Theory of Interest, Math 618

- **Rationale**

  Math 618 is designed to introduce students to the mathematical content of the theory of interests. The course includes material from the new Exam FM of the Society of Actuaries (SOA) and the Casualty Actuarial Society (CAS). The course is required for the undergraduate major in actuarial science.

  SOA and CAS recently enlarged Exam FM. New material on financial derivatives and its use in risk management, and the concept of arbitrage is added. To reflect this change in Exam FM, the number of credits of Math 618 needs to be increased from 3-credit to 4-credit in order to cover the new material.

- **Prerequisite**

  Mathematics 254 or permission of instructor.

- **Texts**

  Mathematics of Investment and Credit, 3rd Ed., Samuel A. Broverman, AcTeX 2004
  Derivatives Markets, 2nd Ed., Robert L. McDonald, Addison Wesley, 2006.

- **Syllabus**

Week 1	Interest Accumulation, Effective Rates, Present Value and Equations of Value, Nominal Rates
Week 2	Effective and Nominal Rates of Discount, Force of Interest, Level Payment Annuities
Week 3	Level Payment Annuities Generalizations, Non-Constant Payment Annuities
Week 4	Annuity Applications and Illustrations, Amortization Method of Loan Payment
Week 5	Sinking Fund Method, Bond Prices, Amortization of a Bond, Applications and Illustrations
Week 6	IRR, Dollar- and Time-Weighted Rate of Return, Applications and Illustrations, Term Structure of Interest
Week 7	Term Structure of Interest (cont.), Duration
Week 8	Asset-Liability Matching and Immunization, Introduction to Derivatives
Week 9	Forwards and Options, Insurance, Collars, and Other Strategies
Week 10	Risk Management, Forwards, Futures, and Swaps

- **Grade**

  Two midterms at 100 points each, and a final exam at 200 points. The course grade is based on the total 400 points.

- **Disability Statement**

  Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in f 50 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901;
  `http://www.ods.ohio-state.edu`.

- **Academic Misconduct Statement**

  It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but riot limited to, cases of plagiarism arid dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee. For additional information, see the Code of Student Conduct
  (`http://studentaffairs.osu.edu/resource-csc.asp`).