AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Algebraic Topology I								
Course Code	MTK531		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	8	Workload	200 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The purpose of this course is to present the students with the subjects in the course content at the graduate level.								
Course Content	Surfaces, orientable and nonorientable surfaces, Euler characteristic of a surface, homotopy and homotopy of paths, covering spaces, fundamental groups, Van Kampen theorem, Chain homotopy and higher homotopy groups.								
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	Massey, W.S. (1967) Algebraic Topology, Springer.
2	Fulton, W. (1995) Algebraic Topology, Springer.

Week	Weekly Detailed Course Contents	
1	Theoretical	Overview of Algebraic Topology and Preliminaries
2	Theoretical	Surfaces, orientable and nonorientable surfaces
3	Theoretical	Compact and noncompact surfaces
4	Theoretical	Genus and Euler charactesistic of a surface
5	Theoretical	Classification theorem for compact surfaces
6	Theoretical	Homotopy and homotopy of paths
7	Theoretical	Covering spaces
8	Theoretical	Fundamental group
9	Intermediate Exam	MIDTERM EXAM
10	Theoretical	Fundamental group of the sphere, the plane and the circle
11	Theoretical	Fundamental groups of orientable and nonorientable surfaces
12	Theoretical	Topological invariance and homotopy invariance
13	Theoretical	Van Kampen theorem
14	Theoretical	Higher homotopy groups
15	Theoretical	Chain homotopy
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 explain the concepts of surface and classification theorem
2	To be able to define the concept of homotopy and homotopy of paths
3	To be able to explain the concept of covering spaces
4	To be able to determine the fundamental group of a given surface
5	To be able to explain the Van Kampen theorem and its applications
6	To be able to determine the higher homotopy groups

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	L6
P1	3	3	3	3	3	3
P2	4	4	4	4	4	4
P3	3	3	3	3	3	3
P4	1	1	1	1	1	1
P5	1	1	1	1	1	1
P9	3	3	3	3	3	3
P14	2	2	2	2	2	2
P15	1	1	1	1	1	1