



Course Specification

— (Bachelor)

Course Title: : Calculus

Course Code: 150 Math-4

Program: : Preparatory Year

Department: : Basic sciences

College: : Deanship of preparatory

Institution: : Najran University

Version: **2023**

Last Revision Date: 28-8-2023





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A. General information about the course:

1. Course Identification

1. Credit hours: (4H)

2. Course type

A. University College Department Track Others **PY**

B. Required Elective

3. Level/year at which this course is offered: **PREPARATORY YEAR**

4. Course general Description:

This course is designed to cover the Differential Calculus. It includes limits, continuity, derivatives, and the applications of derivatives. The types of functions studied include algebraic, trigonometric, exponential and logarithmic.

5. Pre-requirements for this course (if any):

NON

6. Pre-requirements for this course (if any):

NON

7. Course Main Objective(s):

- Students are expected to have strong and sound understanding of the differentiation calculus in term of its concepts, techniques and theorems.
- Students are expected to apply them on studying the behavior of functions.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	100%
2	E-learning	-	
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 		
4	Distance learning		



3. Contact Hours (based on the academic semester)





No	Activity	Contact Hours
1.	Lectures	60
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	15
5.	Others (specify)	
Total		75

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	Define: limit, continuity, derivative, extrema, increasing, decreasing, concavity, limits laws, differentiations rules of functions, and the equation of tangent line. Determine limits and continuity at a point from the graph of a function. Using the graph of the first derivative of a function to find the critical numbers, the x coordinate of the local extreme values, the intervals on which f is: increasing, decreasing, concave upward, concave downward, and the x-coordinate of the inflection point. Using the graph of the second derivative of a function to find the intervals on which f is concave upward, concave downward and the x coordinate of the inflection point.		<ul style="list-style-type: none"> - Lecture - Cooperative learning - Problems solving - Brain storming - Self-Learning 	- Final Exam
...				
2.0	Skills			
2.1	Evaluation of limits, and the discussion of the continuity of a functions.		<ul style="list-style-type: none"> - Lecture - Cooperative learning - Problems solving 	- Final Exam





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.2	To find the derivative of functions (in 1 st degree, or high degree).		- Brain storming - Self-Learning	
2.3	Applying the derivative of a function for studying: extrema, increasing, decreasing, concavity of functions, and the equation of tangent line.			
3.0	Values, autonomy, and responsibility			
3.1	Study, learn, and work independently Work effectively in team, and respect different points of view. Work effectively in team,		- Lecture - scientific discussions -solving exercise through individual work.	- Oral exam -Questionnaire

C. Course Content

No	List of Topics	Contact Hours
1.	Limits and Continuity	
2.	Definition of Limits	3
3.	Limits Laws	4
4.	Limits Involving Infinity	3
5.	Continuity of Functions	4
6.	The Derivative	
7.	The Limit definition of derivative & the Tangent Line Problem	4
8.	Differentiation Rules	5
9.	Derivative of Trigonometric Functions	4
10.	The Chain Rule	4
11.	Implicit Differentiation	4
12.	Derivative of Logarithmic and Exponential Functions	4
13.	Higher order derivatives	3
14.	Implicit Differentiation with Logarithmic and Exponential Functions	3
15.	Extreme of Functions	5
16.	Increasing and decreasing function	5
17.	Concavity	5
Total		60



D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assessment		20
2.	midterm exam		30
3.	Final Exam		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	Differentiation Calculus, Ibraheem Alolyan, et al , The King Saud University, 4 th Edition Year: 2019.
Supportive References	<ul style="list-style-type: none"> Anton, H; Bivens, I & Davis, S. Calculus Early Transcendentals, Ninth Edition, Wiley & Sons, 2009. Thomas, Calculus, Pearson Education , Addison Wesley, 2004.
Electronic Materials	<ul style="list-style-type: none"> https://www.ck12.org/book/CK-12-Calculus-Concepts/section/1.7/ https://zr9558.files.wordpress.com/2013/10/thomas_-calculus.pdf
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	E-classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	Blackboard System Documents Video Camera Free software as (Geogebra, Wolfram Computation Int.) https://www.wolframalpha.com/ https://www.geogebra.org/graphing
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	No need





F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Council / Committee	Indirect
Effectiveness of Students assessment	Student Evaluation	Direct
Quality of learning resources	Council / Committee	Direct
The extent to which CLOs have been achieved	Council / Committee	Direct
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Council of the Department
REFERENCE NO.	14450302-0532-00001
DATE	02\03\1445 - 17\9\2023

