



Course Specifications

Course Title:	Infinite Series and Calculus Applications
Course Code:	MATH 2311
Program:	Bachelor of Science in Mathematics
Department:	Mathematics
College:	College of Science and Humanities Alkharj
Institution:	PRINCE SATTAM BIN ABDUALZIZ UNIVERSITY

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A. Course Identification

1. Credit hours:	04(4,0,0)
2. Course type	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered:	Level 4
4. Pre-requisites for this course (if any):	MAT 1060
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

<p>1. Course Description</p> <p>Sequences and Series – sequence of real number- Bounded and monotonic sequences- Geometric sequences-infinite series- Convergence and Divergence of Infinite Series - Integral Test - Ratio Test- Root Test and Comparison Test. Conditional Convergence and Absolute Convergence - Alternating Series Test- Power Series – Differentiation and integration of power series - Taylor and Maclaurin series- The centroid of a plane region- Moments and center of mass – Work- Power –Energy-Fluid pressure and force- Newton's Method- Linearization and Differentials- Optimization</p>
<p>2. Course Main Objective</p> <p>1- The course aims to provide a broad knowledge about various types of sequences and series and various types of tests to check the convergence or divergence of a given infinite series and enhance the ability of the students to solve problems of physical science using the techniques of differentiation and integration. Course will be reviewed based on the report received from Course Coordinators and curriculum review committee</p>

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Understand various types of Infinite Series	K1
1.2	Recall different types of techniques of integration	K4
2	Skills :	
2.1	Use different types of tests to check for the convergence and divergence of infinite series	S2
2.2	Solve mathematical problems independently	S1

C. Course Content

No	List of Topics	Contact Hours
1	Review of Basic concepts about sequences and series	5
2	Types of Sequences and series	5
3	Tests for Convergence and Divergence of Infinite Series	6
4	Conditional Convergence, Absolute Convergence, Alternating Series	4
5	Power Series	4
6	Taylor and Mclaurin Series	6
7	Centroid, Moments, Center of Mass	6
8	Work, Power, Energy	6
9	Linearisation, Differentials and optimization	6
Total		48

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 and Understanding		
1.1	Understand various types of Infinite Series	1. Class Room Lectures 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
1.2	Recall different types of techniques of integration and convergence of series		
2.0	Skills		
2.1	Use different types of tests to check for the convergence and divergence of infinite series	1. Application oriented exercises 2. Homework to improve the analytical skills	1. Homework 2. Assignments 3. Quiz 4. Exams
2.2	Solve mathematical problems independently		

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	- Howard Anton, "Calculus with analytical geometry", John Wiley & Sons, Last Edition. - Calculus by Ron Larson (Jan 11, 2005) - Calculus by Bruce H. Edwards and Ron Larson (Jan 16, 2009).
Essential References Materials	NIL
Electronic Materials	Paul's online series
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 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	