

Calculus & Analytical Geometry					
Credit Hours	3+0	Course Code	MATH-1121	Pre-requisite	None
Course Objectives:					
Teach the concepts of calculus and analytic geometry and the applications of these concepts to the solution of engineering problems					
Course Outlines:					
Limits And Continuity; Introduction To Functions, Introduction To Limits, Techniques Of Finding Limits, Indeterminate Forms Of Limits, Continuous And Discontinuous Functions And Their Applications, Differential Calculus; Concept And Idea Of Differentiation, Geometrical And Physical Meaning Of Derivatives, Rules Of Differentiation, Techniques Of Differentiation, Rates Of Change, Tangents And Normal Lines, Chain Rule, Implicit Differentiation, Linear Approximation, Applications Of Differentiation; Extreme Value Functions, Mean Value Theorems, Maxima And Minima Of A Function For Single-Variable, Concavity, Integral Calculus; Concept And Idea Of Integration, Indefinite Integrals, Techniques Of Integration, Conic section and quadratic equations Classifying conic section by eccentricity Translation and rotation of axis Properties of circle, parabola, ellipse, hyperbola Polar coordinates, conic sections in polar coordinates Graphing in polar coordinates Tangents and normal, pedal equations, parametric representations of curves					
Course Learning Outcomes (CLOs)					
Course Learning Outcomes (CLO): Upon successful completion of the course, the students will be able to					Mapping to PLOs
CLO1	Use different complex-valued functions such as power, exponential and trigonometric functions in sketching, solving algebraic equations and checking their analyticity.				PLO-1
CLO2	Analyze time-domain periodic and non-periodic functions in their frequency components by using Fourier series and transform.				PLO-2
Reference Material					
- George B. Thomas and Ross L. Finney, "Calculus and Analytic Geometry," Latest Edition, Addison-Wesley, ISBN: 0201531747. - K A Stroud, "Engineering Mathematics", Latest Edition. Macmillan Education, ISBN 0-333-4487-1 - K A Stroud, "Further Engineering Mathematics", Latest Edition. Macmillan Education, ISBN 0-333-52610-4 - Erwin Kreyzig, "Advanced Engineering Mathematics", Latest edition, John Wiley & Sons Inc. - George F. Simmons, "Calculus with Analytic Geometry," Latest Edition, McGraw-Hill, ISBN: 0070576424.					

- Gerald B. Folland, “Advanced Calculus,” Latest Edition, Prentice Hall, ISBN: 0130652652.
- Monty J. Strauss, Gerald L. Bradley and Karl J. Smith, “Calculus”, Latest Edition, Prentice Hall, ISBN: 0130918717