

SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

SYLLABUS (*Tentative*)

MATH 493/593 *Advanced Topics in Statistics: Stochastic Calculus with Financial Applications*

**INTENDED FOR:** Students considering employment in areas of statistics, actuarial science or applied mathematics.

**OBJECTIVES:** To gain knowledge of stochastic calculus, stochastic differential equations and some applications.

**PREREQUISITE:** At least one course in inferential statistics with a “C” or better (MATH 151, 155, 213, 216 or equivalent) and MATH 202.

**TEXTBOOK:** “Introduction to Stochastic Calculus with Applications” by Fima Klebaner, 3<sup>rd</sup> Edition. ISBN: 978-1848168329.

			<i>Hours</i>
Chapter 1	<i>Review of some Calculus topics</i>	8.0	
Chapter 2	<i>Concepts of Probability Theory</i>	6.0	
Chapter 3	<i>Basic Stochastic Processes</i>	8.0	
Chapter 4	<i>Brownian Motion Calculus</i>	8.0	
Chapter 5	<i>Stochastic Differential Equation</i>	8.0	
Chapter 6	<i>Diffusion Processes</i>	8.0	
Chapter 12	<i>Applications in Finance</i>	8.0	
	<b><i>Tests</i></b>		<u>2.0</u>
			56.0

**EVALUATION**

Homework, Quizzes, Projects	25%
Tests	50%
Final	25%

**Writing Across the Curriculum**

*Writing will be a large component of this course. All written projects must be accompanied by clearly written explanations and interpretations.*

The problem sets/projects will require graduate students to exhibit integrative thinking, synthesis, and analysis on material beyond the level usually expected of undergraduates.