

Course Outline

FN211 Financial Mathematics and Statistics

Semester 1/2022 (August 8th – November 26th, 2022)

Number of Credit: 3 credits (3-0-6)

Prerequisite: -

General Information:

This class develops 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 in calculus whereas the second half tackles the mathematical concepts of time value of money, probability, statistics, and matrix algebra.

Course Description:

Essentials of statistics and mathematics for financial applications: basic statistics, the concept of risk and return, probability, regression analyses, basic calculus (e.g. introduction to derivatives, integration, and integral), optimization, and basic matrices.

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 Logistic

Class day: Thursday

Class time: 2.00 – 5.00 PM

Venue: Room 202, 2nd floor, Faculty of Economics

Teaching Materials Platform: BE Moodle <http://bemoodle.econ.tu.ac.th/>

Instructor:

Name: Dr. Winai Homsombat
Office Hours: By appointment
Email: winai.hom@kmutt.ac.th

Main Text:

- Wackerly, D.D., Mendenhall III, W., and Scheaffer, R.L. (2002). Mathematical Statistics with Applications. 6th ed. Thomson Learning.
- Stewart, J. (2016). Calculus. 8th ed. Thomson Brooks/Cole.

Recommended Texts & Materials

- Anderson, D.R., Sweeney, D.J., Williams, T.A., Camm, J.D., and Cochran, J.J. (2017). Statistics for Business and Economics. Thirteenth Edition. Cengage Learning.
- Ruppert, D. (2011). Statistics and data analysis for financial engineering (Vol. 13). New York: Springer.
- Miller, M. B. (2013). Mathematics and statistics for financial risk management. John Wiley & Sons.

Grading Criteria:

The course grades will be based on two exams (individual performance) and homework or quizzes (individual performance). Grading scheme is as follows.

Class participation	10%
Quiz and Assignment	20%
Mid-term examination	30%
Final examination	40%

Type of evaluation	Evaluation Method	Evaluation date
Class participation and Assignment	Written assignment or quiz (Essay questions)	During Week 1-15
Mid-term	Examination	Thursday, September 29, 2022 3.00 – 5.00 PM
Final	Examination	Wednesday, December 14, 2022 09.00 AM – noon

Class policies:

1. Lectures will stress the most important issues addressed in the readings. You are responsible for all material covered in class and assigned readings. Lectures may go beyond the scope of the textbook. Therefore, it is important for you to attend and participate in class.
2. There will be assignments as deemed appropriate to accommodate effective learning. Each assignment will be graded based on the quality of the analysis and the ability to apply the principles of financial management for managerial decision. Lecture notes, exercises, and guided solution to each lecture, as well as other useful materials, could be accessible from class Moodle.
3. You are responsible for all announcements and changes made in class. However, there will be no make- up quiz and final examination without prior consent from the instructor. If a student has a legitimate, verifiable reason (e.g., doctor' s note), a separate comprehensive examination will be given.

Tentative Class Schedule:

Week	Content
1	Review of basic statistics and calculus
2	Discrete Random Variables and Their Probability Distributions - Basic Definition and the probability Distribution for a Discrete Random Variable - The Expected Value of a Random Variable or a Function of a Random Variable - The Binomial Probability Distribution
4 – 5	Continuous Random Variables and Their Probability Distributions - Introduction and The Probability Distribution for a Continuous Random Variable - Expected Values for Continuous Random Variables - The Uniform Probability Distribution - The Normal Probability Distribution - Other Expected Values
6 – 7	Multivariate Probability Distributions - Introduction - Bivariate and Multivariate Probability Distributions - Marginal and Conditional Probability Distributions - Independent Random Variables - The Expected Value - The Variance and Covariance of Two Random Variables - The Multinomial Probability Distribution - Conditional Expectations
Mid term Exam: Thursday, September 29, 2022 (3.00 – 5.00 PM)	
8 – 9	Risk and Return - Asset Return and Risk - Introduction to VaR
10 – 11	Basic Matrices - Matrix Notation - Matrix Operations - Vector Spaces - Applications
12 – 13	Regression Analyses - Simple Regression - Multiple Regression - Applications
14 – 15	Optimization - Constrained Optimization - Unconstrained Optimization - Applications
Final Exam: Wednesday, December 14, 2022: (09.00 AM – noon)	

Important Date:

Semester 1/2022 (August 8 – November 26, 2022)	
Classes Begin	August 8, 2022
Add-drop period	August 8 – 21, 2022 <i>(from 9.00 AM of August 8 to 10.30 PM of August 21)</i>
<i>H.M. Queen Sirikit The Queen Mother's Birthday*</i>	<i>August 12, 2022</i>
Tuition Fee Payment Period (Via TU Greats App)	August 22 – 24, 2022 <i>(9 AM - 10.30 PM)</i>
Mid-term Examination Period	September 25 – October 2, 2022
Withdrawal period with "W" on record	August 26 – October 16, 2022 <i>(from 9.00 AM of August 26 to 10.30 PM of October 16)</i>
<i>H.M. King Bhumibol Adulyadej The Great Memorial Day*</i>	<i>October 13, 2022</i>
<i>King Chulalongkorn's Day*</i>	<i>October 23, 2022</i>
<i>Substitution for King Chulalongkorn's Day*</i>	<i>October 24, 2022</i>
Last day of class for Semester 2/2021	November 26, 2022
Final exam period	November 28 – 30, December 1 – 4, 6 – 9, 13 – 16, 2022
<i>H.M. King Bhumibol Adulyadej The Great's Birthday*</i>	<i>December 5, 2022</i>
<i>Constitution Day*</i>	<i>December 10, 2022</i>
<i>Substitution for Constitution Day*</i>	<i>December 12, 2022</i>
Submitting Forms for Degree Conferral	August 8 – 21, 2022

Remark * Holiday, No classes during this period