COURSE INFORMATION FORM

Course Name	Course Code
Difference Equations II	

Semester	Number of Course Hours per Week		Credit	ECTS
	Theory	Practice		
8	2	2	-	6

Course Category (Credit)				
Basic Sciences	Engineering Sciences	Design	General Education	Social
x				

Course Language	Course Level	Course Type
Turkish	Undergraduate	Elective

Prerequisite(s) if any	
Objectives of the Course	The main of the course is to introduce the concepts and techniques involved in the basic topics listed in this lecture and to develop skills in applying those concepts and techniques to the solution of problems.
Short Course Content	Derivation of Difference Equations, First-Order Difference Equations, Linear Difference Equations, Linear Difference Equations with Constant Coefficients, Homogenous and Nonhomogeneous Difference Equations Coefficients, Homogenous and Nonhomogeneous Difference Equations with Constant Coefficients, Nonlinear Difference Equations, Applications, Separable Variable Method, Difference-differential equations.

	Learning Outcomes of the Course	Contributed PO(s)	Teaching Methods *	Measuring Methods **
1	Student understands relation between difference equations and other science branches.	3,7	1,2,5	A
2	Student understands applications of difference equations in other science branches.	3,7	1,2,5	A
3	Student realizes responses of difference equations in real life.	8,12,15	1,2,5	A
4	Analytical thinking skills and the ability to make individual and independent decisions of student develops.	8,9	1,2,5	A
5	Ability to analyze and solve problems encountered of student develops.	4,9,13	1,2,5	A
6	Student learns computer applications of difference equations.	5,8,13	1,2,5	A
7	Ability to construct algorithm of student develops with difference equations.	5,8,13	1,2,5	A
8	Student learns transition between continuum and difference equations.	1,2,3	1,2,5	A

*Teaching Methods 1:Expression, **2:**Discussion, **3:**Experiment, **4:**Simulation, **5:**Question-Answer, **6:**Tutorial, **7:**Observation, **8:**Case Study, **9:**Technical Visit, **10:**Trouble/Problem Solving, **11:**Induvidual Work, **12:**Team/Group Work, **13:**Brain Storm, **14:**Project Design / Management, **15:**Report Preparation and/or Presentation

Measuring Methods A:Exam, **B:Quiz, **C:**Oral Exam, **D:**Homework, **E:**Report, **F:**Article Examination, **G:**Presentation, **I:**Experimental Skill, **J:**Project Observation, **K:**Class Attendance; **L:**Jury Exam

Main Textbook	Hüseyin BEREKETOĞLU, Vildan KUTAY, (2012) Fark Denklemleri, Gazi Kitabevi, Ankara.
Supporting References	Saber N. ELAYDI, (1995) An Introduction to Difference Equations, Springer (2001) Difference Equations: an introduction with applications, Academic Press.
Necessary Course Material	-

Course Schedule	
1	Fundamantel Definitions
2	Difference computation
3	Derivation of Difference Equations
4	First-Order Linear Difference Equations
5	High-Order Linear Difference Equations
6	Homogenous Difference Equations with Constant Coefficients
7	Problem Solving
8	Mid-Term Exam
9	Nonhomogeneous Difference Equations with Constant Coefficients
10	Separable Variable Method
11	Non-Linear Difference Equations which is convertible to Linear Difference Equations
12	Stability For Linear Difference Equations
13	Linear Difference Equations Systems
14	Difference-differential equations
15	Problem Solving
16,17	Final Exam

Calculation of Course Workload			
Activities	**Number**	**Time (Hour)**	**Total Workload (Hour)**
Course Time (number of course hours per week)	14	4	56
Classroom Studying Time (review, reinforcing, prestudy,….)	14	4	56
Homework			
Quiz Exam			
Studying for Quiz Exam			
Oral exam			
Studying for Oral Exam			
Report (Preparation and presentation time included)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	20	20
Final Exam	1	2	2
Studying for Final Exam	1	30	30
	Total workload		
	Total workload / 30		6
	Course ECTS Credit		

Evaluation	
Activity Type	**%**
Mid-term	40
Quiz	
Homework	
Bir öğe seçin.	
Bir öğe seçin.	
Final Exam	60
Total	100

RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO) (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	**PROGRAM OUTCOME**	**Contribution**
1	The ability to apply knowledges of Mathematics and Computer Sciences,	5
2	To have sufficient theoretical and practical knowledge of Mathematics at international level,	4
3	The ability of describing, modelling and solving of mathematical problems at Mathematics and related subjects,	5
4	The skill to solve and design a problem process in accordance with a defined target,	4
5	Skills to analyze data, interpret and apply to other datum and using these data on computer,	4
6	The skill to use the modern techniques and computational tools needed for mathematical applications,	3
7	The skill to make team work within the discipline and interdisciplinary,	3
8	The ability to improve oneself by following the developments on other modern, scientific and technological subjects as well as Mathematics and Computer Sciences,	4
9	The skill to communicate orally and in written way, in a clear and concise manner by having individual work skills and ability to independently decide and analytical thinking,	5
10	The skill to have professional and ethical responsibility,	2
11	The skill to have consciousness for quality issues and scientific research,	5
12	The skill to be sensitive to environmental issues related with problems and development of living area and consistent in the social relations,	1
13	Ability to solve problems in the working life faced to find an appropriate algoritms via mathematical modeling and to write computer programs,	4
14	The skill to developed design of software systems at different complex levels,	1
15	The credence of necessity of life-long learning and ability to apply the formation long-life learning.	2

LECTUTER(S)				
Prepared by	Doç. Dr. Ömer Ünsal			
Signature(s)				

Date:06.06.2024