SAMRAT ASHOK TECHNOLOGICAL INSTITUTE
(Engineering College), VIDISHA M.P.
(An Autonomous Institute Affiliated to RGPV Bhopal)
Department of Applied Science

Semester/Year		First Sem	Program		B.Tech.
Subject Category	Departmental Core	Subject Code:	BT-1815	Subject Name:	Calculus and Algebra

Maximum Marks Allotted						Contact Hours			Total Credits
Theory			Practical		Total Marks				
End Sem	Mid-Sem	Quiz	End Sem	Lab-Work		L	T	P	
60	20	20	-	-	100	3	1	-	4

Prerequisites:

Basic of Differentiations, Integrations and Matrices.

Course Objective:

The objective of this course is to familiarize the prospective engineers with techniques in calculus, and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

Course Outcomes:

This course is to develop students abilities to:

1. The Essential Tool of Matrices and Linear Algebra in a Comprehensive Manner. Student will understand Matrices and their Application to Solve System of Linear Simultaneous Equations.
2. Students will Gain Experience with Problem Solving in Boolean Algebra and Graph Theory.
3. Apply Differential Calculus to Notions of Curvature. Apart from some other Applications they will have a Basic Understanding of Taylor's Theorem, Maxima and Minima.
4. The Fallouts of Partial Differentiation that is Fundamental to Application of Analysis to Engineering Problems.
5. Finding area and Volume using Double and Triple Integrals.

UNITs	Descriptions	Hrs.	CO's
I	**Matrix :** Definition, Types & Properties of Matrices, Elementary Transformation, Rank of Matrix, Consistency of Linear System of Equations and their solutions, Eigen Values and Eigen Vectors, Cayley Hamilton Theorem and its Application to find the Inverse.	8	1
II	**Boolean Algebra & Graph Theory:** Algebra of logic, Principal of Duality and basic theorem, Boolean expression and Boolean functions, Definition of Graph, Types of Graphs, Sub Graphs, Walk, Path and Circuits, Matrix Representation of Graphs ,Trees and its properties.	8	2
III	**Differential Calculus :**Lebnitz Theorem, Expansion of functions by Maclaurins and Taylors theorem (one variable), Maxima & Minima of two variables, Curvature: Radius and Centre of Curvature for Cartesian Coordinates.	8	3
IV	**Partial Differentiation :** Partial Derivatives of Higher Order, Homogeneous Functions, Euler's Theorem, Total differentiation, Errors and Approximations.	8	4
V	**Integral Calculus :** Definite Integral as a Limit of the Sum, Application in Summation of Series, Multiple Integrals, Change of order of Integration, Application of Double and Triple Integrals (Area & Volume), Beta & Gamma Function.	8	5
TOTAL HOURS		40	

Reference Books:

1. Engg. Mathematics: By B.S. Grewal
2. Boolean Algebra: R.S. Agrawal
3. Engg. Mathematics: by H.K. Dass
4. Engg. Mathematics : By B. V. Rammanna