distribution

4. Chi-square Test of Models

5. Linear Models

6. Analysis of Variance

7. Statistical Software

Methods:

The course will be presented by lecture, class discussion and questions. To receive graduate credit for this course, a student must do work not required of undergraduates. To meet this requirement the graduate students will be assigned more difficult homework and/ or computer projects than the undergraduate students

Textbook:

Miller, M. Miller. *John Freund's Mathematical Statistics, 8th ed*. Upper Saddle River: Prentice Hall, 2014.

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