



Gyanmanjari
Innovative University

Course Syllabus
Gyanmanjari Institute of Technology
Semester-1

Subject: Basic Mathematics- BETXX10204

Type of course: Multidisciplinary

Prerequisite: Basic of algebra, Trigonometry, Geometry

Rationale: Basic mathematics is to support struggling students in developing a solid mathematical foundation, fostering confidence and motivation, closing achievement gaps, and equipping them with essential skills for future academic and personal success.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks					Total Marks
CI	T	P		Theory Marks		Practical Marks		CA	
			ESE	MSE	V	P	ALA		
4	0	0	4	60	30	10	-	50	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Continuous Assessment:

Sr. No.	Active Learning Activities	Marks
1.	Assignment: Unit wise assignment will be given. Five numerical per assignment.	10
2.	Functionality of scientific calculator: List of functions will be assigned by faculty. Students have to prepare the flowchart for solution and upload to the MOODLE (in group of three students).	10
3.	Puzzle: Various problems based on series, geometry, clock, calendar etc. will be assigned to the students. Students need to submit Mathematical logic and solution via MOODLE (in group of three students).	10
4.	Quiz: Unit wise MCQ test. 10 MCQ per unit.	10
5.	Student's choice activity relevant to course.	10
Total		50



Course Content:

Unit No.	Course content	Hrs	% Weightage
1	Chapter-1: Matrices and Determinants Introduction of Matrix and its types, Matrix operations: addition, Multiplication of matrix with a scalar and with another matrix, Determinants, properties of determinants, Minors and co-factors, Adjoint of a square matrix, singular and non-singular matrices, inverse of a matrix, solution of system of linear of equations using matrix method	10	25%
2	Chapter-2: Analytical Geometry Signs of the Coordinates of a Cartesian system, Distance formula, Straight line: Introduction, equations of line parallel to axes, Slope or gradient of a line, Slope of line joining two points, conditions for parallel and perpendicular lines, Slope-intercept form of line, Distance of a point from a line.	10	25%
3	Chapter-3: Functions Introduction of Functions, Domain, Range, Real valued functions and its Classification, Defining function using Venn diagram Chapter-4: Logarithms Introduction of Logarithm, Properties of logarithms, Common logarithms; Chapter-5: Limits Introduction of Limit, Limit of a function at a point, Properties of limits, Indeterminate forms and L'Hospital's rule, Standard limits, Continuity of a functions.	12	25%
4	Chapter-6: Differentiation Derivative by first principle, derivative of sum, difference, product and quotient of functions, Derivatives of standard functions (without proof), derivative of composite functions, chain rule, derivative of implicit functions, derivative of functions expressed in parametric forms, second order derivatives. Chapter-7: Integration Integration as an anti-derivative, Integration of standard functions, Integration by substitution, by partial fractions and by parts, Basic properties of definite integrals, evaluation of definite integrals.	13	25%



Course Outcome:

After learning the course, the students should be able to:	
CO1	Apply mathematical tool for practical applications of matrix theory in fields such as Image processing, computer graphics, signal processing and Machine learning etc.
CO2	Construct geometric proofs related to properties of lines, angles, and curves in a coordinate system.
CO3	Identify points of continuity and removable discontinuities using limit.
CO4	Use integration to solve problems involving area under curves, work done, volume of solids of revolution, and other real-world applications.

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MCQetc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

[1] Basic Mathematics by Serge Lang.

[2] Mathematics: A Complete Introduction by Hugh Neill.

[3] Pre-algebra and Introductory Algebra by Richard N. Aufmann and Joanne S. Lockwood.

[4] Basic Math and Pre-Algebra Workbook for Dummies by Mark Zegarelli.

