SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
SYLLABUS (Tentative)
MATH 413/513 Mathematical Statistics I

Objectives: To learn how to construct and use probability models with an emphasis on proofs, formal reasoning and communicating mathematics in writing. In particular, introduce how probability models support the theory of statistical inference.

Intended for: Students in Mathematics or Physical Sciences.

Prerequisite: MATH 213, MATH 210 and MATH 310.

Text: "Introduction to Probability and Mathematical Statistics," by Bain and Engelhardt; The Duxbury Advanced Series in Statistics and Decision Sciences, 2nd edition, 1992, ISBN: 9780534380205.

	Hours
Introduction to Probability	12.0
Set theory; Notation, terminology, and definition of probability; Properties of probability; counting techniques; Conditional probability; independence; Bayes theorem.	
Random Variables and Distributions	10.0
Discrete distributions, continuous distributions; Expected value, variance, covariance and their properties; Moment generating function (MGF).	
Special Distributions	10.0
Binomial, hypergeometric, Poisson, negative binomial, exponential, normal, gamma, beta distributions; deriving MGF's, finding mean and variance for each, exploring connections among these distributions.	
Joint Distributions	11.0
Definitions of joint discrete and continuous distributions, independent random variables, marginal and conditional distributions, conditional expected value and variance, correlation; joint MGF.	
Functions of Random Variables	5.0
The CDF technique, transformation of random variables, sums of random variables; order statistics.	
Limiting Distributions	5.0
Definition of limiting distributions, Proof(s) of Central Limit Theorem; Asymptotic normal distributions.	
Tests	3.0
Total	56.0

*Graduate students will be assigned special homework/test problems or projects.
NOTE: ONCE A STUDENT HAS RECEIVED CREDIT, INCLUDING TRANSFER CREDIT, FOR A COURSE, CREDIT MAY NOT BE RECEIVED FOR ANY COURSE WITH MATERIAL THAT IS EQUIVALENT TO IT OR IS A PREREQUISITE FOR IT.

HOMEWORK: Homework is essential for your success in this course. Students are expected to spend approximately 6-8 hours per week reading the text and doing problems. Homework will be assigned, collected and graded weekly. Students are expected to work on the assigned problems individually and independently from each other.

QUIZZES AND TESTS: There will be weekly quizzes (15 minutes) and three midterm tests (50 minutes). There is no make-up for quizzes, but two lowest quiz scores will be dropped when determining course grade. If a student is absent for a quiz, the missed quiz becomes dropped score. All tests must be taken. Only in the event of an unavoidable emergency will a make-up exam be considered. It is possible to take a test before its scheduled time if student informs instructor ahead of time. Students who miss a test must contact instructor immediately to arrange a make-up test, which might be more difficult.

WRITING ACROSS THE CURRICULUM: Writing is a tool used throughout mathematics and its applications for Learning and Communicating. Correct grammar, spelling, and use of the English language will be taken into consideration when grading homework assignments. At the University Writing Center at Herb's Place (Guerrieri University Center, room 213), trained consultants are ready to help you at any stage of the writing process. It is often helpful for writers to share their work with an attentive reader. Consultations allow writers to test and refine their ideas before having to hand papers in or to release documents to the public. In addition to the important writing instruction that occurs in the classroom and during office hours, the center offers another site for learning about writing. All undergraduates are encouraged to make use of this important student service. For more information about the writing center's hours and policies, visit the writing center or its website.

GRADING SCALE: GRADES:

90%-100%	A		Quizzes (two lowest dropped)	15%
80%-89.9%	B		Homework	15%
70%-79.9%	C		Tests	40%
60%-69.9%	D		Final Exam	30%
0%-59.9%	F			

Accommodations:
Any student who feels that they may require an accommodation in this course, based on the impact of a disability, should contact the instructor as soon as possible to arrange for a meeting to coordinate any and all accommodations. Any student who wishes to contact the Office of Student Disability Support Services, for further information, should do so by calling 410-677-6536 (Voice) or 410-543-6083 (TTY); emailing disabilityservices@salisbury.edu; or visiting Guerrieri University Center, Room 242.