B.A./B.Sc.I (SEMESTER-II) Calculus & Matrices (Minor Paper)

Programme: Certificate Class: B.A./B.Sc.	Year: First	Semester: First / Second
Subject: Mathematics		
CourseCode:B030202T	Course Title: Calculus & Matrices(Minor Paper)	

Course outcomes:

CO1: The subjects of the course are designed in such a way that they focus on developing mathematical skills in Calculus.

CO2: The student will be able to find the type, rank, Eigen values of matrices.

Credits:6	Minor
Max.Marks:25+75	Min. Passing Marks:

Calculus & Matrices (Minor Paper)

Unit	Topics	No. of Lectures
I	Definition of the limit of a function, Continuous functions and classification of discontinuities, Differentiability, Chain rule of differentiability, Rolle's theorem, Mean value theorems, Successive differentiation and Leibnitz's theorem., Expansion of functions (in Taylor's and Maclaurin's series), Indeterminate forms, Partial differentiation , Euler's theorem, Jacobians, Maxima and Minima (for functions of two variables), Tangents and normals.	25
II	Beta and Gamma functions, Quadrature, Rectification, Volumes and surfaces of solids of revolution, Pappus theorem, Double a and triple integrals, Change of order of integration, Dirichlet's and Liouville's integral formulae.	20
III	Vector differentiation and integration, Gradient, divergence and curl and their properties, Line integrals, Theorems of Gauss, Green and Stokes and problems based on these.	20
IV	Matrix, Determinant, properties of Matrices, Symmetric and skew-symmetric Matrices, Hermitian and skew-Hermitan Matrices, Orthogonal and Unit-ary Matrices, Triangular and diagonal matrices, Rank of a Matrix, Elementary transformations, Echelon and normal forms, Inverse of a Matrix, Characteristic equation, Eigen values and Eigen vectors of a Matrix, Cayley-Hamilton's theorem and its use in finding inverse of a Matrix.	25

Books Recommended

1 T.M.Apostal, CalculusVol.I, JohnWiley&SonsInc.

2 S.BalachandraRao&C.K.Shantha, DifferentialCalculus, NewAgePublication.

3. Rao G Shanker, Linear Algebra, 1st Edition, I. K. International Publisher

4. StephenH.Friedberg, A.JInsel&L.E.Spence, LinearAlgebra, Person

16-10-2024

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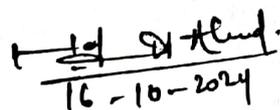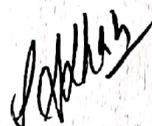
Suggested Continuous Evaluation Methods: Max. Marks: 25	
Assessment Type	Max. Marks
Class Tests	10
Online Quizzes/Objective Tests	5
Presentation/Research Orientation assignment	5
Assignment	5
Course pre requisites :To study this course, a student must have subject Mathematics in class 12th	
Suggestedequivalentonlinecourses:	
FurtherSuggestions:	

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Differential Equation & Integral Transforms (Minor)

Programme: Diploma Class: B.A./B.Sc.	Year: Second	Semester: Third / Fourth
Subject: Mathematics		
Course Code:B030402T	Course Title : Differential Equation & Integral Transforms (Minor)	

Course outcomes:

CO1: The objective of this course is to familiarize the students with various methods of solving differential equations, partial differential equations of first order and second order and to have qualitative applications.

CO2: The object of the paper is to give students knowledge of Integral Transforms with applications.

Credits:4	Core Compulsory / Elective / Minor
Max. Marks:25+75	**Min. Passing Marks:**

Differential Equation & Integral Transforms (Minor)

Unit	Topics	No. of Lectures
I	Formation of a differential equation (D.E.), Degree, order and solution of a D.E., Equations of first order and first degree : Separation of variables method, Solution of homogeneous equations, linear equations and exact equations, Linear differential equations with constant coefficients, Homogeneous linear differential equation.	25
II	Differential equations of the first order but not of the first degree, Clairaut's equations and singular solutions, Orthogonal trajectories, Simultaneous linear differential equations with constant coefficients, Linear differential equations of the second order (including the method of variation of parameters)	20
III	Linear differential equations of the second order (including the method of variation of parameters). Order, degree and formation of partial differential equations, Partial differential equations of the first order, Solution of partial differential equations. Lagrange's equations, Charpit's general method,	20
IV	The concept of transform, Integral transforms and kernel, Linearity property of transforms, Laplace transform, Inverse Laplace transform, Convolution theorem, Applications of Laplace transform to solve ordinary differential equations. Fourier transforms (finite and infinite), Fourier integral, Applications of Fourier transform to boundary value problems, Fourier series.	25

Suggested Readings

1. G.F. Simmons, Differential Equations with Application and Historical Notes, Tata– McGraw Hill
2. B. Rai, D.P. Choudhary & H.J.Freedman, A Course of Ordinary Differential Equations, Narosa
3. IanN.Snedden,ElementsofPartialDifferentialEquations,DoverPublication
4. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons.

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SN	Assessment Type	Max. Marks
1	Class Tests	10
2	Online Quizzes / Objective Tests	5
3	Presentation / Research Orientation assignment	5
4	Assignment	5
Course pre requisites: To study this course, a student must have Certificate Course in Applied Mathematics		
Suggested equivalent online courses:		