

# MA 105 Mathematics of Finance Syllabi

Marilyn McCollum

## MA 105 Mathematics of Finance

### Course Justification:

Upon leaving the university, many students will buy a car, a home, or other items on time; borrow money; and take out life insurance. Many will seek a second income by putting savings in bonds, stocks, or other investments. A knowledge of the mathematics of finance will enable them to borrow or invest more wisely. MA 105 has been developed to provide this knowledge to a wide variety of NCSU students, ranging from the mathematics education major, who very likely will be called upon to teach some type of “consumer mathematics” at the secondary level, to the humanities major who enrolls in the course to gain a little insight into the mathematics involved in various aspects of personal finance. This course also serves as a mathematics elective for students in curricula not requiring calculus.

### Proposed Revisions :

The proposed revision is the creation of new learning outcomes and means of assessing those outcomes to meet the new GER requirements as set forth by the CUE.

### Enrollment For Past Five Years :

Spring 1999	209
Summer 1 1999	36
Summer 2 1999	32
Fall 1999	164
Spring 2000	234
Summer 1 2000	48
Summer 2 2000	36
Fall 2000	176
Spring 2001	236
Summer 1 2001	46
Summer 2 2001	37
Fall 2001	183
Spring 2002	262
Summer 1 2002	49
Summer 2 2002	90
Fall 2002	211
Spring 2003	239
Summer 1 2003	46
Summer 2 2003	50

**Resources Statement:**

N/A

**Consultation with other Departments:**

N/A

**Objectives:**

1. Improve and refine mathematical problem-solving abilities
2. Develop logical reasoning skills

**Course Learning Outcomes: MA 105**

1. Students will be able to solve time value of money problems with respect to simple interest, bank discount, and compound interest rates.
2. Students will be able to make accurate comparisons of financial opportunities and justify mathematically the value of the best opportunity in terms of today's money.

**Evaluation Instruments for Assessing Course Learning Outcomes: MA 105**

- B. On a test, students will solve the following problem: Mack signs a note promising to pay John \$1000 in 3 years at an annual interest rate of 12% compounded monthly. However, 5 months before the note matures, John sells the note to a local bank which discounts the note based on a bank discount rate of 18%. What are the proceeds John receives from the sale of the note to the bank?
- C. On a test, a student will be asked to solve the following problem: A consumer can purchase a TV by paying \$450 cash. However, the consumer can choose to pay \$75 down today and \$18 at the end of each month for 2 years. If money is worth 7% compounded monthly to the consumer, which is the better opportunity for this consumer and by how much today?

**SYLLABI**

- A. Instructor :  
Office :  
Phone :  
E-mail :  
Class days and time:  
Office hours:

- D. Course Prerequisites: MA 101 or equivalent completed in high school

E. Designation of course:

1. GER Category: Mathematics
2. GER Objectives:
  - a. Improve and refine mathematical problem-solving abilities
  - b. Develop logical reasoning skills
3. Student Learning Outcomes:
  - a. Solve time value of money problems with respect to simple interest, bank discount, and compound interest rates
  - b. Make accurate comparisons of financial opportunities and justify mathematically the value of the best opportunity in terms of today's money

- D. a. Text: *Mathematics of Finance, copyright 2000* by Marilyn McCollum  
This text is available only at NCSU Bookstore. Price is approximately \$12.
- b. Each student will need to purchase a business calculator. The instructor will use the HP 10B. The cost is approximately \$30 and is available in the NCSU Bookstore as well as other places.

F. Topics Covered and approximate times:

1. Simple Interest: 2 weeks
2. Bank Discount: 2 weeks
3. Compound Interest: 3 weeks
4. Ordinary Annuities: 3 weeks
5. Other Annuities: 2 weeks
6. Amortization and sinking funds: 2 weeks
7. Perpetuities and capitalized cost: 1 week

E. Test Dates: Test 1:

Test 2:

Test 3:

Test 4:

Final Exam: Covers entire course

(The exam grade will replace the lowest one test grade, if higher. Basically this is a curve for those who master previously missed concepts.)

Homework: Submitted over the Internet via WebAssign. All assignments and exact due dates are stated with each assignment: <http://webassign.ncsu.edu>

Make-up policy (University): All anticipated absences must be excused in advance of the test date and a make-up test scheduled if possible in advance of the absence. These include University duties or trips (certified by an appropriate faculty or staff member), required court attendance (certified by the Clerk of Court), or religious observances (certified by the Department of Student Development--515-2441).

Emergency absences must be reported within one week of returning to class and must be appropriately documented (illness by an attending physician or family emergencies by Student Development). No other make-ups will be given. It is not wise to miss a test.

F. Final Average:

50% Tests

25% Final Exam

25% WebAssign.

Grading Scale:  $90 \leq A \leq 100$

$80 = B < 90$

$70 \leq C < 80$

$60 \leq D < 70$

$F < 60$

The plus/minus grades are based on 2 points at either end of the range. For example, an 88 average is a B+, while a 62 average is a D-.

G. Incomplete grades or WebAssign extensions are given only in extreme circumstances.

H. Attendance: Attendance is taken each class period. There is no distinction between excused and unexcused absences except in the event of a missed test. Students with 4 or fewer absences (excused or unexcused) may have their lowest test grade dropped following any final exam replacement grade.

I Code of Student Conduct will be upheld. Documentation will be submitted to the Office of Student Conduce for students who violate University regulations on academic integrity. [http://www2.ncsu.edu/ncsu/stud\\_affairs/policies/code95.html](http://www2.ncsu.edu/ncsu/stud_affairs/policies/code95.html) On each test, students will write and sign the honor pledge, *I did not give nor receive unauthorized aid on this test.*

J. Students with disabilities: Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 515-7653.

[http://www.ncsu.edu/provost/offices/arrirm\\_action/dss](http://www.ncsu.edu/provost/offices/arrirm_action/dss)

For more information on NCSU's policy, see Academic Accommodations for Students with Disabilities Regulation.

K. Corrections to the grading: If a student feels that an error was made in the grading of a test, present and explain the error in writing to the instructor within 2 class periods after the test is returned. Do not alter the original work.

L. Students must take responsibility for their learning and seek help when needed. Communication with the instructor is essential to your success. We want to help. The Multi-media Center (HA 244) has video taped lectures of MA 105 as well as tutoring on a limited basis.