اعتماد
NCAAA

T4
2020

Course Specifications

Course Title:	Integral Calculus
Course Code:	MATH1060
Program:	B.Sc.
Department:	Mathematics
College:	Science and Humanities
Institution:	Prince Sattam Bin Abdulaziz University

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2030
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Table of Contents

A. Course Identification

1. Credit hours: 4	

2. Course type

a. University ☐ College ☑ Department ☐ Others ☐

b. Required ☑ Elective ☐

3. Level/year at which this course is offered: 1ˢᵗ year, 2ⁿᵈ semester

4. Pre-requisites for this course (if any)**:** Math1050

5. Co-requisites for this course (if any)**:** NA

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	Weekly 4 hours	100
2	Blended		
3	E-learning		
4	Correspondence		
5	Other	office hours 5	

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture (12 x 2)	24
2	Laboratory/Studio	
3	Tutorial (12X2)	24
4	Others (specify) 5 office hours a week	60
	Total	108

B. Course Objectives and Learning Outcomes

1. Course Description

This course is directed primarily towards students pursuing a B.Sc. degree in Engineering. Though the contents predominates concepts like Integration: Integration, Reduction Formulas, Arc length, Numerical Integration, Parametric Equations and many others. This course explains these laws of mathematics in the context of engineering sciences in order to make student understand their application in their field of specialization.

2. Course Main Objective

    The main objective of this course is to provide students with a strong foundation in mathematical concepts and equip them to take up various courses in Mathematics at various levels of study in their future colleges.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Familiarize with various techniques of Integration such as integration by substitution, Integration by parts, Integration by splitting a function into partial fractions, reduction formula and be able to define the scientific background of Integration.	K1
2	**Skills**	
2.1	Solve problems applying techniques of integration and evaluate area, volume and length of arc in Cartesian as well as polar coordinate system	S1
2.3	Compute Area of Surfaces and Volume of Solids using Integration	S2
3	**Values**	
3.2	Understand the relationship between differentiation and Integration	V1

C. Course Content

No	List of Topics	Contact Hours
1	Indefinite Integrals and Techniques of Integration	8
2	Trigonometric Integrals	4
3	Integration by Partial Fractions, Integration by parts, Completing Square	8
4	Reduction Formula, Definite Integrals	8
5	Applications : Areas, Arc Length	8
6	Volumes of Revolution, Numerical Integration	4
7	Parametric Equations, Polar Coordinates, Areas in Polar Coordinates	4
8	Indeterminate forms and Improper Integrals	4
	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	Familiar with various techniques of Integration such as integration by substitution, Integration by parts, Integration by splitting a function into partial fractions, reduction formula and be able to define the scientific background of Integration.	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.
2.0	**Skills**		
2.1	Solve problems applying techniques of integration and evaluate area,	1. Application oriented exercises	1.Homework 2.Assignments

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	volume and length of arc in Cartesian as well as polar coordinate system	during tutorial session.	3.Quiz 4. Mid Term and Final Exam
2.2	Compute Area of Surfaces and Volume of Solids using Integration	2.Homework to improve the analytical skills	
3.0	**Values**		
3.1	Understand the relationship between differentiation and Integration	Exercises during Lecture and Tutorials and interactive sessions	1. Internal Exams End Semester Exam

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid Term Exam I	6	20%
2	Quiz	3,9	5%
3	Mid Term Exam II	12	20%
4	Continuous Assessment – Homework, Assignment, Attendance etc.	--	5%
5	End Semester Exam (50%)	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.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	• Integral Calculus 1060 for PYP • Lecture Notes Prepared by the Department of Mathematics and displayed in Website / Blackboard of Faculty Member
Essential References Materials	• -Howard Anton, "CALCULUS EARLY TRANSCENDENTALS", John Wiley & Sons, Last Edition. • -Calculus by Gilbert Strang – MIT, Wellesley-Cambridge press, Box 82-279, WellesleyMA02181 • -Tom M. Apostol, CALCULUS VOLUME 1, One-Variable Calculus, with an Introduction to Linear Algebra, SECOND EDITION, John Wiley & Sons, Inc. New York, Santa Barbara, London, Sydney, Toronto, Second Edition Copyright 01967 by John WiJey & Sons, Inc. • Stewart - Calculus - Early Transcendentals 6e.
Electronic Materials	Blackboard @psau.edu.sa
Other Learning Materials	• YouTube Chanel : Hesham_Math playlist Mat1060

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms with seating facilities for at least 30 students
Technology Resources (AV, data show, Smart Board, software, etc.)	• Providing class rooms with data show and smart boards • Teaching Resource Room
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	N A

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching and assessment.	Students	Survey
Extent of achievement of course learning outcomes.	Developmental quality unit	Learning outcomes assessment.
Quality of learning resources Verifying standards of student achievement.	Developmental quality unit	Learning outcomes assessment.
Effectiveness of teaching.	Students	Survey
Extent of achievement of course learning outcomes.	Independent member teaching staff	Check marking by an independent member teaching staff of samples of student work.
Evaluation of the course file	Program quality and accreditation unit	Check and review the course file content.

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	