Course Specifications

Course Title:	Real Analysis 2
Course Code:	372 Math-3
Program:	Mathematics
Department:	Mathematics
College:	college of Science and Arts
Institution:	Najran University

Table of Contents

A. Course Identification

1. Credit hours: 3	

2. Course type

a. University ☐ College ☐ Department ☐ Others ☑

b. Required ☑ Elective ☐

3. Level/year at which this course is offered: ٦ / 4

4. Pre-requisites for this course (if any):

Real analysis(1) (371 Math-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	٣	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	٤٥
2	Laboratory/Studio	
3	Tutorial	
4	Others (Exams)	٣
	Total	٤٨
Other Learning Hours*		
1	Study	٣٠
2	Assignments	١٠
3	Library	١٠
4	Projects/Research Essays/Theses	
5	Others (Office hours)	١٥
	Total	١١٣

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Course Description

This course will cover the foundations of real analysis 2 The main focus of this

Riemann integral- Darboux theorem and Riemann sums, sequences and Series of functions and its properties., pointwice convergence and uniform convergence –sigma algebra, measurable sets and measurable functions ,relation between Riemann an Lebesgue integral.

2. Course Main Objective

1. Providing students with scientific facts and concepts about Riemann's integration and applications.
2. .Provide students with the appropriate amount of information that helps to understand the concepts of sequences and sequences of functions.
3. Provide students with adequate information on Lebesgue measurement.
4. Training students to find periods of convergence of sequences and sequences of functions.
5. Training students on how to find the integration of Lebesgue functions.
6. The tendency to search for subjects and related scientific book.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1	Define the basic concepts of the sequence, the sequences of functions , the power series, measurable and measurable function, Lebesgue measurable, Lebesgue integral and finally the relation between Lebesgue integral and Remain integral.	
1.2	Describe the basic concepts and the fundamental properties of Riemain integral and how to prove the function is integrable.	
1.3		
1...		
2	**Skills :**	
2.1	Configure the top and bottom total and find Riemann integration, and the integration of Lebesgue functions.	
2.2	Find convergence intervals and sequence functions.	
2.3	Demonstrate the relationship between Riemann integration and Lebesgue integration of functions	
2.4.	Conducting mathematical proofs of the theorems.	
3	**Competence:**	
3.1	Presents the concepts of real analysis are clearly.	
3.2	Show critical thinking mathematical to solve many problems in his specialty.	
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	**The Riemann integral (Darboux Theorem -Fundamental theorem of**	9

	calculus		
2	Sequences of functions Uniformly convergent of Sequences and series of functions-power series.		9
3	Properties of Series of functions - Uniformly convergent of Sequences and series of functions-power series.		6
4	Measure - Borel σ-algebra-outer measure- Lebesgue Measurable sets-Lebesgue measure- properties of Lebesgue measure.		9
5	Definition of Lebesgue integral-Measurable functions- Lebesgue's theorem on bounded convergence - Relationship of Riemann and Lebesgue integrals		12
...			
Total			45

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 .**		
1.1	Define the basic concepts of the sequence, the sequences of functions , the power series, measurable and measurable function, Lebesgue measurable, Lebesgue integral and finally the relation between Lebesgue integral and Remain integral.	•Lecture •Scientific discussions	- Quiz - Written Exam
1.2	Describe the basic concepts and the fundamental properties of Riemain integral and how to prove the function is integrable.	•Lecture •Scientific discussions	-Quiz -Written Exam
...			
2.0	**Skills:**		
2.1	Configure the top and bottom total and find Riemann integration, and the integration of Lebesgue functions.	•Lecture •Scientific discussions	- - Exercises - Assignments - Homework - Quiz - Written Exam
2.2	Find convergence intervals and sequence functions.	•Lecture •Scientific discussions	- Exercises - Assignments - Homework - Quiz - Written Exam
2.3	Demonstrate the relationship between Riemann integration and Lebesgue integration of functions.	•Lecture •Scientific discussions	- Exercises - Assignments - Homework - Quiz - Written Exam
2.4	Conducting mathematical proofs of the theorems.	•Lecture •Scientific discussions	- Exercises - Assignments

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
			- Homework - Quiz - Written Exam
3.0	Competence :		
3.1	Presents the concepts of real analysis are clearly.	- Lecture - Scientific discussions	- Oral Exam - Rubrics
3.2	Show critical thinking mathematical to solve many problems in his specialty	- Lecture - Scientific discussions	-Oral Exam - Quizzes, - Rubrics
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Exercises, Homework& Assignments	open	10%
2	Oral Exam and Rubrics	14th Week	5%
3	Quizzes	Open	5%
4	Written Test(1)	7th Week	15%
5	Written Test(2)	13th Week	15%
6	Final Exam	End of Semester	50%
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 :

- Introducing the course syllabus, grading scale and the distribution of marks for the course in the first lecture of the course.
- Arrangements for availability of teaching staff for individual student consultations and academic advice (include amount of time teaching staff are expected to be available each week).
- Office hours for a teaching staff for one hour weekly

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	1.Charles, C. P., Real Mathematical Analysis, Springer-Verlag New York, 2001. Kolmogorov, A
Essential References Materials	1.Fomin, S., Introductory Real Analysis, Mc Graw-Hill, New York, (Revised English translated and edited by "Siverman, R. A."), 1986.

	2..Bridges, D. S., Foundations of Real and Abstract Analysis, Springer-Verlag New York, 1998. 3. 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. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	• Lecture Hall by the number of seats = 25 seat approximately.
Technology Resources (AV, data show, Smart Board, software, etc.)	• Data show • Smart Board • Wi Fi
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	• None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Student course evaluation survey at the end of semester.	Students	Questionnaire (Indirect)
Effectiveness of teaching and assessment	Peer Reviewer	Rubrics (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	
Reference No.	
Date	