Course Specifications

Course Title:	G e n e r al Topology
Course Code:	(4044602-3)
Program:	**BSc. Mathematics**
Department:	Mathematical Science
College:	Applied Science
Institution:	Umm Al-Qura University

Table of Contents

A. Course Identification

1. **Credit hours:**				
2. Course type				
a. University ☐	College ☐	Department **x**		Others ☐
b. Required **x**		Elective ☐		
3. Level/year at which this course is offered: 7th level				
4. Pre-requisites for this course (if any): Real Analysis (1) (4043102-3)				
5. Co-requisites for this course (if any):				

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	45
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	Total	45
Other Learning Hours*		
1	Study	
2	Assignments	
3	Library	
4	Projects/Research Essays/Theses	
5	Others(specify)	
	Total	

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

1.1. Definition of topological spaces and giving many examples .

1.2. Distinguish between open and closed subsets in topological spaces.

1.3. Introducing the concepts of interior, exterior, limit and boundary points and studying their properties. Also introducing the concepts of bases and the subspaces of a given Topology.

1.4 Studying the concepts of continuous, open and closed mappings between topological spaces and their properties.

1.5 Knowledge of topological equivalence concept and topological property.

1.6 Introducing the concepts of compact and connected topological spaces with examples

1.7 Defining separation axioms on topological spaces (examples and properties).

2. Course Main Objective

- **Be able to deal with different topological spaces and with some types of points such as interior, isolated, boundary and accumulation points.**
- **Be Familiar with the concepts of open ,closed sets and continuous mappings.**
- **Understand the concepts of basis and relative topology.**
- **Deal with open and closed mappings.**
- **Study the concepts of separations axioms.**

Be familiar with the concept of topological property and hereditary property with its applications.

3. Course Learning Outcomes

	CLOs	AlignedPLOs
1	**Knowledge:**	
1.1	Improve the ability of formulating a true proofs	
1.2	Have the ability of making a right mathematical expression	
1.3	Define a topological space, describe the standard examples of topological spaces from the course and demonstrate that they meet the definition	
1.4	Define continuous function between topological spaces and demonstrate equivalence of alternative definitions	
2	Skills	
2.1	Distinguish between mathematical concepts	
2.2	Study topological equivalence and topological property.	
2.3	Study compact spaces, connected spaces and considering their properties.	
2.4	Study separation axioms and their properties.	
2.5	recognize the basic concepts of topology	
2.6	be able to determine whether a given space is connected or not, to generate a continuous mapping, and to understand the topological equivalence and topological property on topological spaces.	
3	**3 Competence:**	
3.1	Punctual attendance of classes is required.	
3.2	Students should demonstrate their sense of responsibility for learning by completing both reading and writing assignments in due time. Students learn to manage their time.	
3.3	Accustom students to take responsibility of self –learning	

CLOs		AlignedPLOs
3.4	Students should act responsibly and ethically in carrying	

C. Course Content

No	List of Topics	Contact Hours
1	Topological Spaces: Definitions and examples.	6
2	Closed sets – Interior, closure and boundary of a set in topological spaces.	6
3	Bases and sub bases of a given topology – Relative topology and subspaces.	6
4	Continues functions: Examples - Classification of continuous functions– Topological equivalence and topological properties	9
5	Compactness and connectedness of topological spaces (definitions and examples)	9
6...	Separation axioms (T_o, T_1, T_2, Regular and normal spaces)- Definitions, examples and properties-Hereditary property.	9
	Total	

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
1.0	**Knowledge**		
1.1	Improve the ability of formulating a true proofs	Lectures Tutorials Discussion Problem Solving	Exams Homework
1.2	Have the ability of making a right mathematical expression		
1.3	Define a topological space, describe the standard examples of topological spaces from the course and demonstrate that they meet the definition		
1.4	Define continuous function between topological spaces and demonstrate equivalence of alternative definitions		
2.0	**Skills**		
2.1	Distinguish between mathematical concepts	Homework consisting in solving selected exercises.

Encourage and develop self - education | Homework Oral and written tests. Research projects |
2.2	Study topological equivalence and topological property.		
2.3	Study compact spaces, connected spaces and considering their properties.		
2.4	Study separation axioms and their properties.		
2.5	recognize the basic concepts of topology		
2.6	be able to determine whether a given		

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
	space is connected or not, to generate a continuous mapping, and to understand the topological equivalence and topological property on topological spaces.		
3.0	**Competence**		
3.1	Punctual attendance of classes is required.	Discussion. Explanation. Guidance and supervision of the group Assignments for research projects.	Home work. Reports. Quizzes. Discussion
3.2	Students should demonstrate their sense of responsibility for learning by completing both reading and writing assignments in due time. Students learn to manage their time.		
3.3	Accustom students to take responsibility of self –learning		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterm 1	6th week	20%
2	Midterm 2	10th week	20%
3	Homework + reports + Quizzes	During the semester	20%
4	Final exam	End of semester	40%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

1- Office hours per week in the lecturer schedule (3 hours per week).

2- Contact with students by e-mail,SMS, and e-learning facilities.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Mícheál O'Searcoid, Metric Spaces, Springer Undergraduate Mathematics Series, 2007
Essential References Materials	Schaum's outline of theory and problems of general topologyS Lipschutz - 1965 - wuve.pw

Electronic Materials	Website ,http://ebookee.org/
Other Learning Materials	**such as computer-based programs/CD, professional standards/regulations:**Microsoft Word

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	-Classroom with capacity of 30-students. - Library.
Technology Resources (AV, data show, Smart Board, software, etc.)	Available
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes,Quality oflearning resources, etc.)
Evaluators (Students,Faculty, Program Leaders,Peer Reviewer, Others (specify)
Assessment Methods(Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	