Faculty: Science	
Department: Mathematics	**Program: Bachelor's**

Course Plan

First: Course Information

Course No. **0301361**	***Course Title:*** **General Topology 1**	***Credit Hours:*** **3**
Prerequisite: **Logic & Set Theory**	***Section No.*:** **1**	***Lecture Time:*** **9:00-10:00**
Type Of Course:	☐ ***Obligatory Faculty Requirement*** ☐ ***Elective University Requirement*** ☐ ***Obligatory University Requirement*** ☐ ***Faculty Requirement*** ☐ ***Course Elective Specialty Requirement*** ■ ***Obligatory Specialization requirement***	
Type of Learning:	■ ***Face-to-Face Learning*** ☐ ***Blended Learning (2 Face-to-Face + 1Asynchronous)*** ☐ ***Online Learning (2 Synchronous+1 Asynchronous)***	

Third: Course Description

Topological spaces, open and closed sets, boundary, interior and accumulation points, subspace topology, basis and sub-basis, finite product of topological spaces, continuous functions, open and closed functions, homeomorphisms, Separation and countability axioms, compact spaces, metric spaces.

Fourth: Course Objectives

General Topology is one of the major branches of modern mathematics; this one-semester three-credit course will have three general interconnected objectives.

1. Will provide a firm foundation in topology to enable the student to continue more advanced study in this area.
2. This course will present and emphasize many topics in mathematics, in particular Real analysis, in order to aid the student in his future mathematical studies.
3. This course hopes to expose the students to both mathematical rigor and abstraction, giving there an opportunity further to develop his mathematical maturity.

Fifth: Learning Source

Main Reference:	An introduction to general Topology	
Author: Paul Long	***Issue No.:*** **4th Edition**	***Publication Year*: 1982**
Additional Sources and Websites:	General Topology by: STEPHEN WILLARD	
Teaching Type:	■ ***Classroom*** ☐ ***Laboratory*** ☐ ***Workshop*** ☐ ***MS Teams*** ☐ ***Moodle***	

Sixth: Learning Outcomes

Level descriptor according to (JNQF)	**CILOs Code**	**CILOs**	**Associated PILOs Code** Choose one PILO for each CILO*	**Assessment method**** Choose at least two methods	**Scores out of 100** State the total score identified for each CILO	**Minimum acceptable Score/percentage (%)** The percentage should not be less than 50% ***
Knowledge	K1	Define and illustrate the concept of topological spaces and continuous functions.	PK2	First Exam, Second Exam, Final Exam, Assignment	10	5 (50%)
	K2	Define and illustrate the concept of product topology and quotient topology.	PK2	First Exam, Second Exam, Final Exam, Assignment	10	5 (50%)
	K3	Define and illustrate the concepts of the separation axioms.	PK3	First Exam, Second Exam, Final Exam, Assignment	8	4 (50%)
	K4	Define connectedness and compactness.	PK4	First Exam, Second Exam, Final Exam,	8	4 (50%)

				Assignment		
Skills	S1	Describe different examples about topological spaces.	PS2	First Exam, Second Exam, Final Exam, Assignment	12	6 (50%)
	S2	Illustrate the applications of learned theories.	PS1	First Exam, Second Exam, Final Exam, Assignment	10	5 (50%)
	S3	Explaining the theories.	PS2	First Exam, Second Exam, Final Exam, Assignment	10	5 (50%)
	S4	Apply the theories in solving problems.	PS3	First Exam, Second Exam, Final Exam, Assignment	8	4 (50%)
	S5	Classify topological spaces and its properties using separation axioms and connectedness.	PS2	First Exam, Second Exam, Final Exam, Assignment	8	4 (50%)
Competencies	C1	Working in a team to handle some advanced topics in number theory	PC3	First Exam, Second Exam, Final Exam, Assignment	4	2 (50%)
	C2	Develop the personal skills and capacity to carry responsibility	PC1	First Exam, Second Exam, Final Exam, Assignment	12	6 (50%)

***Refer to document ( ) and page 2 in document ( )**
**** Refer to document ( )**
****80% of the students must achieve the minimum acceptable percentage or higher for each CILO**

