

INTEGRAL EQUATIONS

1	Course Title:	INTEGRAL EQUATIONS	
2	Course Code:	MAT4032	
3	Type of Course:	Optional	
4	Level of Course:	First Cycle	
5	Year of Study:	4	
6	Semester:	8	
7	ECTS Credits Allocated:	6.00	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Dr. Öğr. Üyesi NISA ÇELİK	
15	Course Lecturers:	Yrd.Doç.Dr.Setenay DOĞAN Yrd.Doç.Dr.Nisa ÇELİK Yrd.Doç.Dr.Sezai HIZLIYEL Yrd.Doç.Dr.Emrullah YAŞAR	
16	Contact information of the Course Coordinator:	caglayan@uludag.edu.tr 0 224 2941752 U.Ü. Fen Edebiyat Fak. Mat.Böl. Görükle Yerleşkesi, Nilüfer BURSA	
17	Website:		
18	Objective of the Course:	To introduce the concept of integral equation and give some applications	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	Learns the modelling of some events as an integral equations
		2	Understands the relationship between integral and differential equations.
		3	Learns to get solutions of some integral equations.
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21	Course Content:		
		Course Content:	
Week	Theoretical	Practice	
1	Preliminary information. Definition, classification, Fredholm and Volterra equations, the concept of solution		

2	Fredholm integral equation of second kind with degenerate kernel. Reducing to system of algebraic equations, obtaining of the solution in case λ is not an eigenvalue. Resolvent kernel. Exercises.	
3	Homogeneous Fredholm equation, eigenvalues and eigenfunctions. Exercises.	
4	Adjoint homogeneous and inhomogeneous Fredholm equations. Existence of the solutions in case λ is an eigenvalue	
5	Successive substitutions method, the applications of the method to Fredholm and Volterra equations.	
6	Iterated kernels and resolvent kernels. Neumann series. Exercises.	
7	Method of successive approximations. Applications of the method to Fredholm and Volterra equations. Exercises.	
8	Midterm exam, general review	
9	Classical Fredholm theory in case an arbitrary kernel.	
10	Obtaining of the solutions in case λ is not an eigenvalue.	
11	Existence of solutions in case λ is an eigenvalue	

Activities		Number	Duration (hour)	Total Work Load (hour)
14	Theoretical General exercises.	14	3.00	42.00
Practicals/Labs		0	0.00	0.00
22	Textbooks, References and/or Other Materials.	Linear Integral Equations William Vernon Lovitt	4.00	56.00
Homeworks		14	4.00	56.00
23	Assessment Projects	0	0.00	0.00
Field Studies		0	0.00	0.00
Midterm exams		1	12.00	12.00
Others		0	0.00	0.00
Final Exams		1	14.00	14.00
Home work-project		0	0.00	
Total Work Load				180.00
Total work load/ 30 hr		2	100.00	6.00
ECTS Credit of the Course				6.00
Success Grade				
Contribution of Final Exam to Success Grade		60.00		
Total		100.00		
Measurement and Evaluation Techniques Used in the Course				

24 ECTS / WORK LOAD TABLE

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	2	3	1	2	4	1	4	4	3	1	0	0	0	0	0	0

ÖK2	3	2	1	2	4	1	3	4	2	1	0	0	0	0	0	0
ÖK3	2	3	1	2	5	1	3	4	2	1	0	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	1 very low			2 low			3 Medium			4 High			5 Very High			