2023
TP-153

Course Specification
(Bachelor)

Course Title:	Set theory
Course Code:	2022106-3
Program:	Mathematics Program.
Department:	Department of Mathematics and Statistics
College:	Faculty of science
Institution:	Taif university
Version:	1
Last Revision Date:	20/05/2023 *Pick Revision Date.*

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (3rd level, 2nd year)					
4. Course general 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.					
5. Pre-requirements for this course (if any):					
Introduction to Mathematics (202112-3)					
6. Co -requirements for this course (if any):					
None					
7. Course Main Objective(s):					
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.**					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	**3Hr /Week**	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	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.	K1	• Lectures • Group discussions `	• Quizzes • Assignments
1.2	Identify the mathematical properties of the operations on sets such as intersection, union, and the difference of sets.	K1	• Lectures • Group discussions `	• 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.	S2	• Interactive classes • Group discussions	• Quizzes • Assignments
2.2	Use the type of given relations, functions, and operations on sets (binary or not).	S2	• Lectures • Group discussions `	• Exams • Quizzes
2.3	Explain some properties of relations, functions, and	S2	• Lectures • Self-learning through	• Exams • Quizzes

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	binary operations in solving various problems related to mathematical sciences or in postgraduate studies.		the website `	• Assignments
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate ethical behavior associated with institutional Guidelines in classroom, and in Lab	V3	• Lectures	• Exams • Quizzes

C. Course Content

No	List of Topics	Contact Hours
1.	**Introduction to mathematical logic,**	3
2.	**Sets and their properties,**	3
3.	**Operations on sets,**	3
4.	**Operations on sets,**	3
5.	**Cartesian Product,**	3
6.	**Relations on the sets,**	3
7.	**First Midterm exam**	3
8.	**Equivalence relations, equivalence classes and partition,**	3
9.	**Partial and total order relations,**	3
10.	**Mappings,**	3
11.	**Injective Mappings and surjective mappings,**	3
12.	**Bijective mappings and the inverse of a bijective mapping,**	3
13.	**Second Midterm exam**	3
14.	**Composition of mappings,**	3
15.	**Binary operations on sets, Algebraic structures.**	3
Total		**45**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	Continuous	10 %

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
		Evaluation	
2.	Assignments, report	Continuous Evaluation	10 %
3.	Midterm 1 Exam	8-9	15%
4.	Midterm 2 Exam	12-13	15%
5.	Final Exam	15-16	50%
...			

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

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

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture halls, containing white boards, and electronic monitors - The seats fit the number of students - Laboratories equipped with suitable numbers of computers
Technology equipment (Projector, smart board, software)	Data Show
Other equipment (Depending on the nature of the specialty)	Wi-Fi internet connections

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, Program Leader	Direct & Indirect
Effectiveness of Students assessment	Faculty, Program Leader	Direct
Quality of learning resources	Students, Faculty	Indirect
The extent to which CLOs have been achieved	Faculty	Direct & Indirect
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Department Council
REFERENCE NO.	4
DATE	October 2023

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