

Hong Kong Baptist University
Faculty of Science
Department of Mathematics

Title (Units): MATH 1680 Manage your Money without Formulas

Course Aims: This course is intended to introduce basic growth models to fancy and complicated annuity models. Formula is useful only for regular patterns, however, that is not what going on around us. Students will explore a sequence of financial problems with Hong Kong daily life examples in order to improve their sensitivity to numbers and helps them take control of their financial situations.

Prepared by: Leevan Ling

Learning Outcomes (LOs):

Upon successful completion of this course, students should be able to:

No.	Learning Outcomes (LOs)
	Knowledge
1	Explain the basic concepts of predicting trends of interest
2	Analyze the fundamental construction of loans
3	Manipulate and sketch elementary functions and transcendental functions
	Skills
4	Manipulate spreadsheet to model financial products
5	Develop and apply simple mathematical models for financial daily applications
	Attitudes
6	Solve problems independently and collaboratively as part of a team

Teaching & Learning Activities (TLAs)

CILO	TLAs will include the following:
1,2,3,5	Simple real life problems will be demonstrated in lectures to explain the concepts and strategies of money issues. Spreadsheet software will be used for iterative calculations in order to consolidate the knowledge.
3-6	In lectures, the instructor will discuss how to handle sophisticated financial plans offered by Hong Kong financial institutions, and to realize the common risk indicators in stock market mathematically. Students will also be required to attempt the assignments questions and they have to present their mathematical models and solutions and spreadsheet calculations in written form.

Assessment:

No.	Assessment Methods	Weighting	CILO Addressed	Remarks
1	Continuous Assessment	50%	1-6	A mid-term test and Continuous Assessment are designed to measure how well the students have learned the basic concepts and fundamental theories of the courses.
2	Final Examination	50%	1-5	Final Examination questions are designed to see how far students have achieved their intended learning outcomes. Questions will primarily be analysis and skills based to assess the student's versatility in solving problems in manipulating the mathematical models.

Learning Outcomes and Weighting:

Content	LO No.	Teaching (in hours)
1. Money Growth	1, 3-6	3
2. Loan with Real-Life Applications	2, 3-6	6
3. Loan in Our Complex Society	2, 3-6	12
4. Making Money	1, 3-6	9
5. Risk and Volatility	3-6	9

Textbook: Ling, L. (2010) *Manage Your Money without Formulas*, HKMS, Preprint

References:

1. COMAP. (2007). *For All Practical Purposes: Mathematical Literacy in Today's World* (7th Edition). W. H. Freeman.
2. Lovelock, D., Mendel, M. & Wright, A.L. (2007). *An Introduction to the Mathematics of Money: Saving and Investing*. Springer.
3. Winston, W.L. (2004). *Microsoft Excel Data Analysis and Business Modeling*. Microsoft Press.
4. Tannenbaum, P. (2009). *Excursions in Modern Mathematics* (7th Edition). Prentice Hall.
5. Miller, C.D., Heeren, V.E. & Hornsby J.S. (2007). *Mathematical Ideas* (11th Edition). Pearson Education (US).
6. Frasca, R.R. (2009). *Personal Finance and Integrated Planning Approach* (8th Edition.). Pearson Education (US).

Course Content in Outline:

<u>Topic</u>	<u>Hours</u>
I. Money Growth	3
a. Simple Interest	
b. Compound Interest	
c. Different Compounding Periods	
d. Forward and backward problem	
II. Loan with Real-Life Applications	6
a. Car Loan	
b. Student Loan	
c. Personal Installment Loan	
d. Interest Rate	
e. Mortgage	
III. Loan in Our Complex Society	12
a. Car Loan with Early Payback	
b. Personal Installment Loan---Complex Plan	
c. Mortgage—Mixed Plan	
IV. Making Money	9
a. Saving Plans	
b. Saving Plans with Insurance Growth and Decay	
c. Insurance	
d. Retirement Plans	
V. Risk and Volatility	9
a. Dollar Cost Averaging	
b. Stock Movement	
c. Monte Carlo Simulation	