

COURSE PROFILE

Course Name	Code	Semester	Term	Theory +PS+Lab. (hour/week)	Local Credits	ECTS
Introduction to Topology	MATH 464	Spring	8	3+0+0	3	8

Prerequisites	None
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Course Language	English
Course Type	Elective
Course Lecturer	
Course Assistant	
Course Objectives	The aim of the course is to introduce students to the elements of general topology, topological spaces, continuous functions, connectedness, compactness, completeness, separation axioms and metric spaces.
Course Learning Outcomes	By the end of the course the students should be able to: <ol style="list-style-type: none"> 1. to recognize metric spaces and topological spaces, understand the distinction between topological and metric properties, and handle a variety of topological properties 2. to work with continuous functions, and to recognize whether spaces are connected, compact or complete 3. to prove elementary theorems involving the concepts of topological space, continuous function, compactness, and connectedness
Course Content	Elementary concepts. Metric spaces, Spaces of continuous functions. The definition and some examples of topological spaces. Open bases and open subbases, weak topologies. Connected spaces; totally disconnected spaces, locally connected spaces. Compact spaces; Tychonoff's theorem, locally compact spaces. T_1 spaces and Hausdorff spaces, completely regular spaces and normal spaces. Urysohn's lemma and the Tietze extension theorem.

COURSE CONTENT

Week	Subjects	Related Preparation
1	Fundamental Concepts, Functions, Relations	Chapter 1
2	The Integers and the Real Numbers, Cartesian products,	Chapter 1

3	Finite sets, Countable and Uncountable sets,	Chapter 1
4	Infinite sets and the Axiom of Choice, Well-Ordered sets	Chapter 1
5	Topological spaces, Basis for a Topology,	Chapter 2
6	The order topology, The product topology on $X \times Y$,	Chapter 2
7	The subspace topology, Closed sets and Limit points,	Chapter 2
8	Continuous functions,	Chapter 2
9	The product topology	Chapter 2
10	The metric topology	Chapter 2
11	Connected spaces, Connected subspaces of the Real line	Chapter 3
12	Compact spaces, Compact subspaces of the Real Line	Chapter 3
13	Limit Point compactness	Chapter 3
14	Local compactness	Chapter 3

Course Textbooks	James R. Munkres: Topology, second edition, Pearson.
Recommended References	B. Mendelson, Introduction to Topology, Courier Dover Publications, 1990. M.A. Armstrong, Basic Topology, Springer, 1997. T.W. Gamelin and R.E. Greene, Introduction to Topology, Courier Dover Publications, 1999

Semester Requirements	Number	Percentage of Grade
Attendance/Participation	1	5
Laboratory	-	-
Application	-	-
Special Course Internship (Work Placement)	-	-
Quizzes/Studio Critics	-	-

Homework Assignments	13	-
Presentation	-	-
Project	-	-
Seminar/Workshop	-	-
Midterms/Oral Exams	2	60
Final/Resit Exam	1	35
Total	17	100

PERCENTAGE OF SEMESTER WORK	16	65
PERCENTAGE OF FINAL WORK	1	35
Total	17	100

Course Category	Core Courses	
	Major Area Courses	X
	Supportive Courses	
	Media and Management Skills Courses	
	Transferable Skill Courses	

COURSE'S CONTRIBUTION TO PROGRAM

#	Program Qualifications / Outcomes	* Level of Contribution				
		1	2	3	4	5
1	To have a grasp of basic mathematics, applied mathematics and theories and applications of statistics.				X	
2	To be able to use theoretical and applied knowledge acquired in the advanced fields of mathematics and statistics,					X
3	To be able to define and analyze problems and to find solutions based on scientific methods,					X
4	To be able to apply mathematics and statistics in real life with interdisciplinary approach and to discover their potentials,					X
5	To be able to acquire necessary information and to make modeling in any field that mathematics is used and to improve herself/himself,					X

6	To be able to criticize and renew her/his own models and solutions,					X
7	To be able to tell theoretical and technical information easily to both experts in detail and nonexperts in basic and comprehensible way,				X	
8	To be able to use international resources in English and in a second foreign language from the European Language Portfolio (at the level of B1) effectively and to keep knowledge up-to-date, to communicate comfortably with colleagues from Turkey and other countries, to follow periodic literature,				X	
9	To be familiar with computer programs used in the fields of mathematics and statistics and to be able to use at least one of them effectively at the European Computer Driving Licence Advanced Level,		X			
10	To be able to behave in accordance with social, scientific and ethical values in each step of the projects involved and to be able to introduce and apply projects in terms of civic engagement,				X	
11	To be able to evaluate all processes effectively and to have enough awareness about quality management by being conscious and having intellectual background in the universal sense,				X	
12	By having a way of abstract thinking, to be able to connect concrete events and to transfer solutions, to be able to design experiments, collect data, and analyze results by scientific methods and to interfere,					X
13	To be able to continue lifelong learning by renewing the knowledge, the abilities and the competencies which have been developed during the program, and being conscious about lifelong learning,				X	
14	To be able to adapt and transfer the knowledge gained in the areas of mathematics and statistics to the level of secondary school,				X	
15	To be able to conduct a research either as an individual or as a team member, and to be effective in each related step of the project, to take role in the decision process, to plan and manage the project by using time effectively.				X	

*1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION

Activities	Number	Duration (Hours)	Total Workload
Course Hours (Including Exams)	14	3	48
Tutorials	-	-	-
Laboratory	-	-	-

Application	-	-	-
Special Course Internship (Work Placement)	-	-	-
Field Work	-	-	-
Study Hours Out of Class	14	4	56
Presentations / Seminar	-	-	-
Project	-	-	-
Preparatory reading	13	2	26
Homework Assignments	13	4	52
Quizzes	-	-	-
Midterm Exams	2	4	8
Final / Resit Exam	1	10	10
		Total Workload	200

COURSE CATEGORY

ISCED GENERAL AREA CODES	GENERAL AREAS	ISCED BASIC AREA CODES	BASIC EDUCATIONAL AREAS	
1	Education	14	Teacher Training and Educational Sciences	0
2	Humanities and Art	21	Art	0
2	Humanities and Art	22	Humanities	0
3	Social Sciences, Management and Law	31	Social and Behavioral Sciences	0
3	Social Sciences, Management and Law	32	Journalism and Informatics	0
3	Social Sciences, Management and Law	38	Law	0
4	Science	42	Life Sciences	0
4	Science	44	Natural Sciences	0
4	Science	46	Mathematics and Statistics	100
4	Science	48	Computer	0

5	Engineering, Manufacturing and Civil	52	Engineering	0
5	Engineering, Manufacturing and Civil	54	Manufacturing and Processing	0
5	Engineering, Manufacturing and Civil	58	Architecture and Structure	0
6	Agriculture	62	Agriculture, Forestry, Livestock, Fishery	0
6	Agriculture	64	Veterinary	0
7	Medicine and Welfare	72	Medical	0
7	Medicine and Welfare	76	Social Services	0
8	Service	81	Personal Services	0
8	Service	84	Transport Services	0
8	Service	85	Environment Protection	0
8	Service	86	Security Services	0