National University
Of Computer & Emerging Sciences

Course Instructor	Miss Alishba Tariq, Ms. Fareeha Sultan, Mr. Mairaj Ahmed, Mr. Nadeem Khan and Miss Urooj,	**Semester**	FALL
Batch/Section(s)	Batch 2023 (BSCS, BSSE, BSAI, BSCY)	**Year**	2023

Department	Department of Computer Science	**Dept. Code**	CS
Course Title	Calculus and Analytical Geometry	**Course Code**	MT 1003
Pre-requisite(s)	None	**Credit Hrs.**	3

PLO	Program Learning Outcome (PLO) Statement	Level	Tools
01	An ability to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems	E	Q, A, M, F

I = Introduction, R = Reinforcement, E = Evaluation.
A = Assignment, Q = Quiz, M = Midterm, F=Final, L = Lab, P = Project, W = Written Report.

No.	Course Learning Outcome (CLO) Statements	Tools
01	• Solve algebraic equations and inequalities by using properties of absolute values.	Q1, M1
02	• Analyze and identify the function and sketching the curve by using tools of calculus.	Q1, A1, M1
03	• Express the ideas of rate of change, derivatives and anti-derivatives using the concept of limits and continuity.	A1, M1, F
04	• Apply derivatives and integrals for solving different problems arising in daily life.	Q2, A2, M2, F
05	• Identify and determine the behavior of sequence and series.	Q3, A3, F

Text Book(s)	**Title**	Calculus Early Transcendental 11th Edition
	Author	Howard Anton, IRL Bivens, Stephen Davis
	Publisher	JOHN WILEY
Ref. Book(s)	**Title**	Thomas Calculus 14 Edition
	Author	George. B. Thomas
	Publisher	Pearson

Tentative Weekly Lectures Schedule BOOK: Calculus Early Transcendental 11th Edition

Week	Contents/Topics	Exercises/Questions	CLO
1	Interval, Inequality, Relation and Functions, One-One and onto function.	Appendix E (Q23-44) Appendix F (Q17-36)	**01**
2	Vertical line test, Piecewise function, Absolute value function, Domain and Range of functions, Symmetry, Even/odd function, Asymptote	**0.1** (1-04, 7-10, 27,28) **0.2**(5-18, 27-34,5363,66,67) **0.4**(9 to 16)	**02**
3	Concepts of limit. Evaluation of limits. Continuity and points of discontinuity. Types of discontinuity. **[Assign Assignment 1, Topics: Limit, Continuity and differentiation]**	**1.1** (1-16) **1.2** (1,3-32) **1.5** (1-6,11-22, 29,30,35,36)	**03**
4	Rules and techniques of differentiation. Product and quotient rule. Derivative of trigonometric and logarithm function **[Conduct Quiz 1, Topics: Appendix E, F and Chap # 0]**	**2.3** (1-24, 41-47) **2.4** (1-24) **2.5** (1-24)	**03**
5	Chain rule Implicit differentiation. Indeterminate forms, L' Hospital Rule **[Collect Assignment 1]**	**2.6** (7-40) **2.7** (3-18,27-30) **6.5** (7-43)	**03** **04**
6	**SESSIONAL EXAM 1** (September 25 - September 28, 2023)		
7	Application of derivatives, Role's and Mean Value's Theorem **[Assign Assignment 2, Topics: Applications of derivatives]**	**3.4** (10-20), **4.8** (1-8)	**04**
8	Concavity, Increasing and Decreasing. Relative Extreme (1st and 2nd derivative test) Absolute Maxima and Minima **[Conduct Quiz 2, Topic: L' Hopital's Rule]**	**4.1** (15-30) **4.2** (7-12, 25-36)	**04**
9	Riemann sums **[Collect Assignment 2]**	**5.4** (35-48)	**04**
10	Techniques of integration, Basic Integration, Integration by parts Reduction formula, Trigonometric substitution	**7.1** (1-30), **7.2** (1-30, 61,62,63) **7.4** (1-25,37-48)	**03**
11	**SESSIONAL EXAM 2** (October 30 – November 2, 2023)		
12	Area bounded by the curves. Volume by Disk and washer method	**6.1** (1-18), **6.2** (1-26)	**04**
13	Integration of Rational function by Partial fraction, u= tan(x/2) substitution, Improper integrals. **[Assign Assignment 3, Topic: Integration]**	**7.5** (9-30), **7.6** (65-70) **7.8** (3-32)	**03**
14	Infinite Sequences and Series, Introduction to Sequences Infinite series, The integral test	**9.1** (7 to 19) **9.4** (9 to 22)	**05**
15	Comparison tests, Absolute convergence, The ratio and root test **[Conduct Quiz 3, Topics: Sequences and Series]**	**9.5** (5 to 20)	**05**
16	Revision **[Collect Assignment 3]**		
	Final Exam (December 18, 2023 – January 6, 2024)		

Marks Distribution:

Particulars	% Marks
1. Assignments	**10**
2.Quizzes	**10**
3.SESSIONAL EXAM 1	**15**
4.SESSIONAL EXAM 2	**15**
5. Final Exam	**50**
Total:-	**100**

Important Instructions to be followed for this Course

- Be in classroom on time. Any student who arrives more than 5 minutes late in the class would be marked LATE. Anybody coming to class more than 15 minutes late will be marked ABSENT.
- Turn off your cell phones or any other electronic devices before entering the class.
- Maintain the decorum of the class room all the time.
- Avoid a conversation with your classmates while lecture is in progress.
- Submit your assignments on time, no assignment will be accepted after the deadline.

Instructions / Suggestions for satisfactory progress in this course:

- On average, most students find at least three hours outside of class for each class hour necessary for satisfactory learning.
- Chapters should be read and homework should be attempted before class.
- Do not get behind. You are encouraged to work with other students. Plus, I am always available during office hours to help you.
- The homework assigned is a minimum. You may always work extra hours on your own.
- Use the few minutes you usually have before the start of each class to review the prior meetings' notes and homework. This will save us valuable in-class time to work on new material.
- Develop a learning habit rather than memorizing. Work in groups, whenever appropriate.
- Apply the learned principles and gained knowledge.
- Be creative in thinking, but stick to the topic assigned for discussions, assignments and presentations.
- Always bring your **Work Book** and **Calculator** with you in the class.

Note: Students are welcome all the time in office to get help from the Teacher.

Signature:_____ Date:_____