LESSON PLAN

SUBJECT: MATHEMATICS II

BRANCH: COMMON

SEMESTER: 2ND (2024-25)

NAME OF THE FACULTY:

S.C. ROUT (Principal) &
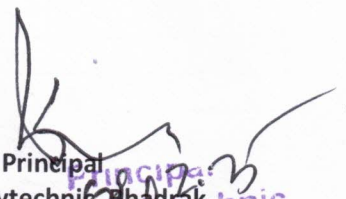
MANAS KUMAR MAHALIK(Lecturer S II in Mathematics)

GOVERNMENT POLYTECHNIC, BHADRAK

HOD, Math& Sc   Academic Coordinator   Principal
Govt. Polytechnic, Bhadrak

Academic Co-ordinator

Principal
Govt. Polytechnic
Bhadrak

GOVERNMENT POLYTECHNIC, BHADRAK

LESSON PLAN

Course Code:	TH3	Classes per week:	4
Course Title:	Mathematics- II	**Name of the Faculty:** . Sri Manas Kumar Mahalik and Sri S.C. Rout(Principal)	
Number of Credits:	4 (L:4,T:0,P:0)	**Designation:** Lecturer S-II in Mathematics	
Number of Week Allotted:	15	**Semester Start from** 04.02.2025 **to** 17.05.2025	

Week	Class	Chapter	Detailed topic to be covered
1st	1st	UNIT - I: Determinants & Matrices	**Determinants & Matrices** Determinant and its Expansion up to 3rd order
	2nd		Expansion of determinant using Sara's Rule. Minors & Cofactors. Properties of Determinant
	3rd		Application/ Examples on Properties of Determinant
	4th		Examples on Properties of Determinant
2nd	1st		Solving System of linear equation using Cramer's Rule.
	2nd		Define: Matrix and its order. Types of matrices with examples
	3rd		Equality of matrices. Algebra of matrices(Addition & Subtractions & Multiplication of matrices)
	4th		Orthogonality Test, Express a matrix into sum of symmetric & skew-symmetric matrices
3rd	1st		Inverse of a square matrix
	2nd		Solving system of linear equation using matrix inversion method
	3rd		Mixed problem practice/solving
	4th	UNIT-II Integral Calculus	Introduction to Integration
4th	1st		Simple Integration by Substitution
	2nd		Integration by Substitution (Continued)
	3rd		Integration by Parts - Introduction
	4th		Integration by Parts (Continued)
5th	1st		Integration by Partial Fractions (Linear Factors)
	2nd		Integration by Partial Fractions (Continued)
	3rd		Integration Using Standard Formulas
	4th		Integration of Powers of Sine and Cosine

6th	1st		$\int_0^{\Pi/2} sin^n x\,dx$ and $\int_0^{\Pi/2} cos^n x\,dx$
	2nd		Applications of Integration - Area under a Curve
	3rd		Applications of Integration - Area under a Curve (Continued)
	4th		Applications of Integration - Volume of Solids
7th	1st		Volume of Solids (Continued)
	2nd		Review and Problem Solving
	3rd	UNIT-III Co-ordinate Geometry	Introduction to Coordinate Geometry & Equation of a Straight Line
	4th		General Form of Straight Line and Practice
8th	1st		Intersection of Two Straight Lines
	2nd		Angle Between Two Lines
	3rd		Parallel and Perpendicular Lines
	4th		Perpendicular Distance from a Point to a Line
9th	1st		Introduction to Circles
	2nd		Finding the Equation of a Circle (Centre and Radius)
	3rd		Equation of a Circle (Given 3 Points)
	4th		Equation of a Circle (End Points of a Diameter)
10th	1st		Conic Sections - Introduction
	2nd		Parabola
	3rd		Ellipse
	4th		Hyperbola
11th	1st		Conics Review and Problem Solving
	2nd		Mixed Problem Session
	3rd		Mixed Problem Session
	4th		Mixed Problem Session
12th	1st		Final Review & Assessment
	2nd	UNIT-IV Vector Algebra	Introduction of scalar & vector, Representation of vector. Magnitude and direction of a vector, Types of vector- Null Vector, Unit Vector, Parallel Vector, Negative Vector, Co-initial & Co-terminal Vector, Co-planer Vector, Free Vector and Equal Vector
	3rd		Vector Operation: Triangle law of Vector Addition. Properties of vector addition. Parallelogram law of vector addition. Multiplication of a vector with a scalar.
	4th		Component form of vectors: 2D & 3D. addition and scalar multiplication of vectors, magnitude and unit vector in terms of component form
13th	1st		Multiplication of vectors: (i)Scalar Product or Dot Product and its properties
	2nd		Application of dot product: Work Done
	3rd		(ii) Vector Product or Cross product and its

			properties
	4th		Application of vector product: Area of triangle & Parallelogram Momentum of Force Angular Velocity
14th	1st		Problem Practice
	2nd	UNIT-V Differential Equation	Definition of ODE, PDE, a) Order and degree of a differential equation Determining Order and degree of a differential equation with examples
	3rd		b) Solution of differential equation Definition i) By method of separation of variable with examples TYPE-I: Differential Equation is in the form $\frac{dy}{dx} = f(x)$
	4th		TYPE-II: Differential Equation is in the form $\frac{dy}{dx} = g(y)$ TYPE-III: Differential Equation is in the form $\frac{dy}{dx} = f(x)g(y)$
15th	1st		Introduction to MATLAB
	2nd		Basic of MATLAB
	3rd		Advantages & Disadvantages of MATLAB
	4th		Keyboard shortcuts of MATLAB

Mahalte 01/02/2025
Signature of the faculty

Manas Kumar Mahalik
Lecturer S II in maths.

Govt. Polytechnic
Bhadrak