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 1 4 1	Number of Weekly Lecture Hours	3	Number of Weekly Lab/Tutorial Hours	0	Number of Credit Hours		3
Course Web Site	http:// math141.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	Analytic Geometry
Turkish Name	Analitik Geometri

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.

Cartesian Coordinates in the Plane, Review of Trigonometry, Polar Coordinates, Change of Coordinates, Vectors in the Plane, Cartesian Coordinates in 3-Space, Surfaces, Cylindrical and Spherical Coordinates, Conic Sections, Vectors in 3-Space

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			
Percentage	90	10			

Part II. Detailed Course Information

Course Objectives
Maximum 100 words.

The purposes of the course are:
- to teach basic concepts of analytic geometry in the plane and in the space,
- to teach basic properties and usage of vectors in the plane and 3-space,
- to teach general characteristics of planes, lines, conic sections and quadratic surfaces,
- to teach how to identify the shape of a given equation in 2 or 3 variables.

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

The students will be able to:
1. write equation of a given line or plane
2. write equations of conic sections and quadratic surfaces in standard forms
3. identify the shape of a given equation in 2 or 3 variables.
4. draw pictures of conic sections and quadratic surfaces

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

Author(s)	Title	Publisher	Publication Year	ISBN
Richard A. Silverman	Modern Calculus and Analytic Geometry	Dover Publications	2012	ISBN-13: 978-0486421001
H.İ. Karakaş	Analytic Geometry	METU	2011	---

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

Author(s)	Title	Publisher	Publication Year	ISBN
George B. Thomas Ross L. Finney	Calculus and Analytic Geometry	Adison Wesley	1995	ISBN-13: 978-0201531749

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

3 hours of lecturing per week. 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	Elements of Analytic Geometry, Cartesian Coordinates in the Plane: Lines in the Plane, Review of Trigonometry
2	Polar Coordinates, Change of Coordinates: Rotation and Translation
3	Vectors in the Plane: Directed Line Segments and Vectors, Algebra of Vectors
4	Scalar Product, Angle Between Two Vectors, Lines, Half Lines and Line Segments
5	Distance, Bisectors, Symmetry, Convex Sets, Half Planes, Polygons
6	Conic Sections: Fundamental Definitons, The Parabola, Central Conics
7	The Ellipse, The Hyperbola, Asymptotes of an Hyperbola
8	The General Quadratic Equation, Tangents and Polars
9	Algebra of Vectors in 3-Space, Scalar Product and Cross Product of Vectors in 3-Space
10	Planes and Lines in 3-Space, Distance from a Point to a Plane or to a Line
11	Families of Planes and Lines, Vectors in n-Space, Vectors with Complex Components
12	Surfaces: Spheres and Cylinders, Surfaces of Revolutions
13	Canonical Equations of Quadratic Surfaces, Change of Coordinates in 3-Space, Cylindrical Coordinates
14	Spherical Coordinates, The General Quadratic Equations

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)	5	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	3	42
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	7	7
Self study of relevant material (*weekly basis*)	14	3	42
Take-home assignments	-	-	-
Preparation for quizzes	5	2	10
Preparation for mid-term exams (*including the duration of the exams*)	2	10	20
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	15	15
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 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