Course Specification

(Bachelor)

Course Title:	Calculus 2
Course Code:	MATH202
Program:	Bachelor of Mathematics
Department:	Mathematics
College:	College of Science
Institution:	Northern Border University
Version:	4
Last Revision Date:	20/05/2024

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (4)					
2. Course type					
A.	☐University	☒ College	☐Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (.....)					
4. Course general Description:					
This course is considered as a first course in differential calculus, dealing mainly with differentiations of elementary functions and their applications.					
5. Pre-requirements for this course (if any)**:**					
Calculus 1					
6. Co-requisites for this course (if any)**:**					
Not applicable					
7. Course Main Objective(s):					
1. Apply the concepts of inverse function in deriving equivalent formulas for certain inverse functions. **2. Apply L' Hôpital's rule in finding the limit of indeterminate forms.** **3. Understand the concept of the fundamental theorem of calculus.** **4. Integrate functions by applying the techniques of integrations.** **5. Apply the concepts of definite integral to compute area between two curves, volumes, length of a plane curve, area of a surface of revolution.**					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	5	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**	30
5.	**Others (specify)**	
Total		75

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Demonstrate the basic and fundamental concepts of calculus	K1	• Collaborative learning • Self-learning • Casting • Class\Group discussion,	• Written exams • Discussion • Homework .
1.2				.
...				
2.0	**Skills**			

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Apply different methods to solve problems.	S3	• Lab-based learning • Collaborative learning Self-learning	• **Reports** • **Projects** • **Laboratory exams** **Presentation**
2.2				
...				
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Exponential functions, Logarithmic functions, Inverse functions, Inverse of trigonometric and derivative, Inverse of hyperbolic functions and derivatives.	12
2.	Hospital's rule, other Indeterminate forms.	6
3.	The indefinite integral.	6
4.	Integration by substitutions, Integration by parts.	8
5.	Integration by trigonometric substitutions, Integration by partial fractions, The definite integrals.	12
6.	The fundamental theorem of calculus.	7
7.	Evaluating definite integrals by substitution.	7
8.	Application of definite integral (Area between two curves and volumes).	9
9.	Application of definite integral (length of a plane curve and area of a surface of revolution).	8
Total		**75**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework 1	2	5
2.	Quiz 1 (written test)	4	5
3.	Homework 2	5	5
4.	Midterm (written test)	8-9	30
5.	Homework 3	10	5
6.	Quiz 2 (written test)	11	5
7.	Homework 4	14	5
8.	Final Exam (written test)	16-17	40
	Total		100

*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	Calculus: Early Transcendental; J. Stewart, International Metric Version, 2020.
Supportive References	Anton, H., Bivens, I., & Davis, S. (2021). Calculus: Early Transcendental (12th ed.). John Willy & Sons.). John Willy & Sons.
Electronic Materials	Digital Library of the Northern Border University https://nbu.edu.sa/EN/E-library/Pages/default.aspx
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms , 20 seats
Technology equipment (projector, smart board, software)	Smart Board& Data show
Other equipment (depending on the nature of the specialty)	Printer, Photocopier, Papers A4, Desktop Computer, phone extension, whiteboard markers of different colors, a wiper for whiteboard.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Indirect
	Faculty	Direct / Indirect
	Program Leaders	Indirect
Effectiveness of students assessment	Student	Indirect
	Faculty	Direct
	Peer Reviewer	Direct
	Program Leaders	Direct / Indirect
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Student	Indirect
	Faculty	Direct

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Mathematics Department council
REFERENCE NO.	9th meeting of the academic year 1444-1445 H
DATE	12/11/1445 corresponding to 20/05/2024