



Course Specifications

Course Title:	Set theory
Course Code:	2022106-3
Program:	Bachelor in Mathematics.
Department:	Department of Mathematics and Statistics
College:	Faculty of science
Institution:	Taif university

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A. Course Identification

1. Credit hours:3			
2. Course type			
a.	University <input type="checkbox"/>	College <input type="checkbox"/>	Department <input checked="" type="checkbox"/>
b.	Required <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>	Others <input type="checkbox"/>
3. Level/year at which this course is offered: 4 th level, 2 nd year			
4. Pre-requisites for this course (if any): Introduction to Mathematics (202112-3)			
5. Co-requisites for this course (if any): None			

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	4Hr /Week	100
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	40
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	Total	40

B. Course Objectives and Learning Outcomes

1. Course Description

The main objective of this course is studying: mathematical logic, elementary theorems and properties of set theory as: operations on sets, relations, functions, and binary operations defining on a nonempty set.

2. Course Main Objective

The student will be taught as follows:

- 1-Studying the elementary theorems and properties of set theory as: operations on sets, relations, functions, and binary operations defining on a nonempty set.
- 2- Introducing an introduction of a mathematical logic which a basic and useful tool in studying set theory.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding:	
1.1	Recognize fundamentals of mathematical logic and how to use it professionally in set theory.	K1
1.2	Identify the mathematical properties of the operations on sets such as intersection, union, and the difference of sets.	K1
2	Skills:	
2.1	Apply appropriate properties of the mathematical logic to prove some principles, theorems, formulas on sets, relation on sets and functions on sets.	S2
2.2	Use the type of given relations, functions, and operations on sets (binary or not).	S2
2.3	Explain some properties of relations, functions, and binary operations in solving various problems related to mathematical sciences or in postgraduate studies.	S2
3	Values:	
3.1	Demonstrate ethical behavior associated with institutional Guidelines in classroom, and in Lab.	V3

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to mathematical logic,	4
2,3	Sets and their properties, Operations on sets	8
4	Cartesian Product, Relations on the sets,	4
5	Equivalence relations.	2
6	Midterm exam, Equivalence classes and partition, Partial and total order relations,	7
7	Mappings, Injective Mappings and surjective mappings.	4
8	Bijjective mappings and the inverse of a bijjective mapping.	2
9	Composition of mappings.	5
10	Binary operations on sets, Algebraic structures.	4
Total		40

D. Teaching and Assessment

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

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding:		
1.1	Recognize fundamentals of mathematical logic and how to use it professionally in set theory.	<ul style="list-style-type: none"> Lectures Group discussions 	<ul style="list-style-type: none"> Quizzes Assignments
1.2	Identify the mathematical properties of the operations on sets such as intersection, union, and the difference of sets.	<ul style="list-style-type: none"> Lectures Group discussions 	<ul style="list-style-type: none"> Exams Assignments
2.0	Skills:		
2.1	Apply appropriate properties of the mathematical logic to prove some principles, theorems, formulas on sets, relation on sets and functions on sets.	<ul style="list-style-type: none"> Interactive classes Group discussions 	<ul style="list-style-type: none"> Quizzes Assignments
2.2	Use the type of given relations, functions, and operations on sets (binary or not).	<ul style="list-style-type: none"> Lectures Group discussions 	<ul style="list-style-type: none"> Exams Quizzes
2.3	Explain some properties of relations, functions, and binary operations in solving various problems related to mathematical sciences or in postgraduate studies.	<ul style="list-style-type: none"> Lectures Self-learning through the website 	<ul style="list-style-type: none"> Exams Quizzes Assignments
3.0	Values:		
3.1	Demonstrate ethical behavior associated with institutional Guidelines in classroom.	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Exams Quizzes

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes + Home works	Continues	10 %
2	Midterm exam	5 th -6 th	30 %
3	Class Work (Homework- report- class test....)	8 th	10 %
4	Final exam	11 th	50 %

*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:

6 hours per week (as defined in the teaching schedule of the faculty member) for academic advice and consultations.

Teaching staff is also available using Blackboard web site and Taif University “Edugate” System.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Susanna S. Epp, Discrete mathematics with applications, 4th Edition, Belmont, Calif Wadsworth Pub. Co. 1990.
Essential References Materials	Shwu-Yeng T. Lin and You-Feng Lin, Set Theory and Applications, 2nd Edition, Mariner Publishing Company, Inc., 1981.
Electronic Materials	https://www.youtube.com/watch?v=OzNfAQYstyE&list=PLp5QO1iuiUkNtvLwjssJYyQ3WbS9S8s2V
Other Learning Materials	Blackboard system

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom with an appropriate capacity, containing white board.
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show.
Other Resources (Specify, e.g., if specific laboratory equipment is required, list requirements or attach a list)	Wi-Fi internet connections

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	Indirect
Quality of learning resources	Peer Reviewer Students	Direct Indirect
Extent of achieving the course learning outcomes	Peer Reviewer Students	Direct Indirect

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

Council / Committee	Department of Mathematics and Statistics
Reference No.	11
Date	12-7-1443 H

قسم الرياضيات والإحصاء
Mathematics and Statistics
Department

