

UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLOGY, RAYAGADA**Academic Lesson Plan for 1st Semester – 2023 (Winter)**

Name of the teaching faculty: Sri Pradeep Kumar Tripathy,
Lecturer (Mathematics)

Dept.: Department of Mathematics & Science

Semester : 1st

Subject : Theory 3 : Engg. Mathematics-I

No of Periods per week: 5 + 1(Tutorial) = 6,

Total Periods: 75,

End semester Exam.: 80 Marks,

Class test: 20 Marks,

Total Marks: 100 Marks

Week	Period	Unit / Chapter	Topics to be covered
1st	1 st	Unit-1	Unit-1: Matrices and Determinant Introduction to Determinant, Some related definitions, Elements, Row, Column, Order, Diagonal elements, Symbolic form, Leading term, Expansion of 2 nd order determinant.
	2 nd	Unit-1	Minor, Cofactor, Expansion of third order determinant, Properties of determinant with examples.
	3 rd	Unit-1	Product of determinants with examples.
	4 th	Unit-1	Solve related Problems.
	5 th	Unit-1	Solve related Problems.
	6 th (T)		Doubt Clear / Revision class.
2nd	1 st	Unit-1	Solve related Problems
	2 nd	Unit-1	State Cramer's Rule, Different types of solutions by using Cramer's rule.
	3 rd	Unit-1	Solve related Problems.
	4 th	Unit-1	Solve related Problems.
	5 th	Unit-1	Introduction to Matrices, Order, Symbolic form, Types of matrices: Row matrix, Column matrix, Zero/Null matrix, Square matrix, Diagonal matrix, Scalar matrix, Unit/ Identity matrix, Non-Singular and Singular matrix, Transpose of matrix.
	6 th (T)		Copy checking and Test based on Determinants.
3rd	1 st	Unit-1	Equality matrices with examples and solve the related problems, Addition and Subtraction of matrices with properties and examples.

	2 nd	Unit-1	Multiplication of matrices with examples and solve related problems.
	3 rd	Unit-1	Solve related problems.
	4 th	Unit-1	Solve related problems.
	5 th	Unit-1	Solve related problems.
	6 th (T)		Doubt Clear / Revision class.
4 th	1 st	Unit-1	Adjoint of matrices and solve related problems. Inverse of a matrix and solve related problems.
	2 nd	Unit-1	Procedure for solve the system of equations by matrix method and solve related problems.
	3 rd	Unit-2	Trigonometry Introduction to Co-ordinate systems: Cartesian and Polar co-ordinate system.
	4 th	Unit-2	Trigonometric ratios, Trigonometric functions, Trigonometric Identities, ASTC rule, Signs of T-ratios, Solve related problems.
	5 th	Unit-2	T-ratios of special angles, T-ratios of allied angles, Solved related problems.
	6 th (T)		Copy checking and Test based on Matrices.
5 th	1 st	Unit-2	Addition and Subtraction formulae, Solve related problems.
	2 nd	Unit-2	Transformation of a product into sum or difference and vice-versa. Solved related problems.
	3 rd	Unit-2	Solved related problems.
	4 th	Unit-2	Solved related problems.
	5 th	Unit-2	Introduction to Inverse trigonometric functions
	6 th (T)		Doubt Clear / Revision class.
6 th	1 st	Unit-2	Properties of Inverse circular trigonometric function.
	2 nd	Unit-2	Properties of Inverse circular trigonometric function.
	3 rd	Unit-2	Solve related problems.
	4 th	Unit-2	Solve related problems.
	5 th	Unit-2	Solve related problems.
	6 th (T)		Copy Checking and Doubt clear class
7 th	1 st	Unit-3	Co-ordinate Geometry (Two-Dimensional) Introduction to Co-ordinate Geometry (Two-Dimensional), Cartesian and Polar co-ordinate system, Convection regarding signs in Cartesian system.

