

THE SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY  
SAULT STE MARIE, ON



COURSE OUTLINE

Course Title: Mathematics of Finance

Code No.: MTH114-4

Semester: One

Program: Business - General Accounting

Author: The Mathematics Department

Date: August 2001 Previous Outline Dated: August 2000

Approved: \_\_\_\_\_  
Dean Date

Total Credits: 4 Prerequisite(s):

Length of Course: 4 hrs./week Total Credit Hours: 64

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## **I. COURSE DESCRIPTION:**

This course develops the students' skills in computation of financial problems relating to business, in using interest formulae, and in forming accurate answers.

This course are, first, to show that the mathematics does play a most important role in the development and understanding of the various fields of business and, second, to ensure that students acquire the mathematical and critical thinking skills necessary to analyze and solve business problems.

## **II. LEARNING OUTCOMES**

### **A. Learning Outcomes:**

Upon successful completion of this course, students will demonstrate the ability to:

#### **Topic 1:**

1. Construct time diagrams to assist in problem solving.
2. Manipulate the simple interest formulae to find the exact simple interest, principal, rate, time, or maturity value.
3. Compute equivalent values for specified focal dates.
4. Understand the terms related to a promissory note.
5. Determine the maturity value of promissory notes.
6. Discount promissory notes using simple discount.

#### **Topic 2:**

1. Use the compound formula to compute future values.
2. Use the present value formula to compute present values.
3. Solve problems involving the use of equations of value.
4. Find the compound amount and discounted values for fractional compounding periods.
5. Compute nominal and effective interest rates, and number of conversion periods.
6. Find equated dates, equivalent rates and solve problems involving continuous compounding.

#### **Topic 3:**

1. Compute the amount and present value of ordinary simple annuities.
2. Compute the amount and present value of ordinary general annuities.

**II. LEARNING OUTCOMES (Continued):****Topic 4:**

1. Compute the amount and present value of simple annuities due.
2. Compute the amount and present value of general annuities due.
3. Compute the present value for deferred annuities.
4. Determine present value of deferred general annuities.
5. Find the present value of simple perpetuities.
6. Determine the present value of general perpetuities.
7. Find the periodic rent, term, and interest rate of ordinary annuities.
8. Find the periodic rent, term, and interest rate of annuities due.

**Topic 5:**

1. Construct amortization schedules.
2. Make computations associated with amortization of debts to determine the periodic payments and outstanding balance.

**Topic 6:**

1. Determine the purchase price of bonds bought on or between interest dates.
2. Determine the premium or discount on the purchase of a bond.
3. Calculate the yield rate for bonds purchased on the market.
4. Construct sinking fund schedules.
5. Make computations associated with sinking funds to determine the periodic payments and accumulated balance.

**III. TOPICS:**

<b>Topics to be Covered</b>	<b>Approximate Time Frame</b>
1. Simple Interest and Promissory Notes	12 hours
2. Compound Interest	14 hours
3. Ordinary Annuities	8 hours
4. Other Annuities	14 hours
5. Amortization	6 hours
6. Bond Valuation and Sinking Funds	10 hours

**IV. LEARNING ACTIVITIES**

TOPIC NUMBER	NO. OF PERIODS	TOPIC DESCRIPTION	REFERENCE CHAPTER ASSIGNMENTS
1	12	Simple interest, graphical presentations, promissory notes, simple and bank discount	Chapters 1 and 2 pp. 1 - 78
2	14	Compound interest – amount and present value, discounting promissory notes, special problems	Chapters 3 and 4 pp. 80 - 171
3	8	Ordinary simple annuities Ordinary general annuities	Chapter 5 pp. 172 - 215
4	14	Simple and general annuities due, simple and general deferred annuities, perpetuities, finding periodic payments and term	Chapters 6 and 7 pp. 216 - 311
5	6	Amortization, simple and general, final payment	Chapter 8 pp. 312 - 369
6	10	Bonds – purchase price, premium discount, schedules and yield rates. Sinking fund schedules	Chapter 9 pp. 370 - 432

**V. REQUIRED RESOURCES / TEXTS / MATERIALS:**

1. Textbook: Mathematics of Finance, S. A. Hummelbrunner. (4th Edition) Prentice Hall
2. Calculator: (*Recommended*) SHARP Scientific Calculator EL-531G. The use of some kinds of calculators may be restricted during tests.

