

Math 294      Actuarial Mathematics      Spring 2015

**Class Meeting:** MWF 10:20 am - 11:30 am PPHAC 232

**Instructor:** Nathan Shank

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**Office Location:** PPHAC 219

**Office Hours:** Wednesday 9:15 - 10:15, Thursday 1:15 - 2:15, Friday 11:30 - 1:00. Other times by appointment.

**Text:** *Mathematics of Investment and Credit*, Broverman, Fifth Edition, ACTEX Academic Series.

*Derivatives Markets*, McDonald, Third Edition, Pearson.

**Course Goals:** After completing the course, successful students will

- learn problem solving techniques related to financial mathematics.
- have an understanding of the mathematical theory of interest.
- learn tools in and become familiar with measurement of interest, accumulated and present value factors, annuities, yield rates, amortization schedules, sinking funds, bonds, depreciation, yield curves, spot rates, and immunization.
- have an understanding of the theory and mathematics behind derivative markets, call and put options, hedging, arbitrage and swaps.
- be prepared for the Actuarial Exam FM.

**Course Topics:** We will cover the two texts simultaneously. In *Derivatives Markets* we will cover most of chapters 1-5 and 8. This includes an introduction to financial markets, derivatives and risk management. We will also learn about forward contracts, call and put options, spreads and collars, forward contracts, futures contracts, and swaps. In *Mathematics of Investment and Credit* we will cover most of chapters 1 - 8. This includes an introduction to interest, valuation and annuities, loan payments, bond valuation, depreciation, amortization schedules and other topics related to the theory of interest.

### Assignments/Assessment:

- Homework: Homework will be collected every week throughout the semester. A new homework assignment will be given each week and due the following week. Your homework grade will consist of mostly of problems from the Broverman text.
- Group Lessons: Each student will be required to present two chapters of the McDonald text. These “group lessons” will be taught to the entire class. Homework will be assigned, collected, and graded by the presenter for that topic. See the attached schedule for a list of material which will be covered in the group lessons. Your grade will be determined by the homework and your lessons.
- Group Work: There will be several days throughout the semester where you will be required to work as a group on a small project. These projects will be graded based on completeness and each person will receive a grade based on their contribution.
- Tests and Final Exam: You will have **two** tests and a cumulative final exam. The tests are tentatively scheduled for Friday, February 27 and Friday, April 17. The final exam is scheduled for Tuesday May 5, at 1:30 pm. The in class tests and final exam will most likely contain a portion which is multiple choice, similar to the Actuarial Exam FM.

**Grading:** You are responsible to keep track of your own grade. Grades will be computed as follows:

|               |          |
|---------------|----------|
| Homework      | 25%      |
| Group Lessons | 10%      |
| Group Work    | 10%      |
| Test          | 15% each |
| Final Exam    | 25%      |

**Class Structure:** Class time will be mostly discussion based with periodic lectures and presentations.

**Attendance:** Attendance will be taken everyday. There is a very strong correlation between attendance and grades. In order to understand the material, you need to be present in class. Group work also requires every ones participation. Remember that no late homework is accepted.

**Academic Honesty:** For graded homework assignments and projects, you may use your class notes and any books or library sources except a solutions manual. Any resources you use must be documented at the top of the homework assignment. As an example if you get help from the Tutor Center for problem 4 only, please write "Help with problem 4 from Tutor Center". No points will be deducted for honestly acknowledging help. However if you do not document any appropriate resource this is considered cheating.

The College academic honesty policy appears in your Student Handbook; you are expected to be familiar with it. The Academic Honesty Policy Guidelines specific to mathematics classes are reiterated at the end of the syllabus. They apply to work done outside of class as well as to in-class quizzes and tests. Please read them carefully. If you are unsure about the propriety of a particular procedure or approach, please consult with your instructor before continuing with the assignment.

**Special Accommodations:** Students who wish to request accommodations in this class for a disability should contact Ms. Elaine Mara, Assistant Director of Academic and Disability Support, located on the first floor of Monocacy Hall (extension 1401). Accommodations cannot be provided until authorization is received from the Academic and Disability Support office.

### **Academic Honesty Policy Guidelines Mathematics Courses**

The Department of Mathematics and Computer Science supports and is governed by the Academic Honesty Policy of Moravian College as stated in the Moravian College Students Handbook. The following statements will help clarify the policies of members of the Mathematics faculty.

In all homework assignments which are to be graded, you may use your class notes and any books or library sources. When you use the ideas or thought of others, however, you must acknowledge the source. For graded homework assignments, you may not use a solution manual or the help, orally or in written form, of an individual other than your instructor. If you receive help

from anyone other than your instructor or if you fail to reference your sources you will be violating the Academic Honesty Policy of Moravian College. For homework which is not to be graded, if you choose, you may work with your fellow students. You are responsible for understanding and being able to explain the solution of all assigned problems, both graded and ungraded.

All in-class or take home tests and quizzes are to be completed by you alone without the aid of books, study sheets or formula sheets unless specifically allowed by your instructor for a particular test.