Seventh: Course Structure

Lecture Date	Intended Teaching Outcomes (ILOs)	Topics	Teaching Procedures*	Teaching Methods***	References***
		Introduce to the course			
	K1, K2, S1, S2	Defining a Topology.	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1, K2, S1, S2, C1	Examples on a topological space	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1, K2, S1, S2, C1	Closed sets	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference

	K1, K2, S1, S2, C1, C2	A Closer Look at the Standard Topology on R	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1, K2, K3, S1, S2, C1, C2	Topologies Induced by Functions	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1, K2, K4, S1, S2, C1, C2	The Interior	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1, K2, K4, S1, S2, C1, C2	The Exterior	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1, K2, K3, S1, S2, S3, C1	Boundary of a Set	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1, K2, K5, S1, S2, S4, C1, C2	Cluster Points, Isolated points	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1, K2, K3, S1, S2, S5, C1, C2	Base	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1, K2, K3, S1, S2, S3, C1, C2, C3	Finite Product of Topological Spaces	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	First Exam				
	K1, K2, K3, S1, S2, S3, C1, C2	Subbases	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1, K2, K3, S1, S2, S3, C1, C2	General Products	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1, K2, K3, S1, S2	Continuous function	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2	Open functions	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, C1, C2	Homeomorphisms	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, K4, S1, S2, S3, C1, C2	The identification Topology	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, K4, S1, S2, S3, C1, C2	Quotient spaces	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, K4, S1, S2, S3, C1, C2	The Separation of Axioms	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, K4, S1, S2, S3, C1, C2	Examples on the Separation of Axioms	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, K4, S1, S2, S3, C1, C2	Hausdorff Spaces	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, C1, C2	Regular Spaces	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, C1, C2	Normal Spaces	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, S4, S5, C1, C2	The first Axiom of Countability	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, S4, S5, C1, C2	The second Axiom of Countability	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, K4, S1, S2, S3, C1, C2	Connected Spaces	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, S5, C1, C2	More Properties of Connected Spaces	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, K4, S1, S2, S3, C1, C2	Components	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference

	Second Exam				
	K1,K2, K3, S1, S2, S3, C1, C2	Locally Connected Spaces	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, S4, S5, C1, C2	Compact Spaces	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, S5, C1, C2	More Properties of Compact Spaces	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, S5, C1, C2	Compactness in R^n	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, S5, C1, C2	Non-Continuous functions	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, S5, C1, C2	Defining a matric	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, S5, C1, C2	Metric topologies	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, S5, C1, C2	Equivalent Metric topologies	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, S5, C1, C2	Continuity of functions between Metric spaces	Face-to-Face	Lectures, cooperative learning and discussion	Mean Reference
	K1,K2, K3, S1, S2, S3, S5, C1, C2	Examples of Continuous functions	Face-to-Face	Lectures, cooperative learning and discussion	
	K1, K2, K3, S1, S2, S3, S5, C1	Revision	Face-to-Face	Lectures, cooperative learning and discussion	
	Final Exam				

* Learning procedures: (Face-to-Face, synchronous, asynchronous). * * Teaching methods: (Lecture, video…..). ** * Reference: (Pages of the book, recorded lecture, video….).

Eighth: Assessment methods

Methods	Direct Teaching	Specific Course Output to be measured *State the score identified for each CILO for each method of assessment out of 100 **If any CILO will not be assessed in the course, mark NA.										
		K1	K2	K3	K4	S1	S2	S3	S4	S5	C1	C2
First Exam	20	8				4	5	3				
Second Exam	20			3	4	2	2	2	2	3		2
Final Exam	50	2	10	5	4	4	3	5	4	5		8
Assignment	10					2			2		4	2
Total	100	10	10	8	8	12	10	10	8	8	4	12

Ninth: Course Policies

- All course policies are applied on all teaching patterns (online, blended, and face-to-face Learning) as follows:
  a. Punctuality.
  b. Participation and interaction.
  c. Attendance and exams.
- Academic integrity: (cheating and plagiarism are prohibited).