	2 nd	Unit-3	Distance formula and solve its related problems.
	3 rd	Unit-3	Division / section formulae (Internal & External division formulae, Mid-point formula, Solve related problems.
	4 th	Unit-3	Area of a Triangle, Co-linear Condition, Solve related problems.
	5 th	Unit-3	Locus and its equation. Method to find the equation of a locus, Solve related problems, Definition and equation of a straight line.
	6 th (T)		Copy checking and Test based on Distance formula, Division formulae and Area of Triangle.
8th	1 st	Unit-3	Slope of a line, Solve related problems.
	2 nd	Unit-3	Angle between two lines, Parallel and perpendicular conditions, Solve related problems.
	3 rd	Unit-3	Different forms of straight lines, Slope-intercept form, One point form, Two point form, Solve related problems.
	4 th	Unit-3	Intercept form, Perpendicular form, Solve related problems.
	5 th	Unit-3	Equation of a line passing through a point and Solve related problems, Equation of a line parallel with another line and Solve related problems, Equation of a line perpendicular with another line and Solve related problems,
	6 th (T)		Doubt clear / Revision class.
9th	1 st	Unit-3	Equation of a line passing through the intersection of two lines and Solve related problems,
	2 nd	Unit-3	Distance of a point from a line, Distance between two parallel lines, Solve related problems.
	3 rd	Unit-4	Circle Definition and equation of a circle (Central form), Equation of a circle in different condition,
	4 th	Unit-4	Solve related problems based on central form and different conditions.
	5 th	Unit-4	Solve related problems based on central form and different conditions.
	6 th (T)		Copy checking and Test based on Straight lines.
10th	1 st	Unit-4	General equation of a circle, Find the centre and radius from general equation of circle, Characteristics

			of equation of circle.
	2 nd	Unit-4	Solve its related problems based on general equation of circle.
	3 rd	Unit-4	Solve its related problems based on find the equation of circle satisfying certain given conditions. Concentric circles and solve its related problems.
	4 th	Unit-4	Diameter form and solve related problems.
	5 th	Unit-5	Co-ordinate Geometry (Three-Dimensional) Introduction to Co-ordinate geometry in three dimensional, Image of the point and solve its problems.
	6 th (T)		Copy checking and Test based on Circle.
11th	1 st	Unit-5	Distance formula, Solve related problems.
	2 nd	Unit-5	Division formula (Internal & External division formula), Mid point formula, Solve related problems.
	3 rd	Unit-5	Direction cosines and direction ratios of a line, Relation between direction cosines and direction ratios of a line, Calculate direction ratios when two points are given, Solve related problems.
	4 th	Unit-5	Projection of a line segment on another line. Angle between two lines, Condition of parallel and perpendicular of two lines. Solve related problems.
	5 th	Unit-5	Introduction to Plane, Equation of plane passing through a point and whose normal has given directional cosines. Solve related problems
	6 th (T)		Doubt clear / revision class
12th	1 st	Unit-5	General form of equation of plane, Equation of plane under different conditions: Equation of plane passing through three given points, Co-planer condition for four points, Solve related problems.
	2 nd	Unit-5	Equation of a plane parallel to given plane, Solve related problems.
	3 rd	Unit-5	Equation of a plane passing through intersection of two given planes. Solve related problems.
	4 th	Unit-5	Equation of plane in different forms: Equation of plane in intercept form, Solve related problems.
	5 th	Unit-5	Equation of plane in Normal form, Solve related problems.
	6 th (T)		Copy checking and Test based on Introduction to three dimensional Geometry.

13th	1 st	Unit-5	Angle between two intersecting planes, Condition of parallel, coincident and perpendicular planes, solve related problems.
	2 nd	Unit-5	Perpendicular distance of a point from the plane, Solve related problems.
	3 rd	Unit-6	Sphere Locus of a sphere, Equation of sphere having centre and radius, Solve related problems.
	4 th	Unit-6	General equation of a sphere, Characteristics of general equation of sphere, Solve related problems.
	5 th	Unit-6	Equation of sphere passing through four given points, Solve related problems.
	6 th (T)		Doubt Clear / Revision / Test on Plane / Sphere.
14th	1 st	Unit-6	Diameter form, Solve related problems.
	2 nd		Revision on Determinant.
	3 rd		Revision on Matrices.
	4 th		Revision on Introduction to Trigonometry, Allied angles, Add and subtraction of angles, Multiple of angles.
	5 th		Revision on Inverse Trigonometric function.
	6 th (T)		Revision on Introduction to Coordinate Geometry, Distance Formula, Division Formula, Area of Triangle.
15th	1 st		Revision on Straight line.
	2 nd		Revision on Circle.
	3 rd		Revision on Introduction to Co-ordinate Geometry.
	4 th		Revision on Plane.
	5 th		Revision on Sphere.
	6 th (T)		Very Similar Test.

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