

THE UNIVERSITY OF LAKKI MARWAT Department of Mathematical Sciences

MATH-211 Calculus -1

Contact Hours:

Theory =48

Credit Hours:

Theory = 3.0

COURSE OUTLINE:

S. No	Detailed Contents
01	Preliminaries
	Real numbers and the real line
	Line circle and parabola.
	Mathematical and physical meaning of functions,
	graphs of various functions.
	Trigonometric and logarithmic functions
	Hyperbolic functions.
02	Limits and continuity
	Rate of changes of limits.
	Calculating limit by using limits law.
	Theorems of limits and their applications to functions.
	Some Useful limits.
	Right hand and left hand limits
03	Limits and continuity
	Continuous and discontinuous functions and their
	applications



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04	Differentiation
	Introduction to derivatives.
	Derivate of different functions with details.
	Geometrical and physical meaning of derivatives.
	partial derivatives and their geometrical significance
05	Differentiation
	Geometrical and physical meaning of derivatives.
	partial derivatives and their geometrical significance
06	Application of Derivatives
	Application problems (rate of change, marginal
	analysis) Leibnitz theorem, Rolle's theorem, Mean
	value theorem Taylor's and Maclaurin's series
07	Application of Derivatives
	Indeterminate forms and L Hopital's Rules
	Maxima and Minima of two variables.
08	Application of Derivatives
	Asymptotes, tangents and normals, curvature and
	radius of curvature. differentials with applications
09	Integration
	Methods of integration by substitutions and by parts,
	integration of rational and irrational algebraic
	functions
10	Integration
	Techniques of integrations.
	Definite integrals including improper integrals
11	Application of integration
	Area under curve, volumes by Washers and
	Cylindrical shells,

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12	Application of integration
	Arc length and areas of surfaces of revolution
10	
13	Application of integration
	Volume of parallelepiped and tetrahedron
14	Vectors and Scalar
	Introduction to vectors, Scalar and Vector product of
	three and four vectors
15	Vectors and Scalar
	Vector differentiation
	Applications of Vector Differentiation and Integration
16	Operator, Gradient, Divergence and Curl with their
	applications

> Teaching Methodology

- Lecturing
- Written Assignments
- Quizzes
- > Assessment



- Sessional (25%)
 - Assignments 40%
 - Quizzes 60%
- ➢ Mid Term (25%)
- ➢ Final Term (50%)

Text book:

[1]. Calculus by Thomas Finney, Addison-Wesley Publishing Company, Latest available Edition.

Reference book:

- [1] Mathematics for Engineer 2nd Edition by Robert Davison, Latest available Edition
- [2]. Multivariate Calculus 2nd Edition by Robert T. Smith ,Latest available Edition