AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Graph Theory								
Course Code	MTK629		Couse Level	Third Cycle (Doctorate Degree)					
ECTS Credit	7.5	Workload	188 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The purpose of course is to teach the standard uses of graphs as models and the fundamental theory about graphs. Also, the course aims to gain the ability of researching in this field in both theoretically and practically.								
Course Content	Overview of graph theory, Eulerian and Hamiltion Graphs, Digraphs, Matrix representation of graphs, Tree structures, Counting trees, Greedy algorithms, Path algorithms,, Paths and connectivity, Planarity, Vertex and edge coloring and decompositions, Flows.								
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	Graph Theory, Reinhard Diestel, Springer, 2005.
2	"Graphs and Applications: An Introductory Approach ", 4th edition, Joan M. Aldous, Robin J. Wilson, Springer, 2004.

Week	Weekly Detailed Course Contents	
1	Theoretical	Overview of graph theory
2	Theoretical	Eulerian and Hamiltion Graphs
	Preparation Work	Relevant part of course book should be read.
3	Theoretical	Digraphs
	Preparation Work	Relevant part of course book should be read.
4	Theoretical	Matrix representation of graphs
	Preparation Work	Relevant part of course book should be read.
5	Theoretical	Tree structures
	Preparation Work	Relevant part of course book should be read.
6	Theoretical	Counting trees
	Preparation Work	Relevant part of course book should be read.
7	Theoretical	Greedy algorithms
	Preparation Work	Relevant part of course book should be read.
8	Theoretical	Path algorithms
	Preparation Work	Relevant part of course book should be read.
9	Preparation Work	All subjects covered
	Intermediate Exam	MIDTERM EXAM
10	Theoretical	Paths and connectivity
	Preparation Work	Relevant part of course book should be read.
11	Theoretical	Planarity
	Preparation Work	Relevant part of course book should be read.
12	Theoretical	Vertex coloring and decompositions
	Preparation Work	Relevant part of course book should be read.
13	Theoretical	Edge coloring and decompositions
	Preparation Work	Relevant part of course book should be read.
14	Theoretical	Flows
	Preparation Work	Relevant part of course book should be read.

15	Preparation Work	All subjects covered
	Final Exam	FINAL EXAM

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	4	3	98
Assignment	1	0	26	26
Midterm Examination	1	25	2	27
Final Examination	1	35	2	37
			Total Workload (Hours)	188
			[Total Workload (Hours) / 25*] = **ECTS**	7.5

**25 hour workload is accepted as 1 ECTS*

Learning Outcomes

1	Ability to understand fundamental concepts of graph theory
2	Ability to construct a graph model for a given problem
3	Ability to solve the given problem with graph algorithms
4	To be able to gain the skill of interpreting some interrelations among these concepts
5	To be able to use mathematical concepts in solving certain types of problems

Programme Outcomes *(Mathematics Doctorate)*

1	To be able to develop the current and advanced knowledge of mathematics domain to expertise level by an original idea or research, based on the level of its knowledge at the graduate level, and to be able to reach original definitions that will bring innovation to Mathematics.
2	To be able to comprehend the interdisciplinary interaction associated with Mathematics.
3	To be able to use and evaluate the new knowledge in the field of Mathematics with a systematic approach.
4	To be able to develop an idea, a method, a design or an application that will bring innovation to Mathematics, to use well known ideas, methods, designs or applications on a different research area, or to search, comprehend, design, adapt and apply an original subject matter.
5	To be able to criticize, analyze, synthesize and evaluate new and complex ideas.
6	To be able have high-level skills in research methods related to studies on Mathematics.
7	To be able to expand the frontiers knowledge in the field of Mathematics via generating or interpreting an original study, or publishing at least a scientific paper in national/international refereed journals.
8	To be capable of leadership in the positions that require the analyses of problems related to the field of Mathematics.
9	To be able to defend his/her original ideas among the experts in the discussion of math related issues, and to be able to communicate effectively to show his/her competence in the field of Mathematics.
10	To be able to contribute to the solution of the social, scientific, cultural and ethical problems related to the Mathematics, and to be able to support the development of social, scientific, cultural and ethical values.
11	To be able to have both oral and written communication using a foreign language.

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	5	4	4	4
P2	5	5	4	4	4
P3	4	5	4	4	4
P4	3	4	4	4	4
P5		4	4	4	4
P6	4	4	4	4	4