MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (Autonomous)
B.Tech. I and II Semester
Scheme of Instruction and Examination
[Common to EEE & ECE]
(Choice Based Credit System)
For the batches to be admitted with effect from the academic year **2021-22**

I Semester

S.No.	Course Code	Course Title	Instruction Hours Per Week			Examination Max. Marks		Duration of SEE in Hours	Credits
			L	T	P/D	CIE	SEE		
		Induction Program							
1	MA101BS	Mathematics-I	3	1	0	30	70	3	**4**
2	PH102BS	Applied Physics	3	1	0	30	70	3	**4**
3	CS101ES	Programming for problem solving	3	1	0	30	70	3	**4**
4	ME101ES	Engineering Graphics	1	0	4	30	70	3	**3**
5	MC101ESC	Environmental Science	3	0	0	30	70	3	**0**
6	PH152BS	Applied Physics Lab	0	0	3	30	70	3	**1.5**
7	CS151ES	Programming for problem solving Lab	0	0	3	30	70	3	**1.5**
		Total Hours/Marks/Credits	**13**	**3**	**10**	**210**	**490**		**18**

II Semester

S. No.	Course Code	Course Title	Instruction Hours Per Week			Examination Max. Marks		Duration of SEE in Hours	Credits
			L	T	P/D	CIE	SEE		
1	EN201HS	English	2	0	0	30	70	3	**2**
2	MA202BS	Mathematics-II	3	1	0	30	70	3	**4**
3	CH201BS	Chemistry	3	1	0	30	70	3	**4**
4	EE201ES	Basic Electrical Engineering	3	0	0	30	70	3	**3**
5	EN251HS	The English Language and Communication skills Lab	0	0	2	30	70	3	**1**
6	CH251BS	Engineering Chemistry Lab	0	0	3	30	70	3	**1.5**
7	ME251ES	Engineering Workshop	1	0	3	30	70	3	**2.5**
8	EE251ES	Basic Electrical Engineering Lab	0	0	2	30	70	3	**1**
		Total Hours/Marks/Credits	**12**	**2**	**10**	**240**	**560**		**19**

L: Lecture   T: Tutorial   D: Drawing   P: Practical

CIE - Continuous Internal Evaluation SEE - Semester End Examination

L	T	P	C
3	1	0	4

B.Tech. I Semester
MA101BS: Mathematics-I
(Common to all Branches)

Course Objectives

To learn
• The concept of the rank of a matrix and applying it to know the consistency and solution of the system of linear equations.
• The concept of eigen values and eigen vectors and to reduce the quadratic form to canonical form.
• Concept of Sequences and Series.
• Geometrical approach to the mean value theorems and their application and evaluation of improper integrals using Beta and Gamma functions.
• The concept of partial differentiation, total derivative and finding maxima and minima of function of two and three variables.

Course Outcomes

After learning the contents of this paper, the student must be able to
• Write the matrix representation of a set of linear equations and analyze the solution of the system of equations.
• Find the eigen values and eigen vectors & reduce the quadratic form to canonical form using orthogonal transformations.
• Analyze the nature of sequences and series.
• Evaluate the improper integrals using Beta and Gamma functions.
• 5. Find the extreme values of functions of two variables with/ without constraints.

Unit-I: Matrices

Types of Matrices - Real Matrix, Symmetric, Skew-Symmetric and Orthogonal Matrices, Complex matrix, Hermitian, Skew-Hermitian and Unitary Matrices; Elementary Transformations, Definition of rank of a Matrix, Computation of rank of a matrix by reducing it into Echelon form and Normal form; Inverse of a Matrix by Gauss-Jordan method; System of linear equations-Solution of Homogeneous Systems, Consistency and Solution of system of Non-Homogeneous linear equations by Rank Method; Direct Method-Gauss elimination method; Indirect Method-Gauss Jacobi Method, Gauss Seidel Iteration Method.

Unit-II: Eigen values and Eigen vectors

Definition of Vectors, Norm of a vector, Linearly dependent, Linearly independent and Orthogonal Vectors; Linear Transformation and Orthogonal Transformation, Eigen values and Eigenvectors and their properties; Diagonalization of a Matrix, Modal Matrix, Normalised Modal Matrix; Cayley-Hamilton Theorem (without proof), finding inverse and power of a Matrix by Cayley-Hamilton Theorem; Quadratic Forms, Index, Signature and Nature of the Quadratic Forms, reduction of Quadratic Form to Canonical Forms by Orthogonal Transformation.

Unit-III: Sequences & Series

Sequence: Definition of a Sequence, Limit, Convergent, Divergent and Oscillatory Sequences; Series: Convergent, Divergent and Oscillatory Series; Geometric Series Test; Series of positive terms- Comparison test, p-test, D-Alembert's ratio test, Raabe's test, Cauchy's Integral test, Cauchy's n^{th} root test, Logarithmic test; Alternating series; Leibnitz test, Absolute and Conditionally Convergence.

Unit-IV: Calculus

Basic concepts of limit, continuity and differentiability of function of single variables; Mean value theorems: Rolle's Theorem, Lagrange's mean value theorem with their geometrical interpretation and applications, Cauchy's mean value Theorem. Taylor's series; Definition of Improper Integral: Beta, Gamma functions and their properties.