Course Specification
(Bachelor)

Course Title:	Introduction to Integral
Course Code:	282 Math-3
Program:	B.Sc. of Computer Science + Information Systems
Department:	Computer Science and Information Systems
College:	Computer Science and Information Systems
Institution:	Najran University
Version:	2
Last Revision Date:	17-05-2025

Table of Contents

A. General information about the course:

1. 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: (3/2)					
4. Course General Description:					
This course offers the topics including Riemann Sums, definite and indefinite integrals, fundamental theorem of calculus, Integration techniques, improper integrals, and applications of the definite integrals.					
5. Pre-requirements for this course (if any)**:**					
Differential Calculus (150MATH-4)					
6. Co-requisites for this course (if any)**:**					
7. Course Main Objective(s):					
The main objective of this course is to introduce the fundamental concepts of definite and indefinite integrals, provide an overview of integration techniques, and explore key applications of definite integrals.					

2. 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		

3. 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 PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Define **indefinite** and **definite integrals** precisely using standard mathematical terminology.		Lecture Cooperative learning Problem solving Brainstorming	Assignments Quiz Midterm Exam Final Exam
1.2	Explain the concept of an **antiderivative** and its relation to the **integral of basic functions**.			
1.3	Identify **standard techniques of integration**, including substitution, integration by parts, trigonometric and hyperbolic substitutions, partial fractions, and special substitutions.			
2.0	**Skills**			
2.1	Calculate the definite integrals using Riemann' sum		Lecture Cooperative learning Problem solving Brainstorming	Assignments Quiz Midterm Exam Final Exam
2.2	Evaluate indefinite and definite integrals by different methods of integration.			
2.3	Applying the definite integrals for evaluating the area of plane regions, arc length, and volumes.			
3.0	**Values, autonomy, and responsibility**			
3.1				

C. Course Content

No	List of Topics	Contact Hours
1.	Riemann Sums The Definite Integrals Properties of the Definite Integrals Antiderivatives and the Indefinite Integrals Integration of Basic Functions Mean Value Theorem and the Fundamental Theorem of Calculus.	**8**
2.	Indefinite Integrals and the Substitution Rule Integrals Involving the Trigonometric and Hyperbolic Functions Integral involving the Inverse of Trigonometric and Hyperbolic functions	12
3.	Integration Techniques: Integration by Parts Trigonometric and Hyperbolic Substitutions Integration of Rational Functions by Partial Fractions	8
4.	Integrals involving Quadratic Functions Special Substitutions Integrals involving Power of Trigonometric Functions	6
5.	Improper Integrals	3
6.	Application of the definite integrals: Areas, Volumes, and Arc length	8
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exams	6-8 11-13	20 20
2.	Assignments & Quizzes	During classes	10
3.	Final Exam	16-18	50
4.	Final Exam	16-18	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	- George Thomas, Joel Hass, Maurice D. Weir, Thomas' Calculus, 2014, 13th edition, Pearson Education.
Supportive References	- Howard Anton, Calculus, 2009, 9th edition, JOHN WILEY & SONS, INC. - Salas, Calculus: One and Several Variables, 2007, 10th edition, JOHN WILEY & SONS, INC.
Electronic Materials	https://www.youtube.com/watch?v=CkpHcB5HYSE&list=PLpSIRgI7BcxPQ4UppBd2-PsgbwSKv6-rj
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 30 seats.
Technology equipment (projector, smart board, software)	- Blackboard Platform - Mathematica Program Projector
Other equipment (depending on the nature of the specialty)	**N/A**

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		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	