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 4 1 8	**Number of Weekly Lecture Hours**	3	**Number of Weekly Lab/Tutorial Hours**	0	**Number of Credit Hours**	3
Course Web Site	http:// math418.cankaya.edu.tr					**ECTS Credit**	0 5

Course Name
This information will appear in the printed catalogs and on the web online catalog.

English Name	Calculus on Time Scales
Turkish Name	Zaman Skalalarında Analiz

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.

Basic Definitions, Differentiation, Integration, First Order Linear Equations, Second Order Linear Equations, Laplace Transform, Self-Adjoint Equations, Boundary Value Problems and Green's Function, Eigenvalue Problems.

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	80	20			

Part II. Detailed Course Information

Course Objectives
Maximum 100 words.

The aim of the course is to introduce students to a fairly new area of mathematics, i.e. calculus on time scales, which has several important applications, e.g., in the study of insect population models, heat transfer, neural networks, epidemic models and economic models.

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

1. The students will learn the basic calculus on time scales.
2. The students will learn how to implement the continuous and discrete analysis simultaneously.

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

Author(s)	Title	Publisher	Publication Year	ISBN
M. Bohner , A. Peterson	Dynamic Equations on Time Scales: An Introduction with Applications	Birkhauser	2001	0817642250

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

Author(s)	Title	Publisher	Publication Year	ISBN
M. Bohner , A. Peterson	Advances in Dynamic Equations on Time Scales	Birkhauser	2003	0817642935
V. Lakshmikantham, S. Sivasundaram, B. Kaymakcalan	Dynamic Systems on Measure Chains	Kluwer	1996	0792341163

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

The course consists of three 50-minute lectures per week.

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	Introduction and Basic Definitions
2	Differentiation
3	Integration
4	Chain Rules
5	First Order Linear Equations; Hilger's Complex Plane
6	The Exponential Function
7	Initial Value Problems
8	Second Order Linear Equations
9	Equations with Constant Coefficients
10	Equations with Variable Coefficients
11	Laplace Transform
12	Self-Adjoint Equations
13	Boundary Value Problems and Green's Function
14	Eigenvalue Problems

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	2	20	Case Study			Attendance		
Quiz(es)			Lab Work			Field Study		
Midterm Exam	2	50	Classroom Participation			Project		
Term Paper			Oral Presentation			Final Exam	1	30

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	5	5
Self study of relevant material (*weekly basis*)	14	1	14
Take-home assignments	2	5	10
Preparation for quizzes			
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	20	20
TOTAL WORKLOAD **/** 25			125/25
ECTS Credit			**5**

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				
		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

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.*

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