

Faculty of Commerce and Accountancy
Chulalongkorn University
Course Syllabus

1. Course Number	2604495
2. Course Credit	3
3. Course Title	Introduction to Financial Engineering
4. Faculty/Department	Commerce and Accountancy/Banking and Finance
5. Semester	1
6. Academic Year	2018
7. Instructor	Assist. Prof. Dr. Thaisiri Watwai (E-mail:thaisiri@cbs.chula.ac.th)
8. Condition	-
9. Status	Elective
10. Curriculum	BBA in Banking and Finance
11. Degree	Bachelor
12. Hours/Week	3 hours/week

13. Course Description

Introduction to discrete-time and continuous-time stochastic processes; ordinary and exotic options; interest rate derivatives; derivative pricing; hedging; security design.

14. Course Outline

14.1 Objectives

	Course objectives	Learning Outcome*	Teaching Approach	Evaluation Approach
1	To understand the fundamental concepts of financial engineering and be able to apply the knowledge to and analyze fairly technical problems	1,3,4	1,2,6	1,2,3,4,5
2	To be able to self-learn more advanced materials in financial engineering	5	1,2,6	4,5
3	To be able to live happily while study very hard and willing to participate in class activities	7	2	5

14.2 Contents

Week	Date	Description	Recommended Readings	Course Objectives	Student Assignments
1	TBA	Interest Rates and Bonds	[T] 1.1	1,3	
2	TBA	Binomial Trees and Time Series Models	[T] 1.2-1.3	1,3	HW1
3	TBA	Continuous-time Models	[T] 1.4	1,3	
4	TBA	Forwards and Futures	[T] 2.1	1,3	HW2
5	TBA	Swaps	[T] 2.2	1,3	
6	TBA	Options	[T] 2.3	1,3	HW3
7	TBA	Arbitrage	[T] 3.1	1,3	
	TBA	MIDTERM EXAMINATION			
8	TBA	Replicating Portfolios	[T] 3.2		HW4
9	TBA	Fundamental Theorems of Asset Pricing	[T] 3.3	1,3	
10	TBA	Introduction to MATLAB	[M], [T] 4.1	1,3	HW5
11	TBA	Option Pricing by Binomial Trees	[T] 4.2	1,3	
12	TBA	Trinomial and Bidimensional Trees	[T] 4.2	1,3	HW6
13	TBA	Monte Carlo Simulation	[T] 4.3	1,3	
14	TBA	Option Pricing by Monte Carlo	[T] 4.3	1,3	
15	TBA	Variance Reduction Techniques	[T] 4.3	1,3	
	TBA	FINAL EXAMINATION		1,3	
	TBA	FINAL PROJECT PRESENTATION		1,2,3	

Teaching Aids

PowerPoint and White board

14.3 Course Evaluation

Homework 10% (Once every second weeks, and due in two weeks)

Midterm 30% (2-hour close-book exam covering lectures 1-7)

Final 30% (3-hour close-book exam covering lectures 1-15)

Final Project 30%

Homework

Homework assignments will be given every second weeks and are due the following two weeks in class. You are encouraged to discuss homework with your friends and me, but **you need to prepare your solution by yourself**. No late homework is accepted.

Final Project

Each group of students will need to implement a financial model using MATLAB, and present their work. Each group must submit a manual indicating how to use the program with some examples, and the codes with sufficient comments. The project is due on the presentation day.

15. List of Materials

15.1 Required

[T] Thaisiri Watwaj, A Concise Introduction to Financial Engineering, Theory and Applications, 2014

15.2 Optional

[M] MATLAB Primer, http://www.mathworks.com/help/pdf_doc/matlab/getstart.pdf

[PB] Paola Brandimarte, Numerical Methods in Finance and Economics, Wiley, Second Edition, 2006

15.3 Electronic / Web sites: <http://blackboard.car.chula.ac.th>.

16. Teaching Evaluation

16.1 Type of Evaluation: Online and paper-based course evaluation

16.2 Changes made in accordance to previous teaching evaluation

Change required textbook

16.3 Discussion or Analysis which develops Desired Characteristics of Chulalongkorn University Graduates

Knowledge: Lectures will focus on theoretical and practical concepts.

Skills: Homework and project will sharpen students' skills.

Ethics: Students who fail to comply with the code of conduct will be given the fail grade.

Social: Class participation is highly encouraged.

17. Code of Conduct

Here is a small part of the Code of Conduct for Penn State students.

“Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected

to act in accordance with this principle. Consistent with this expectation, students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts. Academic integrity includes a commitment not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others.

Academic dishonesty includes, but is not limited to, cheating, plagiarism, fabrication of information or citations, facilitation of acts of academic dishonesty by others, unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, and tampering with the academic work of other students”

*We adopt this statement in this course. Students who fail to comply with this statement will be given a **Fail grade as a minimum penalty**.* In this course, students who make theirs and/or the works of others available to someone who may engage in academic dishonesty due on the availability of such works will be given a **Fail grade as a minimum penalty** as those students facilitate the acts of academic dishonesty. All students are required to read and understand the content available in the following website before they submit the first homework:

http://en.wikipedia.org/wiki/Academic_dishonesty

18. Additional Rules

Code of conduct in a classroom

1. The use of any communication device is not allowed if the purpose is not related to the learning and teaching process.
2. Drinking and eating are not allowed (except water from a screw-capped bottle).
3. Students must be wearing the proper Chulalongkorn student uniform before they may enter the classroom.
4. Any activity that disturbs class or disturbs other students is not allowed.
5. Students must not come to class more than 15 minutes late.

Punishment if violation

1. A maximum of 5 scores will be deducted from the class scores or students will be asked to leave the classroom.
2. Lecturers will report the violation(s) to the Department of Banking and Finance if students violate the code for at least 3 times. Student names will be recorded on a blacklist. Department members will not write a letters of recommendation for blacklisted students (for a period of up to 3 years after graduation).

***Notes**

Desired Characteristics of Chulalongkorn University Graduates			
1	Knowledge	1.1	Well-round Knowledge
		1.2	In-depth Knowledge
2	Ethics	2.1	Moral and Ethics
		2.2	Professional Ethics
3	Ability to Think	3.1	Critical Thinking
		3.2	Creative Thinking
		3.3	Problem Solving
4	Skills	4.1	Professional Skills
		4.2	Communication Skills
		4.3	Information Technology Skills
		4.4	Mathematical and Statistical Skills
		4.5	Management Skills
5	Lifelong Learning	5.1	Inquisitiveness
		5.2	Knowing how to learn
6	Leadership		
7	Well-being		
8	Community-mindedness		
9	Maintaining Thainess in the Globalized World		

Teaching Approach	
1	Lecture
2	Discussion
3	Workshop/Lab
4	Seminar
5	Demonstration
6	Projects
7	Field
8	Tutorial Group
9	Brainstorm
10	Problem-based Learning
11	Case Study
12	Summary and Presentation
13	Practicum
14	Activities
15	Others.....

Evaluation Approach	
1	Examination (Written, Oral, Lab)
2	Activity and Participation
3	Assignment/Homework
4	Report
5	Observation
6	Others