هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

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Course Title:	**Foundations of Mathematics.**
Course Code:	**111Math-3**
Program:	**B.Sc. of Mathematics**
Department:	**Mathematics**
College:	**Art and Science**
Institution:	**Najran University**
Version:	**1**
Last Revision Date:	**07-05-2023**

Table of Contents:

A. General information about the course:

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:	1/1				
4. Course general Description This course provides a comprehensive introduction to foundational mathematical concepts. It covers mathematical induction, principles of mathematical logic, sets, relations, mappings, and algebraic structures. By the end of the course, students will have a solid understanding of these concepts and be able to apply them in various mathematical contexts.					
5. Pre-requirements for this course (if any): None					
6. Co- requirements for this course (if any): None					
7. Course Main Objective(s) The main objective of this course is to provide students with a solid understanding of fundamental mathematical concepts and reasoning techniques, including mathematical induction, principles of mathematical logic, sets, relations, mappings, and algebraic structures.					

1. Teaching mode (mark all that apply)

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

2. 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	Define the basic concepts of logical mathematics.	K1	lectures discussions	Quizzes. Assignments Written exam
1.2	Describe the basic concepts and the fundamental properties of algebra and precalculus			
2.0	Skills			
2.1	Apply appropriate mathematical techniques for solving various problems in foundations of mathematics	S3	lectures discussions	Quizzes. Assignments Written exam
2.2	Solve problems on relationship types.	S1		
2..3	Solve problems on mathematical deduction and graphing.			
3.0	Values, autonomy, and responsibility			
3.1				

C. Course Content

No	List of Topics	Contact Hours
1.	**Element of Mathematical Logic:** Statements, Negative statement, Connectives, De Morgens laws properties of statement.	9
2.	**Sets:** Definition of the Set, types of numerical sets, the methods of defining a set, the membership and inclusion, the power set, complement of a set, Venn diagrams, properties of the sets.	9
3	**Methods of proof** Direct proof and indirect proof, proof with contradiction, contra positive, proof by counter examples, mathematical induction.	9
4	**Relations the** order pairs, the direct product of two sets, some properties of the direct product of two sets, cartesian product of sets, binary relations, binary relations on a set, Equivalence relations, partition of a set, equivalence classes the set of integers	9

	mod n, some properties.	
5	**Mappings**: Mappings, type of mappings, the inverse image, the equivalence of sets, Composition of mappings, properties of mappings.	6
6	**Binary Operations**: Binary operations, some Algebraic structures (Groups, Rings, Fields)	3
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	First Midterm exam	From 6 - 8 week	20%
2.	Second midterm exam	From 11- 13 week	20 %
3.	Assignments - Quizzes - Oral test	During classes	10%
4.	Final Exam	From 18- 20 week	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	• د. سلمان بن عبد الرحمن السلمان " المدخل الي البني الجبرية" دار الخريجي للنشر 1431هـ. • أ.د. فدوى سلامة ود. معروف عبدالرحمن سمحان "أسس الرياضيات" الطبعة الثالثة, مكتبة المتنبي سنة 1440هـ.
Supportive References	• Kenneth H. Rosen, Discrete Mathematics and Its Applications, Seven Edition McGraw-Hill Companies, Inc, 2012. • Seymour Lipschitz, "Theory and problems of discrete mathematics" Third edition All rights reserved. Manufactured in the United States of America.2007
Electronic Materials	• https://www.pdfdrive.com/discrete-mathematics-with-applications-e16611413.html
Other Learning Materials	.....

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture halls, containing white boards, and 25 seats approximately.
Technology equipment (projector, smart board, software)	• Laptop • Smart board • Projector.
Other equipment (depending on the nature of the specialty)	**None**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Student Questionnaire (Indirect)
Effectiveness of students assessment	Peer Reviewer	Rubrics (Indirect)
Quality of learning resources		
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	Council of Mathematics Department
REFERENCE NO.	14441017-0208-00014
DATE	17-10-1444H