Al-Zaytoonah University of Jordan

Course Syllabus
According to JORDAN National Qualification Framework (JNQF)

Course Name: Topology

Course Number: 0101432

General Course Information:

Course Title	Topology
Course Number	0101432
Credit Hours	3 credit hours
Education Type	Traditional learning
Prerequisites/Co-requisites	Real Analysis (1)
Academic Program	Bachelor Program
Program Code	114
Faculty	Faculty of Science and IT
Department	Mathematics
Level of Course	4
Academic Year /Semester	2023/2024 1st Semester
Awarded Qualification	Bachelor
Other Department(s) Involved in Teaching the Course	-
Language of Instruction	English
Date of Production	2021-2022
Date of Revision	16-10-2023

Course Coordinator:

Coordinator's Name	
Office No.	
Office Phone Extension Number	
Office Hours	
E-mail	

Other Instructors:

Course Description *(English/Arabic)*:

English	This course covers the following topics: 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.
Arabic	يتناول هذا المساق المواضيع التالية : الفضاءات التبولوجية، المجموعات المفتوحة والمغلقة، النقاط الداخلية، النقاط الحدودية، النقاط المتراكمة، المجموعات المنغلقة ، توبولوجيا الفضاء الجزئي، القواعد والقواعد الجزئية،الاقترانات المتصلة، الاقترانات المتصلة، التشاكل.

Textbook: *Author(s), Title, Publisher, Edition, Year, Book website.*

Munkres, J. R. (2018). Topology (Second edition, reissue ed.). New York, NY: Pearson

References: *Author(s), Title, Publisher, Edition, Year, Book website.*

Long, P. E. (1971). An introduction to general topology. Columbus, Ohio: Merrill

Course Educational Objectives (CEOs):

CEO1	Understanding Topological Spaces: Students should develop a deep understanding of topological spaces, including the definition of open sets, neighborhoods, and the axiomatic properties of topological structures.
CEO2	Basis and Sub-basis: Students should learn about bases and subbases for topological spaces, their role in defining topologies, and their applications in characterizing open sets.
CEO3	Continuous Functions: Students should understand the concept of continuous functions between topological spaces and be able to prove the continuity of functions.

Intended Learning Outcomes (ILO's):

Intended learning outcomes (ILOs)		Relationship to CEOs	Contribution to PLOs	Bloom Taxonomy Levels*	JNQF Descriptors**
K	Knowledge and Understanding				
ILO1-k	Knowledge of how to communicate mathematics clearly.	CEO1	PLO1 -K	Understanding	K
ILO2-k	Knowledge of the main concepts in Topology.	CEO1+ CEO2+ CEO3	PLO1-K	Understanding	K
S					
ILO6-s	Making use of mathematical logic in practical life.	CEO1	PLO5-s	Applying	K, S
ILO7-s	Engaging scientific methodology as a way of thinking and as a tool in facing problems.	CEO1	PLO6-s	Applying	K, S
C	Subject specific skills				
IL11-s	Being able to work under ethical and professional standards within working teams.	CEO1+ CEO2+ CEO3	PLO11-c	Applying	S
	Engaging mathematics in various work sectors.	CEO1+ CEO2+ CEO3	PLO12-c	Applying	S
	Gaining scientific methodology for pursuing graduate studies.	CEO1+ CEO2+ CEO3	PLO12-c	Applying	S
D	Transferable skills:				
ILO6-d					

*Bloom Taxonomy Levels:

Level #	1	2	3	4	5	6
Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

** Descriptor (National Qualification Framework Descriptors): K: Knowledge, S: Skill, C: Competency.

Program Learning Outcome (PLOs):

	(PLOs)	JNQF Descriptors**		
		K	S	C
1.	Knowledge of the main concepts in pure mathematics.	√		
2.	Knowledge of the main concepts in applied mathematics.	√		
3.	Explain concepts, principles and theories in the fields of probability and statistics.	√		
4.	Possession of technological culture related to the fields of mathematics and its applications.	√		
5.	Making use of mathematical logic in practical life.		√	
6.	Engaging scientific methodology as a way of thinking and as a tool in facing problems.		√	
7.	Applying mathematical software packages in problem solving.		√	
8.	Being capable of data analysis.		√	
9.	Capability of teaching according to modern educational techniques.		√	
10.	Develop creative and innovative methods of teaching mathematics.		√	
11.	Showing the ability to work under ethical and professional standards within teams.			√
12.	Gaining critical thinking and scientific research skills.			√

** Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)

Weekly Schedule *(please choose the type of teaching)*
    √ **Face to Face (F2F)**
    ☐ **Hybrid** *(One – To - One)*
    ☐ **Online**

Schedule of Simultaneous and their Topics:

Week	First Lecture (F2F)	Second Lecture (F2F)	ILOs	PLOs	JNQF Descriptors*
1	Introduction	Topology and topological spaces	ILO1-k ILO2-k	PLO1-k	K
2	Examples of topological spaces, the left ray topology, the co-finite topology and, discrete and indiscrete topologies	Examples of topological spaces, the left ray topology, the co-finite topology and, discrete and indiscrete topologies	ILO2-k	PLO1-k	K
3	The usual topological space and lower limit topology.	The definition of open sets and closed sets with their properties and redefine the topological space by means of open sets and closed sets	ILO2-k	PLO1-k	K

			ILO2-k	PLO1-k	K
4	The definition of open sets and closed sets with their properties and redefine the topological space by means of open sets and closed sets	The definition of interior points and closure of subset. And prove some important properties.	ILO2-k	PLO1-k	K
5	The definition of the exterior of a subset A. And prove some important properties	The definition of interior points and closure of subset. And prove some important properties	ILO2-k	PLO1-k	K
6	. Solving exercises	The definition of a dense and prove some important properties.	ILO2-k	PLO1-k	K
7	The definition of a dense and prove some important properties	Solving exercises	ILO2-k	PLO1-k	K
	Midterm Exam (30%)				
9	Bases and subbases, definitions.	Bases and subbases, examples proving theorems involving these notions.	ILO2-k	PLO1-k	K
10	Bases and subbases, examples proving theorems involving these notions.	Solving exercises	ILO2-k	PLO1-k	K
11	The subspace of a topology	The subspace of a topology	ILO2-k	PLO1-k	K
12	The product topology	The product topology	ILO2-k	PLO1-k	K
13	Relative topological space	Relative topological space	ILO2-k	PLO1-k	K
14	Solving exercises	Solving exercises	ILO2-k	PLO1-k	K
15	**Projects Discussion**				
16	**Final Exam**				

* **K: Knowledge, S: Skills, C: Competency**

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:
- Lecture.
- learning through projects.
- learning through problem solving.

Course Policies:

A- Attendance policies:

The maximum allowed absences is 15% of the lectures.

B- Absences from exams and handing in assignments on time:

Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

Not handing assignment on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Discussion Forums, Quizzes) **20%**
- Midterm 30**%**
- Final Exam 50**%**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

Required Equipment:

- PC / Laptop with webcam and mic
- Internet Connection
- Access to the ZUJ E-Learning Platform at https://exams.zuj.edu.jo/
- E-learning plan
- Satisfaction questionnaires for online and face-to-face learning
- Software for e-learning
- Training

Assessment Tools Implemented in the Course:

- Final Exam
- Midterm Exam
- Quizzes
- Homework
- Discussion Forums
- Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching.

Responsible Persons and their Signatures:

Course Coordinator		Completed Date	/ /
		Signature	
Received by (Department Head)		Received Date	/ /
		Signature	