National University
Of Computer & Emerging Sciences

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	Ability to apply knowledge of mathematics, science and 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.

CLO	Course Learning Outcome (CLO)	Domain	Taxonomy level	PLO	Tools
01	Define the ideas of derivatives and anti-derivatives (integrals) using the concept of limits & continuity and sigma	Cognitive	C1	PLO-1	M, F, A, Q
02	Translate the learning of vector calculus and analytical geometry in multiple dimensions	Cognitive	C1	PLO-1	F, A, Q
03	Apply derivatives and integrals for solving different problems arising in computer sciences.	Cognitive	C1	PLO-1	M, F, A, Q

Text Book(s)	**Title**	Calculus Early Transcendental 10th Edition
	Author	Howard Anton, IRl Bivens, Stephen Davis
	Publisher	JOHN WILEY
Ref. Book(s)	**Title**	Calculus & Analytical Geometry 9th Edition
	Author	George B. Thomas, Ross L. Finney
	Publisher	
	Title	Calculus Early Transcendental 8thEdition
	Author	James Stewart
	Publisher	Thomson, 2008

Week	Contents/Topics	Exercises/Questions	CLO

1	Interval, Inequality, Relation and Functions vertical line test, Piecewise, Absolute value, Introduction to functions Domain and Range, One-One and onto function. Symmetry ,Even/odd function, Asymptote	Appendix **0.1** (1-04, 7-10, 27,28) **0.2**(27-34,53-63,66,67)	-
2	Concepts of limit. Evaluation of limits. Continuity and points of discontinuity. Types of discontinuity.	**1.1** (1-16) **1.2** (1-32) **1.5** (1-6,11-22, 29,30,35,36)	**01**
3	Rules and techniques of differentiation.	**2.3** (1-24, 41-47)	**01**
4	Product and quotient rule. Derivative of trigonometric and logarithm function, Chain rule	**2.4** (1-24) **2.5** (1-24) **2.6** (7-40)	**01**
5	Implicit differentiation. Indeterminate forms, L' Hospital Rule	**3.1** (3-18,25-28) **3.6** (7-45)	**01**
6	**OFF**		
7	Concavity, Increasing and Decreasing. Relative Extreme (1st and 2nd derivative test) Absolute Maxima and Minima	**4.1 (15-30)** **4.2 (7-12, 25-36)** **4.4 (7-16)**	**03**
8	Application of derivatives, Role's and Mean Value's Theorem.	**3.4** (10-20), **4.8** (1-8)	**03**
9	Riemann sums and definite integral	**5.5** (13-24)	**01**
10	Area bounded by the curves. Volume by Disk and washer method	**6.1** (1-18), **6.2** (1-26)	**03**
11	**Mid-Term**		
12	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)	**01**
13	Integration of Rational function by Partial fraction, u= tan(x/2) substitution, Improper integrals.	**7.5** (9-30), **7.6** (65-70) **7.8** (3-32)	**01**
14	Parametric equations of lines in 3D, Plane in 3-space	**11.5**(3-10,15-22,29-34)	**02**
15	Distance Problems involving planes, Intersecting planes.	**11.6**(11-20, 41-48)	
16	**Revision**		

Commented [1]: Chapter 2 will take only 1 lecture and Ex 2.3, 2.4, 2.5 and 2.6 can be given as an assignment. As students are having 6th week off due to Mid-Term 1, it is suggested to assign chapter 2 before that so that they can have a week off to do that.

Commented [2]: Ex: 3.4 is the application of derivatives and the exercise will be given as an assignment after completing chapter 3. (Ex: 3.4 will not be discussed in class)

Marks Distribution:

Mid-Term	30
Assignment	10
Quiz	10
Final	50
Total	100