FN 211 Course Outline

Course Title: Financial Mathematics and Statistics FN 211

Prerequisite: None

Semester: 2/2023

Prerequisite: None

Course Description:
This class provides background in mathematics and statistics that are crucial for study in corporate financial decision making and investments. The first half of the class introduces building blocks on the algebra of time value of money, linear algebra (matrices), derivatives and integrals with applications to optimization. The second half focuses on probability, statistics, and regression analysis. Emphasis is on computation and interpretation of risk and return statistics.

Course Objectives:
1. Acquaint students with the financial mathematics tools necessary for assessment of risk and return in financial decision making and investment management.
2. Learn techniques to organize and analyze data.
3. Develop scientific thinking and overcome anxiety about applying calculus and statistics in finance work.
4. Develop familiarity with use of excel statistics functions.

Class Time and Venue:
Date and time : Tuesday 13.00-16:00
Venue: Room 206

Instructors' Contact
Name: Bin Zhao, Ph.D.
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Teaching Assistants:

Miss Porchou Ear

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Main Texts:
(RB) Raymond Barnett, Michael Ziegler, and Karl Byleen, College mathematics for Business, Economics, Life Sciences, and Social Sciences, Pearson.

Recommended Texts & Materials:
รศ. ธีระศักดิ์ อุรัจนานนท์ ความน่าจะเป็นและสถิติประยุกต์ เล่ม 1 : สำนักพิมพ์ SE-ED

Wichai Witayakiattilerd 2020 คณิตศาสตร์การเงินและการประยุกต์ (**Financial Mathematics with applications) in Thai.**

(JS) James Stewart, Calculus, 8th ed., Thomson Brooks/Cole, 2016.

(PP) Pantisa Pavabutr, Mathematics for Financial Applications: Thammasat Business School, 2017. (Check TU Bookstore and on-line class posting)

(DF) DeFusco, McLeavery, Pinto, and Runkle, 2004. Quantitative investment analysis, CFA Investment Series, Wiley.

Class web:

https://classroom.google.com/c/NjUwNjg3NjUyNTA0?cjc=73vz6o3

Grading:

Midterm Examination	(27 Feb 2024: 15.00-17.00)	35%
Final Examination	(14 May 2024: 9.00-12.00)	35%
Quizzes & Participation		30%
Total		**100%**

Quiz date:
Quiz 1: Jan 30, 2024
Quiz 2: Feb 20, 2024
Quiz 3: Mar 26, 2024
Quiz 4: Apr 23, 2024

There will be no make up quiz. All types of calculators allowed. All quizzes are open book, but exams are closed book. All Quizzes/Exams are in English.

For the four quizzes, I will pick best three of four. For those who are frequently participating in class, your participation score can also replace a quiz if it is better.

Score	0-40	41-45	46-55	56--60	61-69	70-79	80-89	90-100
Grade	F	D	D+	C	C+	B	B+	A

Note: The table above outlines the grading scheme. The instructors have discretion to alter the range slightly depending on overall class performance. However, there will be no concessions for the D and F grade ranges.

Course Rules:
You are responsible for work on end-of-chapter problems and self-test problems yourselves. Solutions will be provided for your own self-test.

Expected Learning Outcomes:

	1. Morality and Ethics:	Expected Learning Outcomes:
N/A	1.1 Possess honesty, sacrifice, self-, social-, and environmental responsibility.	
N/A	1.2 Value "sufficiency" theory and adapt it in life path by adhering to adequacy, rationale, and immunity development.	
●	1.3 Value disciplines, respect, and comply with the rules and regulations of the institution and society at large.	Regular attendance, punctuality
N/A	1.4 Acquire knowledge related to business morality and ethics, and be able to handle ethical dilemma with integrity.	
	2. Knowledge:	**Expected Learning Outcomes:**
N/A	2.1 Acquire knowledge on and understand the important concepts in business management.	
●	2.2 Acquire and understand the important concepts related to data analysis processes in finance and measures of risk.	Pass quiz and exam
N/A	2.3 Acquire knowledge on and understand the important concepts related to business processes, planning, corporate structures, operations, control, performance evaluation and contingency plan to suit the circumstances.	
N/A	2.4 Acquire the knowledge on academic advancement and professional	

	development in business management including the understanding of the situational adaptability and its impacts on business.	
	3. Intellectual Development:	**Expected Learning Outcomes:**
●	3.1 Be able to search and process information and utilize various concepts appropriately in a given circumstance in order to obtain relevant information to benefit in the rapidly changing business environment.	Learn to search for resources for self-study.
N/A	3.2 Be able to think systematically, rationally and creatively and to integrate knowledge from other disciplines to solve the problems in business and other settings.	
N/A	3.3 Be able to collectively propose solutions to problems at hand and analyze the impacts of the proposed solutions and be able to choose the solution that is appropriate to a given situation to ensure business competitive advantages.	
	4. Interpersonal Skills and Responsibilities:	**Expected Learning Outcomes:**
●	4.1 Be able to work in team, possess interpersonal skills and leadership skills, and be professionally adaptive to a given situation.	Participate in group and class discussion.
N/A	4.2 Be creative and constructively criticize to solve problem of the team.	
N/A	4.3 Be responsible in lifelong learning to develop self and professional career.	
	5. Quantitative Analysis, Communication and Information Technology:	**Expected Learning Outcomes:**

●	5.1 Be able to apply mathematics, statistics, quantitative analysis in analyzing and making decisions in business and daily life.	Pass exams and use statistical software and excel add-ins mathematical and statistics functions.
N/A	5.2 Be able to efficiently communicate in Thai and foreign languages that are relevant in doing business.	
N/A	5.3 Be able to explain the issues and make the issues clear in verbal or writing, and be able to choose the appropriate pattern of communication for different groups of audience both in business context and in other contexts.	
N/A	5.4 Be able to utilize the information technologies or others to support the business operations.	

Tentative class schedule

Session/Date & Time	Topics	Activities/Text & Materials/ Media
#1: Jan 9	Exponential and logarithmic functions Applications: Growth and decay, time value of money	RB Ch 2,3
#2: Jan 16	Linear equations Constant vs linear vs quadratic Applications: Demand, supply functions	RB Ch 1 and 2
#3: Jan 23	Quadratic equations Applications: Revenue, cost, profit functions	RB Ch 4
#4: Jan 30	Linear systems and matrices	RB Ch 4
#5: Feb 6	Introduction to limits and continuity Basic derivatives and marginal analysis in financial economics	RB Ch 10 JS Ch. 2/ JS Ch.3
#6: Feb 13	Applications of differentiation: Optimization	RB Ch 11, 13 JS Ch.4

#7 Feb 20	Applications of differentiation: Intro to integrals	DF Ch 3
	Mid-term exam 27 Feb 2024: 15.00-17.00	
#8: Mar 5	Probability	DF Ch 4 PP Ch. 4
#9: Mar 12	Discrete distribution: Uniform, binomial	DF Ch 5 PP Ch. 5
#10: Mar 19	Continuous distribution: Uniform, normal, standard normal	DF Ch 5 PP Ch. 5
#11 Mar 26	Data summary: Univariate Descriptive statistics and hypothesis testing	DF Ch 6,7
#12: Apr 2	Hypothesis testing	DF Ch 8
#13: Apr 9	Bivariate statistics: Covariance and correlation	DF Ch 8
#14: Apr 23	Multivariate statistics: Single variable regression	DF Ch 9
#15: Apr 30	Multivariate statistics: Multi- variable regression	
	Final exam 14 May 2024: 9.00-12.00	