**VI. EVALUATION PROCESS/GRADING SYSTEM:****MAJOR ASSIGNMENTS AND TESTS**

While regular tests will normally be scheduled and announced beforehand, there may be an unannounced test on current work at any time. Such tests, at the discretion of the instructor, may be used for up to **30%** of the overall mark.

At the discretion of the instructor, there may be a mid-term exam and there may be a final exam, each of which can contribute up to **30%** of the overall mark.

**VI. EVALUATION PROCESS/GRADING SYSTEM (continued):**

The instructor will provide you with evaluation information for your class section. Tests may be scheduled out of regular class time.

**ATTENDANCE**

It is your responsibility to attend all classes during the semester. Research indicates there is a high correlation between attendance and student success.

If you are absent from class, it is your responsibility to find out what work was covered and assigned and to complete this work before the next class. Your absence indicates your acceptance of this responsibility.

**Unexcused absence from a test may result in a mark of zero (“0”).** Absence may be excused on compassionate grounds such as verified illness or bereavement. On return from an excused absence, you should ask your instructor to schedule the writing of a make-up test. Failure to do so will be considered as an unexcused absence.

**METHOD OF ASSESSMENT (GRADING METHOD)**

A+	Consistently outstanding	(90% - 100%)
A	Outstanding Achievement	(80% - 89%)
B	Consistently above average achievement	(70% - 79%)
C	Satisfactory or acceptable achievement	
	in all areas subject to assessment	(60% - 69%)
X or R	A temporary grade, limited to situations with extenuating circumstances, giving a student additional time to complete course requirements <b>(See below)</b>	(50% - 59%)
R	Repeat - The student has not achieved the objectives of the course, and the course must be repeated	(0% - 59%)
CR	Credit exemption	

The method of calculating your weighted average will be defined by your instructor. Since grades are based upon averages, it follows that good marks in some tests can compensate for a failing mark in another test.

**VI. EVALUATION PROCESS/GRADING SYSTEM (Continued):****Make-Up Test (if applicable)**

An “X” grade may be assigned at the end of the regular semester if you have met **ALL** of the following criteria:

- an overall average between 50% and 59% was achieved
- at least 50% of the tests were passed
- at least 80% of the scheduled classes were attended
- at least 80% of quizzes and assignments were submitted
- all of the topic tests were written

If you are assigned an “X” grade, you may convert it to a “C” grade by writing a make-up test on topics agreed to by the instructor. This test will be available at the time agreed to by your instructor.

At the end of the regular term, it is your responsibility to obtain your results from your instructor and, in the event of an “X” grade, to inquire when the make-up test will be available.

The score you receive on this make-up test will replace your original test score and be used to re-calculate your weighted average. If the re-calculated average is 60% or greater, a “C” grade will be assigned. If the re-calculated average is 59% or less, an “R” grade will be assigned.

**“R” and “X” Grades at the end of the Semester**

If an “X” grade is not cleared by the specified date, it will become an “R” grade. Except for extenuating circumstances, an “X” grade in Math will not be carried into the next semester.

**“R” Grades during the Semester**

A student with a failing grade and poor attendance (less than 80% attendance) may be given an “R” at any time during the semester.

**VII. SPECIAL NOTES:**

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities), are encouraged to discuss required accommodations with the professor and/or contact the Special Needs Office.

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**VII. SPECIAL NOTES (continued):**

**Advanced Standing**

Students who have completed an equivalent post-secondary course must bring relevant documents to the Coordinator, Mathematics Department:

- a copy of course outline
- a copy of the transcript verifying successful completion of the equivalent course

Note: A copy of the transcript must be on file in the Registrar's Office.

**VIII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the instructor or the Prior Learning Assessment Office (E2203).