

ÇANKAYA UNIVERSITY Faculty of Arts and Sciences

Course Definition Form

This form should be used for either an elective or a compulsory course being proposed and for a curriculum development process for an undergraduate curriculum at Çankaya University, Faculty of Arts and Sciences. Please fill in the form completely and submit the print-out carrying the approval of the Department Chair to the Dean's Office and mail its electronic copy to <u>serpilkilic@cankaya.edu.tr</u>. Upon receipt of *both copies*, the print-out will be forwarded to the Faculty Academic Board for approval. Incomplete forms will be returned to the Department. The approved form is finally sent to the President's office for approval by the Senate.

Part I. Basic Course Information

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

	Course Name This information will appear in the printed catalogs and on the web online catalog.					
English Name	Introduction to Applied Probability and Statistics					
Turkish Name	Uygulamalı Olasılık ve İstatistiğe Giriş					

Course Description

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.

Basics of Statistics, Axioms of Probability, Events, Conditional Probability, Independence, Bayes' Rule, Random Variables, Joint Random Variables, Mathematical Expectation, Discrete Random Variables: Binomial, Hypergeometric, Negative Binomial, Geometric and Poison Distribution, Continuous Random Variables: Normal, Gamma and Exponential Distribution, Sampling Distributions, Central Limit Theorem, Regression, Correlation, Model Building.

Prerequisites (if any) Give course codes and check all that are applicable.		1 st	2 nd	3 rd		4 th	
		Consent of the Instructor	Senior Standing	Give others, if any.			
Co-requisites (if any)			2 nd	3 rd		4 th	
	Course Type Check all that are applicable			Elective course for dept.	⊠ E	Elective course for o	other dept.(s)
Course Clas		1 entage for each category.					
Category Mathematics & I		natics & Natural Sciences	Engineering & Architectural Sciences	Technology		ninistrative & cial Sciences	

5

10

80

Percentage

5

Part II. Detailed Course Information

Course Objectives Maximum 100 words.

This course is intended to give the students the fundamental knowledge on Probability and Statistics with hand-on application.

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

By the end of the year students will be able to

- 1) set up probability models for a range of random phenomena, both discrete and continuous.
- 2) apply the notions of conditional probability,
- 3) recognise where the use of certain standard probability distributions would be appropriate.
- 4) understand correlation and build models with appropriate variables.

Textbook(s) List the textbook(s), if any, and other related main course material.							
Author(s)	Title	Publisher	Publication Year	ISBN			
R. Walpole, R. Myers, S. Myers, Keying Ye	Probability & Statistics for Engineers & Scientists, 9th Edition	Pearson	2016	978-0134468914			

Reference Books List, if any, other reference books to be used as supplementary material.							
Author(s) Title Publisher Publication Year ISBN							
G. Jay Kerns	Introduction to Probability and Statistics Using R, 3rd edition	GNU Public License	2018	978-172634390			

Teaching Policy

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

3 hours of lecturing per week and 2 hours lab work. All lectures will be given by the instructor. There will be three exams: Two midterms and a final, comprising 40% and 40% of the course grade, respectively and 10 quizzes comprising 20% of the course grade. To use mathematics effectively, one need not just knowledge but skills as well. The only way to develop your math skills is by solving many problems. Therefore this aspect of the course is emphasized. The students will need a scientific calculator.

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.

There will be 2 hours of lab sessions each week, given by the instructor. The applications of theoretical concepts will be through the labs. Also, quizzes will be during the lab hours.

Computer Usage

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

The ideas of probability that students learn in this course will be applied to several programming languages. This is why it is necessary to have lab settings with one computer for each student. There exists some softwares already in lab computers, so the proper one can be chosen to use.

	e Outline weekly topics to be covered.
Week	Topic(s)
1	Basics of Statistics
2	Axioms of Probability
3	Conditional Probability and Independence
4	Random Variables and Probability Distributions, Mathematical Expectation
5	Binomial and Multinomial Distributions
6	Hypergeometric Distribution, Negative Binomial Distribution
7	Geometric Distribution
8	Poisson Distribution
9	Normal Distribution
10	Normal Approximation to the Binomial
11	Gamma and Exponential Distributions
12	Sampling Distributions : Sample Distribution of Means and The Central Limit Theorem
13	Regression and Correlation
14	Model Building

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	1	20	Field Study			
Midterm Exam	1	30	Classroom Participation			Project			
Term Paper			Oral Presentation			Final Exam	1	50	

List all the activities considered under the ECTS. Activity	Quantity	Duration (hours)	Total Workload (hours)
Attending Lectures (weekly basis)	14	3	42
Attending Labs/Recitations (weekly basis)	14	2	28
Compilation and finalization of course/lecture notes (weekly basis)	14	1	14
Collection and selection of relevant material (once)	1	10	10
Self study of relevant material (weekly basis)	14	3	42
Take-home assignments			
Preparation for lab work	1	5	5
Preparation for mid-term exams (including the duration of the exams)	1	5	5
Preparation of term paper/case-study report (including oral presentation)			
Preparation of term project/field study report (including oral presentation)			
Preparation for final exam (including the duration of the exam)	1	14	14
	TOTAL	WORKLOAD / 25	160/25
		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.

No	Program Qualifications			Contribution					
NO		0		1 2		4			
1	Adequate knowledge in mathematics; ability to use applied and theoretical information in these areas to solve pure and applied mathematical problems.					x			
2	Ability to use modern computational tools to analyze an abstract or real life problem					х			
3	Adequate knowledge in theoretical and historical background in mathematics				х				
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				х				
5	Ability to communicate effectively in English about technical subjects, both orally and in writing				х				
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					х			
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				х				
10	Awareness of professional and ethical responsibility issues and their legal consequences								

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

Part III New Course Proposal Information State only if it is a new course

Is the new course replacing a former course in the curriculum?				No ⊠	Forme	r Course's Code	Former Course's Nam	8
Is there any similar course which has content overlap with other courses offered by the university?			Yes ⊠	No	Most Sim	H 3 2 7	Most Similar Course's Na Introduction to Probab and Statistics	
Frequency of Offerings Check all semesters in which the course is to be offered.				all	Spring	Summer		
First Offering Academic Year 2 0 2 4 / 2				5		Semester	Fall Spring	
Maximum Class Siz	e Proposed 60	Student Quota for Othe	er Depai	rtments	10	Approximate Nur Expected to Take	nber of Students e the Course	40
Justification for the Maximum 80 words	e proposal							
Concepts of statistics and probability theory are fundamental to an understanding of computer science structures and modeling of real life problems.								

Part IV Approval

	Faculty Member Give the Academic Title first.	Signature	Date
Proposed by	Dr.Öğr. Üyesi Ceylan YALÇIN		

Departmental Board sitting date		Sitting number	Motion number	
Department Chair	Dr.Öğr. Üyesi Erkan Murat TÜRKKAN	Signature	Date	

Faculty Academic Board sitting date		Sitting number	Motion number	
Dean	Prof. Dr. Fahd JARAD	Signature	Date	

Senate	Sitting	Motion	
sitting date	number	number	