



## STATISTICS 490-3

### Selected Topics in Probability and Statistics: Problems in Applied Probability

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Fall 2003

DAY COURSE

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**Instructor: Dr. D. MURAKI (SSC K 10538)**

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#### **Prerequisite:**

Two of MATH 310, MACM 316 or Stat 280 or instructor's permission.

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#### **Textbook:**

*Introduction to Probability Models* (8th Edition) by Sheldon Ross, Harcourt Academic Press

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#### **Calendar Description:**

Topic in areas of probability and statistics not covered in the regular curriculum of the department.

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#### **Outline:**

For many real-world processes, like financial market prices, molecular motion and weather patterns, seemingly random fluctuations are intrinsic to the observed behaviour. Understanding the uncertainty in such systems requires a knowledge of the probabilities by which they are ruled, and the statistics by which we can measure them. The plan for this course is to introduce the basic mathematical tools for quantifying the probabilities and statistics for random systems, and to apply these ideas to models with uncertainty. Computational approaches to random situations and parameter estimation will play a prominent role in the lectures and assignments.

The first part of the term will be an introduction to the mathematics of probability, and the statistics of randomness. The second part of the term will focus on specific problems, and their analysis using probabilistic and statistical methodologies. Assignments will be problem-based, and also require some use of the Mat lab computing environment. Possible special topics are: queuing theory, stochastic differential equations, and data assimilation.

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#### **Tentative Grading**

Homework - 45%

Midterm - 25%

Final Exam/Project - 30%

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*Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required by all members of the University. Please consult the General Guidelines for details.*

Revised June 2003