Detailed Course Description - Course Plan Development and Updating Procedures/ Mathematics **Department**	**QF01/0408-3.0E**

Faculty	Faculty of Science and Information Technology	Department	Mathematics
Course number	0101432	Course title	Topology
Number of credit hours	3	Pre-requisite/co-requisite	**Real Analysis 1** 0101251

Brief course description

Topological Spaces, Open and Closed Sets, Interior Points, Boundary Points, Limit Points, Closure Sets, Subspace Topology, Bases and Subbases, Continuous Functions, Homeomorphisms, Hausdroff Space, Separation Axioms, The metrizability, Connected Space, Compact Spaces, Metric Spaces.

	Course goals and learning outcomes
Goal 1	Students will learn the fundamentals of point-set topology.
Learning outcomes	1.1 Students will know the definitions of standard terms in topology. 1.2 Students will know how to read and write proofs in topology. 1.3 Students will know a variety of examples and counterexamples in topology.
Goal 2	To provide students with a good understanding of the Topology and it is basic concepts.
Learning outcomes	2.1 The student will be able to distinguish among open and closed sets on different topological spaces 2.2 The student will be able to know many fundamental topologies. 2.3 The student will be able understand when two topological spaces are homeomorphic. 2.4 The student will be able to identify the concepts of distance between two sets; connectedness, denseness, compactness and separation axioms.
Goal 3	Students will be prepared to begin thesis research.
Learning outcomes	3.1 Students will be able to work with new ideas in mathematics. 3.2 Students will be able to clearly communicate ideas and proofs.

Textbook	An introduction to General Topology. By: Paul E. Wong
Supplementary references	1) Topology. By: James Munkers 2) Topology. By: Zeeman 3) Introduction to Topology. By: Bert Mendelson. 4) Topology By: J Dugundji

Course timeline				
Week	**Number of hours**	**Course topics**	**Pages (textbook)**	**Notes**
01	**1 1 1**	Topology and topological spaces Examples of topological spaces, the ray topology, the co-finite topology.	61 – 68	
02	**1 1 1**	The usual topological space, the definition of open sets and closed sets With their properties.	69 - 72	
03	**1 1 1**	Redefine the topological space by means of open sets and closed sets	80 – 82	
04	**1 1 1**	The definition of interior points. And prove some important properties.	82 – 84	
05	**1 1 1**	The definition of a limit point of a subset A and prove some important properties.	84 – 87	
06	**1 1 1**	The definition of the closure of a subset A. And prove some important properties. **First Exam 20%**	87 – 90	
07	**1 1 1**	The subspace of a topology, the relative topological space. The separation axioms.T0, T1, T2 spaces.	78 – 80 136 – 142	
08	**1 1 1**	T2 space is T1 space while the converse is not always true, the topological space is T1 space if and only if each singleton is closed.	142 – 144	
09	**1 1 1**	Continuous functions and homeomorphisms with the def. of a topological property.	113 – 120	
10	**1 1 1**	Bases and subbases, definitions, examples proving theorems involving these notions.	92 – 96	
11	**1 1 1**	Connected spaces .Connectedness is a topological property.	191 – 198	
12	**1 1 1**	Compact spaces. **Second Exam 20%**	210 – 216	
13	**1 1**	The Heine –Boral theorem. Proving that compact subset of T2 space is closed and closed subset of	220 – 224	

	1	compact is compact.		
14	1 1 1	Metric spaces.	243 – 250	
15	1 1 1	The metrizability	236 – 243	
16	1 1 1	**Final Exam 50%**	-	

Theoretical course evaluation methods and weight	Participation = 10% First exam 20% Second exam 20% Final exam 50%	**Practical (clinical) course evaluation methods**	Semester students' work = 50% (Reports, research, quizzes, etc.) Final exam = 50%

Approved by head of department		**Date of approval**	

Extra information (to be updated every semester by corresponding faculty member)

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Office hours			