اعتماد
NCAAA

T4

2020

Course Specifications

Course Title:	REAL ANALYSIS
Course Code:	MATH 3460
Program:	Bachelor of Science in Mathematics
Department:	Mathematics
College:	College of Science and Humanities Alkharj
Institution:	PRINCE SATTAM BIN ABDUALZIZ UNIVERSITY

Table of Contents

A. Course Identification

1. Credit hours: 04	

2. Course type

a.	University	☐	College	☐	Department	☑	Others	☐
b.		Required	☑	Elective	☐			

3. Level/year at which this course is offered: Level 8

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

Math 3320, Math 3330

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**	04	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	48
2	**Laboratory/Studio**	0
3	**Tutorial**	0
4	**Others** (specify) – (5 Office Hours in a week)	60
	Total	108

B. Course Objectives and Learning Outcomes

1. Course Description

Sets and Fields – Real Numbers – Countability – Metric spaces – Closed sets – Compact spaces – Compact subsets of Euclidean space – Sequences and Series – Completeness –
Continuity – Continuity and Compactness – Differentiability – Mean Value Theorem – Taylor Series – Reimann Steieltjes Integral – Integrability – Fundamental Theorem of Calculus –
Sequences of Functions – Uniform Convergence – Equicontinuity – Power Series – Fundamental theorem of Algebra

2. Course Main Objective

1- The objective of the course is to enrich the knowledge of the students with regard to analysis of real valued univariate functions and metric spaces.
2- Course will be reviewed based on the report received from Course Coordinators and curriculum review committee

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Gain Knowledge about Sets and Fields, Metric Spaces, sequences and completeness	K1
1.2	Gain analytical concepts about differentiability and integrability	K2
2	**Skills :**	
2.1	Write simple analytical proof	S1
2.2	Evaluate Limits, Rolles Theorem, Partitions, RI Functions	S2

C. Course Content

No	List of Topics	Contact Hours
1	Review of Sets and Fields –Real Number Concepts	4
2	Metric Spaces and Types, Euclidean Space	4
3	Closed Sets and Compact Spaces	4
4	Sequence and Series, Completeness	4
5	Continuity	4
6	Continuity and Compactness	4
7	Differentiability	3
8	Mean Value Theorem	3
9	Taylor Series	3
10	Reimann Steielties Integral	3
11	Integrability	3
12	Fundamental Theorem of Calculus	3
13	Uniform Convergence – Equicontinuity	3
14	Power Series – Fundamental Theorem of Algbera	3
	Total	48

D. Teaching and Assessment

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

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
1.0	**Knowledge and Understanding**		
1.1	Gain Knowledge about Sets and Fields, Metric Spaces, sequences and completeness	1. Class Room Lectures	Direct Assessment involving:
1.2	Gain analytical concepts about differentiability and integrability	2. Interactive sessions 3. Exclusive Office Hours for clearing doubts in small groups	1. Two Internal Exams 2. At least two Quiz 3. End Semester Exam
2.0	**Skills**		
2.1	Write simple analytical proof	1. Tutorials 2. Group Discussion 3. Class room lectures	Direct Assessment involving: 1. Homework 2. Assignments 3. Quiz 4. Exams
2.2	Evaluate Limits, Rolles Theorem, Partitions, RI Functions		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid Term Exam I	6	20%
2	Quiz	4 & 10	5%
3	Mid Term Exam II	13	20%
4	Continuous Assessment – Homework, Assignment, Attendance etc.	--	5%
5	End Semester Exam	15	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 :

1. Exclusive Office Hours – 5 Hours per week
2. Academic Advising for Students – 1 Hour per week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	- Rudin W., "Principles of Mathematical Analysis", 3rd ed. McGraw- Hill Science/Engineering/Math, New York, NY: McGraw- Hill, ISBN: 007054235X - Elementary Real Analysis, Second Edition, Brian S. Thomson, Judith B. Bruckner, Andrew M. Bruckner. www.classicalrealanalysis.com (2008), xvi 684 pp. [ISBN 143484367X]
Essential References Materials	NIL
Electronic Materials	NIL
Other Learning Materials	Lecture Notes Prepared by the Department of Mathematics

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms with Smart boards with seating facilities for at least 30 students
Technology Resources (AV, data show, Smart Board, software, etc.)	Smartboard, Internet Connection for Blackboard Computer Lab with software packages such as Excel etc.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Nil

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course Evaluation	Quality Assurance Committee of the Department	Review all the course documents and course report
Peer Review	Senior Faculty Members / HoD	Attend the lecture and fill in a form
End Semester online survey	students	online survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes,Quality oflearning resources, etc.)
Evaluators (Students,Faculty, Program Leaders,Peer Reviewer, Others (specify)
Assessment Methods(Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	