MAT 265/Introduction to Financial Mathematics Program Cover Document

I. **Basic Course Information**

Undergraduate Bulletin course description: "An introduction to mathematical and numerical models used to price financial securities and make risk estimates. Topics include time value of money, annuities and cash flows, loans, bonds, general cash flows and portfolios, immunization, derivatives, options, swaps, and hedging and investment strategies."

MAT 265 is a course for students interested in understanding how mathematical models are used in financial and actuarial work. The course is graded and will meet for two eighty-minute class periods per week. Prerequisite: MAT 128: Calculus B.

II. **Learning goals**

MAT 265: Introduction to Financial Mathematics will provide students with an introduction to the mathematical and numerical models used to price financial securities and to make risk estimates. The field of mathematical finance is a modern subfield of probability theory aimed at developing methods to make decisions in the face of uncertainty in financial markets. This field is central to the development of modern financial instruments in the economic markets. A central example is the 1973 Black-Scholes model for financial derivatives, for which Black and Scholes were awarded the 1997 Nobel Prize in Economics.

The primary learning goals of the course are to 1) introduce students to the concepts in financial mathematics; 2) introduce students to financial instruments as they relate to financial mathematics 3) introduce students to the use of mathematical models for financial products; 4) develop student abilities to create and apply mathematical models. The specific content goals contained in items (1), (2) are: the concepts of fixed income, equities, and financial derivative products; the time value of money; compound interest; annuities; cash flows; loan concepts and amortization; mathematics of fixed income products; portfolios; and immunization.

MAT 265 should appeal to students interested in pursuing advanced studies and careers in finance, financial mathematics, and actuarial science. The MAT 265 course will provide these students with both theoretical knowledge, and experience with actual case studies of applications of mathematical finance. In addition, this course will ensure that the students have a solid foundation necessary to pass the actuarial FM/2:Financial

Mathematics examination.

III. **Student assessment**

Student work will be the primary measure to assess how well students meet the learning goals of MAT 265. A combination of homework sets, quizzes, and tests throughout the course will be given to assess student progress. A secondary measure will be the success rate of students taking the FM/2: Financial Mathematics examination.

IV. **Learning activities**

The specific choices of learning activities will depend upon the instructor. It is expected that they will consist of some combination of lectures, group work, student presentations, individual homework, computer assignments, quizzes, tests and a final exam.

Approved: 11-19-2025