هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

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Course Specification

Course Title:	**Real Analysis(2)**
Course Code:	**372Math-3**
Program:	**B.Sc. of Mathematics**
Department:	**Mathematics**
College:	**Arts and Sciences**
Institution:	**Najran University**
Version:	**2022**
Last Revision Date:	**10-09-2023**

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:	**6 / 3**				

4. Course general Description

This course will cover the foundations on Riemann integral- Darboux theorem sequences and Series of functions, properties. pointwise and uniform convergence of sequences and Series of functions –sigma algebra, measurable sets and measurable functions, Lebesgue integral ,and relation between Riemann integral and Lebesgue integral.

5. Pre-requirements for this course (if any):

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6. Co- requirements for this course (if any): None

7. Course Main Objective(s)

The main objective of the course is to study Riemann's integral, Sequences and Series of functions, Lebesgue measurable sets, Lebesgue measurable functions and Lebesgue integral.

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 Remain integral, sequence and series of function measurable sets and function, and Lebesgue integral	K1	• Lecture • discussions	• Quiz • Assignments • Midterm • Final Exam
1.2				
…				
2.0	Skills			
2.1	Solve problems in Remain integral, sequence and series of functions, measurable sets and functions, and Lebesgue integral	S1	• Lecture • discussions	• Quiz • Assignments • Midterm • Final Exam
2.2	Prove theorems of Riemann and Lebesgue integral.	S2		
2.3	Explain the relation between Remain and Lebesgue integrals.	S4		
3.0	Values, autonomy, and responsibility			
3.1	Work independently and continuous self-learning	V2	Assigning each group of students to collect and write topic in real analysis and explain it to their classmates	• Oral Exam • Rubrics
3.2				
...				

C. Course Content

No	List of Topics	Contact Hours
1.	The Riemann integral (Darboux theorem -Fundamental theorem of calculus	12
2.	Pointwise and uniformly convergent of sequences and series of functions.	12
3.	Borel sets and σ-algebra - Lebesgue outer measure , Lebesgue measurable sets and functions	9
4.	Lebesgue integral, Lebesgue's theorem on bounded functions - Relationship between Riemann and Lebesgue integrals	12
	Total	45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Semester Exam1	6 - 8	20
2.	Assignments	During classes	10
3.	Semester Exam2	11-13	20
4.	Final Exam	18-20	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	السانوسي، صالح عبدالله و القويز، محمد عبدالرحمن ،" مبادئ التحليل الحقيقي"الجزء الثاني ، مكتبة الملك فهد الوطنية، الطبعة الثانية 1998م
Supportive References	1. Fomin, S., Introductory Real Analysis, Mc Graw-Hill, 2. New York, (Revised English translated and edited by "Siverman, R. A."), 1986. 3. .Bridges, D. S., Foundations of Real and Abstract Analysis, Springer-Verlag New York, 1998. 4. Mali, S. C., Sativa Aurora, Mathematical Analysis, New Delhi, University of Delhi, 1992.

Electronic Materials	- http://en.wikipedia.org/wiki/Real_analysis - http:// goushusa.smcvt.edu/real analysis
Other Learning Materials	CD-ROM containing the scientific subjects in the course

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture Hall by the number of seats = 25 seat approximately.
Technology equipment (projector, smart board, software)	• Datashow • Smart Board • Wi Fi
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	
REFERENCE NO.	
DATE	