AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Numerical Solution of Integral Equations								
Course Code	MTK528		Couse Level		Second Cycle (Master's Degree)				
ECTS Credit	8	Workload	200 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	This course aims to acquaint students with the basic knowledge of numerical solution of some kinds of integral equations. Students will be familiar with classification of equations Volterra and Fredholm method of solutions. They may easily understand the features of topics used at the area of information other courses. They will be able to make applications related to biology, and other sciences.								
Course Content	Numerical solution and stability of Volterra integral equations, Linear and non-linear integro-differential equations, Numerical solution of integro-differential equations with parabolic type., Numerical solution of integro-differential equations with parabolic Volterra type, stability analysis.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Individual Study, Problem Solving								
Name of Lecturer(s)									

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	50
Assignment	1	20

Recommended or Required Reading	
1	Ram P. KANWAL (1971) Lineer integral denklemler (Linear Integral Equations), Academic Pres, New York and London
2	Villiam Vernon LOVITT (1950) Lineer integral denklemler (Linear Integral equations), Dower publications, New York.
3	Yavuz AKSOY (1983) İntegral Denklemler (Integral Equations), Yıldız üniversitesi yayınları

Week	Weekly Detailed Course Contents	
1	Theoretical	Introduction of MATLAB and integral equations
2	Theoretical	Relation between linear differential equations and integral equations with Fredholm and Volterra integral equations
3	Theoretical	Relation between linear differential equations and integral equations with Fredholm and Volterra integral equations
4	Theoretical	Linear and nonlinear integro-differential equations
5	Theoretical	Numerical solution and stability of Volterra integral equations, Linear and non-linear integro-differential equations
6	Theoretical	Linear and non-linear integro-differential equations, Linear and Nonlinear Volterra integral equations of the second kind
7	Theoretical	Volterra integral equations with time lags
8	Intermediate Exam	Midterm exam
9	Theoretical	Lotka-Volterra systems
10	Theoretical	Numerical solution of integro-differential equations with parabolic type.
11	Theoretical	Numerical error analysis
12	Theoretical	Numerical solution of integro-differential equations with parabolic Volterra type.
13	Theoretical	Numerical solution of integro-differential equations with parabolic Volterra type.
14	Theoretical	Numerical stability analysis
15	Theoretical	Numerical stability analysis
16	Final Exam	FINAL EXAM

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Assignment	1	20	2	22
Midterm Examination	1	40	2	42

Final Examination	1	50	2	52
			Total Workload (Hours)	200
			[Total Workload (Hours) / 25*] = **ECTS**	8
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To be able to comprehend integral equations.
2	To be able to solve actual and numerical integral equations.
3	To be able to prepare stability analysis.
4	To be able to write computer programming.
5	To be able to use mathematical concepts in solving certain types of problems

Programme Outcomes *(Mathematics Master)*	
1	To be able to have an adequate theoretical and practical domain knowledge.
2	To be able to comprehend the interdisciplinary interaction associated with Mathematics.
3	To be able to use theoretical and practical domain knowledge gained in the field of Mathematics.
4	To be able to interpret knowledge from different disciplines integrating knowledge in the field of mathematics and produce new information.
5	To be able to define, analyse, model and to solve the problems by scientific methods in Mathematics.
6	To be able to conduct a math related specialistic study independently.
7	To be able to develop new strategic approaches to solve problems occurred in unforeseen and complex math-related applications by taking responsibility.
8	To be able to lead in situations that require solving problems related to the mathematics.
9	To be able to criticize his/her knowledge and skills acquired in the field mathematics.
10	To be able to transfer his/her ideas and suggestions for solutions to problems by supporting quantitative or qualitative data verbally and in writing.
11	To be able to communicate both orally and written in a foreign language.
12	To be able to use computer hardware and information technologies with software required by Mathematics.
13	To be able to contribute to the solution of the social, scientific, cultural and ethical problems related to the Mathematics, and being able to support the development of social, scientific, cultural and ethical values.
14	To be able to develop mathematics-related strategies, policies and operational plans, and to evaluate the results obtained within the framework of quality processes.
15	To be able to use his/her knowledge in the field of mathematics and practical problem-solving skills in interdisciplinary studies.

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5
P1	3	4	4	4	4
P2	3	4	4		
P3	3	4	4	4	4
P4	3	4	4		
P5		4	4		
P7		4	4		
P12	3			5	3
P15	4	4	4	3	4