

Course Description Form

1. Course Name:	
Topology I	
2. Course Code:	
MATH 415	
3. Semester / Year:	
First / 2023-2024	
4. Description Preparation Date:	
23-3-2024	
5. Available Attendance Forms:	
Attendance lectures in the classroom	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours	
7. Course administrator's name (mention all, if more than one name)	
Name: Asst. Prof. Dr. Fadhel Subhi Fadhel Email: fadhel.subhi@nahrainuniv.edu.iq	
8. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • To strength the theoretical mathematical backgrounds of the undergraduate students and to prepare them for the post graduate studies. • To give clear statements of pertinent definitions, principles and theorems together with illustrative descriptive examples. • Improve student's thinking capacity to prove theoretical statements (theorems, propositions, remarks, etc.), which are given as a homework. • Studying the structures, components and properties of different questions, without smooth deformations, so that these properties remain similar under the formation processes related to the tearing process or leaving openings in the transition from one to the other and vice versa, as well. • Generalize all the concepts of real analysis topic. • To cover topics including the basic properties of topological, metric and norms spaces, the separation axioms, compactness, the product topology, and connectedness, as well as, state and prove theorems related to these concepts.
9. Teaching and Learning Strategies	
Strategy	The teaching and learning strategy is considered a set of tools and practices carried out by both the teacher and the student in order to comprehend the academic subject or course, namely topology, in the best possible way. This depends on two basic factors: good transmission by the subject teacher, which is supported by teaching strategies, and good reception by the

student, which is supported by learning strategies. Teaching strategies include a set of organized plans and methods followed by the subject teacher in order to guide students towards achieving learning goals, including cognitive goals for theoretical subjects and skill goals for proving theorems in a mathematical manner through sequential and ordered steps, and emotional and value goals through sensory perception of the operative theorems and results and then their proofs. And how to deal with it. This is done through specific teaching and learning methods in order for the student to acquire general and qualifying skills that are transferable.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Introducing topological spaces and its related definitions, as well as, basic definitions and elementary examples	Topological spaces	Attendance interactive lectures	Ask questions and give assignments
2	4	Give well known examples definitions in topology (indiscrete, discrete, usual and cofinite topologies)	Examples of topological spaces	Attendance interactive lectures	Ask questions and give assignments
3	4	Studying the derived sets and closure of a set	Topological spaces	Attendance interactive lectures	Ask questions and give assignments
4	4	Studying the interior, exterior and the boundary points	Topological spaces	Attendance interactive lectures	Ask questions and give some homework's
5	4	Basis and local bases	Topological spaces	Attendance interactive lectures	Ask questions and give assignments
6	4	Introducing dense and nowhere dense spaces, separated sets	Topological spaces with special properties	Attendance interactive lectures	Ask questions and give assignments
7	4	Introducing connected, disconnected and separated sets	Topological spaces with special properties	Attendance interactive lectures	Ask questions and give assignments
8	4	Continuous, open and closed mappings	Mappings	Attendance interactive lectures	Ask questions and give assignments

9	4	More concepts related continuous, open and closed mappings	Mappings	Attendance interactive lectures	Ask questions, give assignments, and make a 1st attendance mid exam
10	4	Homeomorphisms	Mappings	Attendance interactive lectures	Ask questions and give assignments
11	4	Topological properties and hereditary	Mappings	Attendance interactive lectures	Ask questions and give assignments
12	4	Product Topological Spaces	Mappings	Attendance interactive lectures	Ask questions and give assignments
13	4	Definitions and examples of compact sets, as well as some theoretical results	Compactness	Attendance interactive lectures	Ask questions, give assignments, and make a 2nd attendance mid exam
14	4	Compact sets (further results)	Compactness	Attendance interactive lectures	Ask questions and give assignments
15	4	Stating and proving the intermediate value theorem	Intermediate value theorem	Attendance interactive lectures	Ask questions and give assignments

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ... etc.

30% monthly written exams

10% daily and oral exams, homework's, and class activities

60% written final exam

12. Learning and Teaching Resources

Required textbooks (curricular books any)	1. Introduction to General Topology, by: K. Joshi 2. Theory and problems of general topology, by Seymour Lipchitz, Schuam's series, 1965
Main references (sources)	1- Lecture Notes on Topology, by: John Rognes, 2018. 2- General Topology, by: Tom Leinster, 2014
Recommended books and references (scientific journals, reports...)	1- Lecture Notes- General Topology, by: Ziad Khalil, 2022. General Topology, by: Jesper M. Møller.
Electronic References, Websites	1- lecturer vv3JNSPKeEU