

Salisbury University Department of Mathematical Sciences

MATH 493/593 : Advanced Topics in Statistics: Stochastic Calculus with Financial Applications
Syllabus (Tentative)

Description: Study in specialized areas of statistics such as time series, stochastic processes, quality control designs and analyses or other topics suggested by faculty or students. 4 Hours Credit: Meets four hours per week.

Prerequisites: C or better in MATH 213 or MATH 216, and permission of instructor. May be repeated once under different subtitles.

Intended Audience: Students considering employment in areas of statistics, actuarial science or applied mathematics.

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

Textbooks: *Introduction to Stochastic Calculus with Applications*, by Fima Klebaner, 3rd Edition. ISBN: 978-1848168329.

| Topic | Weeks |
|---|-----------|
| Chapter 1: Review of some Calculus topics | 2 |
| Chapter 2: Concepts of Probability Theory | 1.5 |
| Chapter 3: Basic Stochastic Processes | 2 |
| Chapter 4: Brownian Motion Calculus | 2 |
| Chapter 5: Stochastic Differential Equation | 2 |
| Chapter 6: Diffusion Processes | 2 |
| Chapter 12: Applications in Finance | 2 |
| Tests | 0.5 |
| Total | 14 |

Evaluation

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

- Graduate students will be assigned special homework/test problems or projects.
- Clear descriptions of thought processes, evidence of critical thinking, and effective communication must be demonstrated in written work.
- **Writing Across the Curriculum:** Students will be expected to communicate mathematics and mathematical ideas effectively in speech and writing. At the University Writing Center, trained consultants are ready to help you at any stage of the writing process. In addition to the important writing instruction that occurs in the classroom and during professors' office hours, the Center offers another site for learning about writing. **All students are encouraged to make use of these important services.**
- **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.