Course Specification

(Postgraduate)

Course Title: **General Topology II**
Course Code: **MATH649**
Program: **Master Program in Mathematics**
Department: **Mathematics**
College: **Science**
Institution: **University of Tabuk, KSA**
Version: **2**
Last Revision Date: **1/12/1443 H**

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	3 H				
2. Course type					
a.	University ☐	College ☐	Department ☒	Track☐	Others☐
b.	Required ☐	Elective ☒			
3. Level/year at which this course is offered: Level-2 or higher					
4. Course general Description					
Paracompactness, Properties of paracompact spaces, Types of refinements, Stone's coincidence theorem, Function spaces, Convergence and completeness, Metrization, Uryohn's lemma, Tietz's extension theorem, Tychonoff theorem, Topological n-manifolds, Direct and inverse systems of topological spaces.					
5. Pre-requirements for this course (if any): MATH636					
6. Co- requirements for this course (if any): None					
7. Course Main Objective(s)					

- To give the students insight into basic ideas and advanced methods of general topology.
- To understand the concepts of compactness and paracompactness.
- To solve topological problems using advanced methods.
- To apply theoretical concepts in general topology to understand real-world applications.

Upon completion of the course, students will be able to:

1. Understand terms, definitions and theorems related to advanced general topology.
2. Apply theoretical concepts in this course to understand real-world applications.
3. Demonstrate knowledge and understanding of concepts such as compactness and paracompactness.
4. Use of critical thinking in solving complex problems and theorems in this course's general topology.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	**45**	**100 %**
2.	E-learning		
3.	Hybrid • Traditional classroom		

No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	**3 H /week**
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding The students will be able to:			
1.1	Demonstrate the basic concepts and important results in this advance course of General Topology.	K1	Lectures, Group works, Presentations, Classroom discussions, Seminar, Case studies, problem-solving session	Exams, Quizzes, Research projects, presentations, interactive discussion, and participation, Survey
1.2	Describe advance methods and selected topics in the field of General Topology.	K2		
1.3	Enhance an understanding to handle methods, examples and solutions of problems of this subject.	K3		
2.0	Skills The students will be able to:			
2.1	Apply and justify the analytical procedures in proving theorems in this advance course of General Topology.	S1	Lectures, Group works, Presentations, Classroom discussions, Seminar, Case studies, problem-solving session	Exams, Quizzes, Home works, Assignments, Research project, presentation,
2.2	Using and applying the rules and results that they have learnt in this course to solve	S3		

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	complex problems.			interactive discussion and participation, Surveys.
2.3	Communicate the theorems and results in practical examples.	S4		
2.4				
3.0	Values, autonomy, and responsibility The students will be able to:			
3.1	Perform work professionally and ethically.	V1	Lectures, Group works, Presentations, Classroom discussion, Seminar, Case study, problem solving session	Research project, Home works, Assignments, presentation, interactive discussion and participation, Surveys.
3.2	Demonstrate responsibility work independently and in groups. .	V2		
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C. Course Content

No	List of Topics	Contact Hours
1	Introduction to advancement in general topology	3
2	Paracompactness -Types of refinements	3
3	Paracompactness in terms of open locally finite refinements	3
4	properties of paracompact spaces with regard to subspaces	3
5	properties of paracompact spaces with regard to product etc.	3
6	Stone's coincidence theorem	3
7	Function Spaces – Point-wise convergence topology and uniformity	3
7	**Mid-Exam #**	-
8	compact-open topology, uniqueness of jointly continuous topology,	3
9	uniform convergence on a family of sets,	3
10	Completeness	3
11	Metrization, Uryohn's lemma	3
12	Tietz's extension theorem	3
13	Tychonoff theorem	3
14	Topological n-manifolds	3

15	Direct and inverse systems of topological spaces	3
16+17	**Review & Final Exam**	
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Home works and Assignments	Weekly basis	20%
2.	Mid-term exam	6th week	25%
3.	Presentation and discussion	During the Semester	15%
4.	Final Exam	At End of Semester	40 %

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	**1.** Francisco Bulnes, Advanced Topics of Topology, IntechOpen (2022)
Supportive References	**2.** Adams and Franzosa, Introduction to Topology: Pure and Applied, Pearson-Prentice Hall, (2007)
Electronic Materials	**3.** DSL
Other Learning Materials	**4.** NA

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture Room with capacity of 30 students and equipped with White Board, Library
Technology equipment (projector, smart board, software)	Overhead projector and internet connection.
Other equipment (depending on the nature of the specialty)	NA

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Direct and Indirect
Effectiveness of students assessment	Teacher	Direct
Quality of learning resources	Students	Indirect
The extent to which CLOs have been achieved	Teacher, Quality Committee	Direct and Indirect
Other	NA	NA

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

Council / Committee	**Approval by the Department Council**
Reference No.	DEPARTMENT COUNCIL NO (26)
Date	**11/9/1444 H**