



## Course Specifications

<b>Course Title:</b>	Topology	
<b>Course Code:</b>	MTH 472	
<b>Program:</b>	B.Sc in Mathematics	
<b>Department:</b>	Mathematics Department	
<b>College:</b>	College of Science	
<b>Institution:</b>	Majmaah University	

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## A. Course Identification

<b>1. Credit hours:</b>
<b>2. Course type</b>
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> eighth Level/Four year
<b>4. Pre-requisites for this course (if any):</b> Real Analysis ( MTH 381 )
<b>5. Co-requisites for this course (if any):</b>

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	42	70 %
2	Blended	12	20 %
3	E-learning	6	10 %
4	Distance learning		
5	Other		

### 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	35
2	Laboratory/Studio	
3	Tutorial	15
4	Others (specify)	10
	<b>Total</b>	60

## B. Course Objectives and Learning Outcomes

<p><b>1. Course Description</b></p> <p>This course covers Topological spaces, Open sets and interior points, Limit points, Closed sets and closure sets, Neighborhoods, Relative topology, Product of topological spaces, Continuous functions, Open and closed functions, Homeomorphisms, Topological property, Separation axioms, Hausdroff and Lenz separation axioms, Compactness, Separation axioms, Dense sets, Connectedness, Metric spaces.</p>
<p><b>2. Course Main Objective</b></p> <p>Generally, Students are expected to</p> <p>1- To enable the students to understand the concept of topological spaces and some concepts in these spaces.</p>

2- The course aims at providing the student with the proper knowledge, cognitive skills.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge and Understanding</b>	
1.1	Deepen students' concepts	K1
1.2	Improve students understanding and awareness.	
1.3	Expand students' exposure to solve the problems	
1...		
<b>2</b>	<b>Skills :</b>	
2.1	Communicate mathematical ideas, both orally and in writing	S1
2.2		
2.3		
2...		
<b>3</b>	<b>Values:</b>	
3.1	Students can actively and critically participate in class activities Students can act responsibly and ethically in conducting their work Students can communicate, negotiate and evaluate their strengths and weaknesses as team members.	C4
3.2		
3.3		
3...		

### C. Course Content

No	List of Topics	Contact Hours
1	Topological spaces, Open sets and interior points, Limit points, Closed sets and closure sets	16
2	Neighborhoods, Relative topology, Product of topological spaces,	12
3	Continuous functions, Open and closed functions, Homeomorphisms, Topological property	14
4	Separation axioms, Hausdroff and Lenz separation axioms, Compactness, Separation axioms, Dense sets, Connectedness, Metric spaces	14
<b>Total</b>		

## D. Teaching and Assessment

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

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and Understanding</b>		
1.1	Identify topological spaces and some concepts in these spaces.  Knowledge of continuous, open and closed functions, homeomorphisms, topological property, separation axioms, Hausdroff and Lenz separation axioms, compactness, separation axioms, dense sets, connectedness, metric spaces	<b>Direct teaching:</b> Inquiry-based instruction PowerPoints and discussions  <b>Aimed teaching:</b> Discovery and oral questions	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Quizzes</li> <li>• Midterms</li> <li>• Final Exam</li> <li>• E-exam</li> <li>• Discussions</li> <li>• E-Exam</li> </ul>
1.2			
...			
<b>2.0</b>	<b>Skills</b>		
2.1	The students will be able to study some problems in topological spaces.	<b>Direct teaching:</b> Lectures Differentiation <b>Aimed teaching:</b> Discovery and oral questions <b>Indirect teaching:</b> Peer Learning	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Quizzes</li> <li>• Midterms</li> <li>• Final Exam</li> </ul>
2.2	The students will explain and interpret a general knowledge of topological spaces and some concepts in these spaces	<b>Direct teaching:</b> Lectures <b>Aimed teaching:</b> Discovery and oral questions <b>Indirect teaching:</b> Peer Learning	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Quiz</li> <li>• Midterms</li> <li>• Final Exams</li> </ul>
...			
<b>3.0</b>	<b>Values</b>		
3.1	The students should be able to formulate and solve mathematical problems such as: finding some concepts in topological spaces and finding properties in metric spaces	<b>Direct teaching:</b> Lectures <b>Aimed teaching:</b> Discovery and oral questions <b>Indirect teaching:</b> Cooperative Learning	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Quiz</li> <li>• Midterms</li> <li>• Final Exams</li> </ul>

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.2			
...			

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterms	7 <sup>th</sup> , 13 <sup>th</sup> weeks	30 %
2	Activities	Through of semester	10 %
3	Quizzes	Through of semester	10%
4	Electronic Test	13th week	10 %
5	Final exam	End of semester	40 %
6			
7			
8			

\*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- 4-office hours per week in the lecturer schedule.
  - Sunday 8-10 AM.
  - Wednesday 8-10.
  - The contact with students by e-mail and website.
- 3- activation of the virtual classrooms and academic guidance via Black Board LMS.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	<b>James Stewart: Multivariable Calculus. Seventh Edition, Brooks Cole, 2011.</b>
<b>Essential References Materials</b>	1. Mark de ongueville, Combinatory Course in Topology, 7 <sup>th</sup> Edition, 2011. James Munches, Topology, 2 <sup>nd</sup> Edition, 2000

<b>Electronic Materials</b>	1- List Electronic Materials, Web Sites, Facebook, Twitter, etc.
<b>Other Learning Materials</b>	List Essential References Materials (Journals, Reports, etc.)

## 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	- Classroom with capacity of 15-students.
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	NA
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	NA

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students/ internal committee	Direct (Students evaluation electronically organized by Deanship of registration and admission)/ Verification of students' papers
Extent of achievement of course learning outcomes	Staff members (Peer Reviewer)	Indirect (Frequent meetings consultation among the teaching staffs)
Quality of learning resources.	Staff members (course coordinators)	Direct (Meeting between course coordinators and the tutors)

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

<b>Council / Committee</b>	Mathematics Department
<b>Reference No.</b>	27
<b>Date</b>	8/8/1442 H -21/3/2021 G

Head of Department

Dr. Muqrin Almuqrin


