



ÇANKAYA UNIVERSITY

Faculty of Arts and Sciences

Course Definition Form

Part I. Basic Course Information

Department Name	MATHEMATICS	Dept. Numeric Code	2 7	
Course Code	M A T H 3 3 2	Number of Weekly Lecture Hours	4	
		Number of Weekly Lab/Tutorial Hours	0	
		Number of Credit Hours	4	
Course Web Site	http:// math332.cankaya.edu.tr		ECTS Credit	0 6

Course Name <i>This information will appear in the printed catalogs and on the web online catalog.</i>	
English Name	Introduction to Financial Mathematics
Turkish Name	Finansal Matematiğe Giriş

Course Description <i>Provide a brief overview of what is covered during the semester. This information will appear in the printed catalogs and on the web online catalog. Maximum 60 words.</i>	
Historic remarks. Introduction to cashflow analysis, the time value of money, simple and compound interest. Efficient market hypothesis, stocks and bonds, derivative instruments. Elements of Probability Theory. Introduction to stochastic processes. Option pricing, European options, Black-Scholes formula. Non Gaussian models.	

Prerequisites (if any) <i>Give course codes and check all that are applicable.</i>	1 st	2 nd	3 rd	4 th
	<input type="checkbox"/> Consent of the Instructor	<input type="checkbox"/> Senior Standing	<input type="checkbox"/> Give others, if any.	
Co-requisites (if any)	1 st	2 nd	3 rd	4 th
Course Type <i>Check all that are applicable</i>	<input checked="" type="checkbox"/> Must course for dept. <input type="checkbox"/> Must course for other dept.(s) <input type="checkbox"/> Elective course for dept. <input type="checkbox"/> Elective course for other dept.(s)			

Course Classification <i>Give the appropriate percentage for each category.</i>				
Category	Mathematics & Natural Sciences			
Percentage	100			

Part II. Detailed Course Information**Course Objectives***Maximum 100 words.*

The aim of the course is to give the necessary background of Financial Mathematics and option pricing.

Learning Outcomes*Explain the learning outcomes of the course. Maximum 10 items.*

The students will learn:

1. Cashflow analysis
2. Market hypothesis
3. Elements of Probability Theory
4. Introduction to Stochastic Processes with application in the Theory of Pricing
5. Introduction to the Theory of Option Pricing, Black-Scholes formula and Non-Gaussian models

Textbook(s)*List the textbook(s), if any, and other related main course material.*

Author(s)	Title	Publisher	Publication Year	ISBN
Paul Wilmott	Mathematics of Financial Derivatives. A Student Introduction	Cambridge University Press	1995	Paul Wilmott
J Robert Buchanan	An Undergraduate Introduction to Financial Mathematics Second Edition	World Scientific Publishing	2008	J Robert Buchanan

Reference Books*List, if any, other reference books to be used as supplementary material.*

Author(s)	Title	Publisher	Publication Year	ISBN

Teaching Policy*Explain how you will organize the course (lectures, laboratories, tutorials, studio work, seminars, etc.)*

2 hours of lecturing per week. 2 hours applications. Attendance to the lectures is compulsory.

Laboratory/Studio Work*Give the number of laboratory/studio hours required per week, if any, to do supervised laboratory/studio work and list the names of the laboratories/studios in which these sessions will be conducted.*

--

Computer Usage

Briefly describe the computer usage and the hardware/software requirements for the course.

--

Course Outline

List the weekly topics to be covered.

Week	Topic(s)
1	General background of Financial Mathematics. Introduction to cashflow analysis.
2	The time value of money. Simple and compound interest.
3	Efficient market hypothesis. Stocks and bonds. Derivative instruments.
4	Elements of Probability Theory.
5	Probabilistic models
6	Introduction to Stochastic Processes. Filtration, conditional expectations, martingales.
7	Wiener and Levy processes, Khintchine-Levy formula.
8	Stochastic models. Geometric Brownian motion.
9	Option pricing. European options.
10	Profit and loss diagrams. Put-call parity.
11	Black-Scholes formula.
12	Applications of Black-Scholes formula.
13	Non-Gaussian models in the Theory of Pricing
14	Conclusions

Grading Policy

List the assessment tools and their percentages that may give an idea about their relative importance to the end-of-semester grade.

Assessment Tool	Quantity	Percentage	Assessment Tool	Quantity	Percentage	Assessment Tool	Quantity	Percentage
Homework			Case Study			Attendance		
Quiz(es)			Lab Work			Field Study		
Midterm Exam	2	60	Classroom Participation			Project		
Term Paper			Oral Presentation			Final Exam	1	40

ECTS Workload <i>List all the activities considered under the ECTS.</i>			
Activity	Quantity	Duration (hours)	Total Workload (hours)
Attending Lectures (<i>weekly basis</i>)	14	4	56
Attending Labs/Recitations (<i>weekly basis</i>)	-	-	-
Compilation and finalization of course/lecture notes (<i>weekly basis</i>)	14	1	14
Collection and selection of relevant material (<i>once</i>)	1	8	8
Self study of relevant material (<i>weekly basis</i>)	14	2	28
Take-home assignments	-	-	-
Preparation for quizzes	-	-	-
Preparation for mid-term exams (<i>including the duration of the exams</i>)	2	14	28
Preparation of term paper/case-study report (<i>including oral presentation</i>)	-	-	-
Preparation of term project/field study report (<i>including oral presentation</i>)	-	-	-
Preparation for final exam (<i>including the duration of the exam</i>)	1	16	16
TOTAL WORKLOAD / 25			150/25
ECTS Credit			6

Total Workloads are calculated automatically by formulas. To update all the formulas in the document first press CTRL+A and then press F9.

Program Qualifications vs. Learning Outcomes <i>Consider the program qualifications given below as determined in terms of learning outcomes and acquisition of capabilities for all the courses in the curriculum. Look at the learning outcomes of this course given above. Relate these two using the Likert Scale by marking with X in one of the five choices at the right.</i>						
No	Program Qualifications	Contribution				
		0	1	2	3	4
1	Adequate knowledge in mathematics; ability to use applied and theoretical information in these areas to solve pure and applied mathematics problems.					X
2	Ability to use modern computational tools to analyze an abstract or real life problem			X		
3	Adequate knowledge in theoretical and historical background in mathematics					X
4	Ability to work individually and in teams efficiently, ability to collaborate effectively in teams to analyze complex systems from intra-disciplinary and multi-disciplinary areas				X	
5	Ability to communicate effectively in English about technical subjects, both orally and in writing				X	
6	Ability to use, develop and implement new experiments and algorithms to solve scientific, engineering and financial problems				X	
7	Ability to analyze a mathematical problem using both analytical and numerical methods; use and compare theoretical and simulational methods to gain deeper insight			X		
8	Ability to report the findings, conclusions and interpretations related to a project in the area of pure and applied mathematics, ability to write technical reports, to prepare and conduct effective presentations				X	
9	Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to keep continuous self improvement				X	
10	Awareness of professional and ethical responsibility issues and their legal consequences					X

Scale for contribution to a qualification: 0-none, 1-little, 2-moderate, 3-considerable, 4-highest