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 2 7	**Number of Weekly Lecture Hours**	4	**Number of Weekly Lab/Tutorial Hours**	0	**Number of Credit Hours**	4
Course Web Site	http:// math327.cankaya.edu.tr					**ECTS Credit**	0 6

Course Name *This information will appear in the printed catalogs and on the web online catalog.*	
English Name	Introduction to Probability and Statistics
Turkish Name	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.

Statistical Inference, Sampling Procedures, Statistical Modeling, Graphical Methods, Data Description, Sample Spaces, Events, Algebra of Events, Probability of Events, Conditional Probability, Bayes' Rule, Random Variables, Joint Random Variables, Mathematical Expectation, Variance, Covariance, Discrete Random Variables: Binomial, Hypergeometric, Negative Binomial, Geometric and Poison Distribution, Continuous Random Variables: Normal, Gamma and Exponential Distribution, Random Sampling, Sampling Distributions, Central Limit Theorem, t-Distribution, F-Distribution

Prerequisites (if any) *Give course codes and check all that are applicable.*	1st	2nd	3rd	4th
	☐ Consent of the Instructor	☐ Senior Standing	☐ Give others, if any.	
Co-requisites (if any)	1st	2nd	3rd	4th
Course Type *Check all that are applicable*	☒ Must course for dept.	☒ Must course for other dept.(s)	☐ Elective course for dept.	☐ Elective course for other dept.(s)

Course Classification
Give the appropriate percentage for each category.

Category	Mathematics & Natural Sciences	Engineering & Architectural Sciences	Technology	Administrative & Social Sciences	
Percentage	80	10	5	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.

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 the principles of estimation for example maximum likelihood estimation, method of moments, confidence intervals.

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

Author(s)	Title	Publisher	Publication Year	ISBN
R. E. Walpole, R. H. Myers, S. L. Myers, K. Ye	Probability and Statistics for Engineers and Scientists	Prentice Hall	2002	0-13-098469-8

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

Author(s)	Title	Publisher	Publication Year	ISBN
W. A. Rosenkrantz	Introduction to Probablility and Statistics for Scientists and Engineers	McGraw-Hill	1997	0-07-053988-x
S. Ross	A First Course in Probablility	Prentice-Hall	2002	0-13-033851

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

4 hours of lecturing per week. All lectures will be given by the instructor. There will be three exams: Two midterms and a final, comprising 50% and 40% of the course grade, respectively and 10 quizzes comprising 10% 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, exercise sets will be provided for each section.
There will be extra problem solving sessions time to time, if it is needed, based on problems that students had difficulty solving at home..

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	Statistical Inference, Collection of Data, Measures of Location and Variability, Data Description.
2	Sample Space, Events, Algebra of Events, Axioms of Probability.
3	Conditional Probability, Multiplicative Rule, Independent Events, Bayes' Rule.
4	Random Variables, Discrete and Continuous Distributions.
5	Joint Probability Distribution.
6	Mean of a Random Variable, Variance and Covariance.
7	Linear Combinations of Random Variables.
8	Discrete Uniform Distribution, Binomial and Multinomial Distributions.
9	Hypergeometric, Geometric, Negative Binomial and Poison Distributions.
10	Continuous Uniform and Normal Distributions.
11	Gamma and Exponential Distributions and Applications.
12	Other Continuous Distributions.
13	Random Sampling.
14	Sampling Distributions, Central Limit Theorem.

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)	10	10	Lab Work			Field Study		
Midterm Exam	2	50	Classroom Participation			Project		
Term Paper			Oral Presentation			Final Exam	1	40

ECTS Workload
List all the activities considered under the ECTS.

Activity	Quantity	Duration (hours)	Total Workload (hours)
Attending Lectures (*weekly basis*)	14	4	56
Attending Labs/Recitations (*weekly basis*)			
Compilation and finalization of course/lecture notes (*weekly basis*)	14	1	14
Collection and selection of relevant material (*once*)	1	6	6
Self study of relevant material (*weekly basis*)	14	1	14
Take-home assignments			
Preparation for quizzes	10	1	10
Preparation for mid-term exams (*including the duration of the exams*)	2	15	30
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	20	20
		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 *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.*

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 mathematical 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