هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

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Course Specification

Course Title:	**Integral calculus**
Course Code:	**112Math-3**
Program:	**B.Sc. of Mathematics**
Department:	**Mathematics**
College:	**Arts and** Science
Institution:	**Najran University**
Version:	**1**
Last Revision Date:	**07-05-2023**

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A. General information about the course:

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:	2/1				
4. Course general Description					
This course is a 3-credit course. It serves as a continuation of calculus I course. 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 (101-MATH-4)					
6. Co- requirements for this course (if any): None					
7. Course Main Objective(s)					
To introduce the concepts of definite and indefinite integrals, Integration techniques, and some applications of definite integrals					

1. 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		

2. 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 CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Write the definition of indefinite and definite integrals.	K1	**Lecture discussions**	**Assignments Quiz Midterm Exam Final Exam**
1.2	Define the anit-derivative and the integral of the basic functions.			
1.3	Recognize the different techniques of integration (Substitution rule, integration by parts, trigonometric and hyperbolic substitutions, partial fractions, special substitutions).			
2.0	Skills			
2.1	Calculate the definite integrals using Riemann' sum	S1	Lectures discussions	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	Work within groups and independently.	V1	homework	Oral Test Notes Card

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 Exam	6-8 11-13	20 20
2.	Assignments & Quizzes	During classes	20
3.	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	صالح السنوسي ، معروف عبد الرحمن ، كمال الهادي عبد الرحمن ، يوسف الخميس : مبادئ التفاضل والتكامل (الجزء الأول) ، مكتبة الملك فهد الوطنية أثناء النشر ردمك 5 – 30 – 38 – 9960 لعام 1421 هـ
Supportive References	رمضان جهيمة و احمد عبدالعالي هب الريح، التفاضل والتكامل الجزء الاول ، 2002، الطبعة الثالثة، دار الكتاب الجديد المتحدة - George Thomas, Joel Hass, Maurice D. Weir, Thomas' Calculus, 2014, 13th edition, Pearson Education. - 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	1- https://www.youtube.com/watch?v=w-V1OGXIabw&list=PLpSIRgI7BcxNqp_Jr0OgCyPI6iAXb6u98 ww.youtube.com/watch?v=GDoX5CQD7yA&list=PLvIfwkewI3_1fJ45Kmp4heyY5WjLUzrGp
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		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	Council of Mathematics Department
REFERENCE NO.	14441017-0208-00014
DATE	17-10-1444H