MAT 516 PROBABILITY AND STATISTICS FOR TEACHERS SYLLABUS

The objectives of the course are that students should:

- understand basic combinatorics and be able to apply them to standard problems: e.g., coin tossing, throwing dice, drawing cards, Bose-Einstein versus Fermi-Dirac statistics.

- be able to use Stirling's formula to evaluate binomial or multinomial coefficients.

- understand the basic formalism of probability theory: mutually exclusive versus independent events, inclusion-exclusion principle, random variables; be able to analyze problems in those terms.

- understand distribution functions and densities (mass distributions); be able to calculate expectation, variance, standard deviation.

- understand independence of random variables, and the joint and marginal distributions of two random variables; be able to calculate covariance and correlation.

- be familiar with the basic discrete distributions: Bernoulli, binomial, Poisson, geometric, negative binomial, hypergeometric; be able to calculate their expectation and standard deviation.

- be familiar with the basic continuous distributions: uniform, normal, exponential, gamma, beta; be able to calculate their expectation and standard deviation.

- understand Poisson processes, and the sense in which some distributions above are limiting cases of others when some parameters are small or large; be able to use this to make approximations.

- understand the concept of conditional probability and expectation; be able to compute using Bayes' formula and it's many applications.

- understand the weak and strong law of large numbers, higher moments, the expectation and variance of sums of independent identically distributed random variables; be able to give at least the statement and interpretation of the central limit theorem, and to calculate with it in simple examples.

- demonstrate knowledge of the historical development of probability and statistics, including contributions from diverse cultures.

INSTRUCTOR: Professor C. Denson Hill, Office 2-113 Math Tower.
Office Hours: Monday 1:30-2:30 & 5:30-6:30 and Wednesday 1:30-2:30.

TEXTBOOK: Saeed Ghahramani, Fundamentals of Probability w/Stochastic Processes, Pearson
9780131453401

GRADING POLICY: Homework will be assigned each week, to be handed in and graded. The final exam will be in two parts: Part I on Monday, Oct 10, & Part II on Monday, Nov 28. Each part of the final exam will count 30 %, and the homework will count 40 %.

The specific homework assignments will be assigned each week, to be handed in the next week.

Disability Support Services (DSS):

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room 128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.
Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: http://www.stonybrook.edu/ehs/fire/disabilities

Academic Integrity:

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html

Critical Incident Management

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn.