AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title		Graph Theory I						
Course Code		MTK545		Couse Level		Second Cycle (Master's Degree)		
ECTS Credit	8	Workload	200 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The aim of this course is to provide students with the fundamental concepts of graph theory and the ability of solving problems by applying graph theoretical methods.						
Course Content		Graphs, subgraphs, isomorphic graphs, connected graphs, weighted graphs, distance in graphs, shortest path problems, Eulerian and Hamiltonian graphs, Chinese postman problem, travelling salesman problem, planar graphs, Kuratowski's theorem, coloring, chromatic number, four color theorem, directed graphs, tournaments, Eulerian and Hamiltonian directed graphs, orientable graphs, independent sets.						
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	R. Diestel, Graph Theory, Springer, 2017.
2	J.A. Bondy and U.S.R. Murty, Graph Theory, Springer, 2008.

Week	Weekly Detailed Course Contents	
1	Theoretical	Graphs and Subgraphs
2	Theoretical	Trees and Connectivity
3	Theoretical	Weighted Graphs
4	Theoretical	Distance in Graphs
5	Theoretical	Shortest Path Problems
6	Theoretical	Eulerian and Hamiltonian Graphs
7	Theoretical	Chinese Postman Problem, Travelling Salesman Problem
8	Theoretical	Planar Graphs, Kuratowski's Theorem
9	Intermediate Exam	MIDTERM EXAM
10	Theoretical	Coloring, Chromatic Number, Four Color Theorem
11	Theoretical	Directed Graphs
12	Theoretical	Tournaments
13	Theoretical	Eulerian and Hamiltonian Directed Graphs
14	Theoretical	Orientable Graphs
15	Theoretical	Independent Sets
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	Ability to understand the fundamental concepts of graph theory.
2	Ability to solve the problems by applying graph theoretical methods. V
3	Ability to determine whether a graph is planar.
4	Ability to determine the chromatic number a graph.
5	Ability to understand the notion directed graph.

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	4	4	3		4
P2	2	2	3	2	3
P3	3	4	4	2	3
P4	3	3	4	3	3
P5	2	2	3	2	3
P10	3	3	4		3
P15	4	3	4	2	3