Math 4614 – 6614: Introduction to Probability and Statistics (Spring 2015)

Class: MWF   Room: DH 225   Time: 11.30 AM – 12.25 PM

Textbook: Probability and Statistical Inference by Hogg, Tanis, and Zimmerman, **9**[th] **Edition, Pearson Publishers, ISBN: 978-0-321-92327-1**

Material: Chapter 1-8 (with a few sections skipped)
Instructor: Manohar Aggarwal;   **Office Room #:** 386 Dunn Hall
Email: maggarwl@memphis.edu ; **Office Hours: MW: 1.30 PM to 2.30 PM** (**or by appointment**)
Course Objectives

The objective of this course is to introduce to students the basic theory of probability and statistics, which is fundamentally important for understanding commonly used statistical concepts and methods relevant to computer science. This course also provides a necessary basis for a further study of advanced statistical courses. No previous familiarity with probability or statistics is assumed. However, it is expected that the students have **calculus background**.
It is suggested that the students should carefully read the (i) text, preferably ahead or just after the lecture, (ii) class lecture notes, (iii) timely submit the homework assignments, and (iv) try to read solutions to HW assignments.

Topics to be covered:
Probability: Sample Space and Events, Properties of Probability, Methods of Enumeration, Conditional Probabilities, Independent Events, Bayes' Theorem.

Random Variables: Discrete and Continuous random variables, Cumulative Distribution Function, Expectation, Mean and Variance, moment generating function.

Discrete Distributions: Uniform, Binomial, Poisson, Geometric, Negative Binomial, Hypergeometric.

Continuous Distributions: Uniform, Exponential, Gamma, Chi-Square, Normal.

Bivariate Distributions: Distribution of two random variables, covariance and correlation, conditional and marginal distributions.

Sampling Distributions: Distribution of function of random variables, random variables associated with normal distribution. t and F distributions. Central Limit Theorem.

Estimation: The Likelihood function, maximum likelihood estimation, confidence interval estimation.

Hypothesis Testing: Tests of hypotheses about mean, proportion, and variance.

Linear Models: Multiple Linear Regression, Analysis of Variance.

Grades: The grades will be based on homework (15%), four in-class tests (15% each), and the comprehensive final (40%), **with the lowest in-test score dropped**.

Make ups: No make-ups will be given**. Instead, the lowest in-class test grade will be dropped.**

Grades will be determined as follows:

A: 90-100; B: 80-89; C: 70-79; D: 60-69; Below 60%- F

Homework: Homework will be announced in the class and is to be submitted on or before the **due date.**

Note: **Late homework will not be accepted.**

An additional homework assignment will be given to students at the 6000 level.

Tutoring: If you need help in the course, please do not hesitate to contact me during my office hours or at other time by appointment. Free tutoring help is also available through the Educational Support Program (ESP) in Dunn Hall room 143.

Attendance: Compulsory

There will be opportunities to earn bonus points based on your attendance. You will get **3 bonus** points if you have not been absent on any day or have been absent **only for one day during the whole semeste**r. You will get **2 bonus points** if you have been **absent only for two days or three day**s during the whole semester. **YOU MUST STAY FOR THE ENTIRE CLASS PERIOD TO BE ELIGIBLE FOR ANY BONUS POINTS.**

Exam Schedule:

Test 1: Wednesday, February 11, 2015
Test-2: Wednesday, March 4, 2015
Test-3: Wednesday, April 1, 2015
Test-4: Wednesday, April 22, 2015
Final Exam: Monday, May 4, 2015, 10.30 AM to 12.30 PM