

GOVERNMENT POLYTECHNIC, NUAPADA

LESSON PLAN

Discipline: Civil, Computer Sc., Electrical and Mechanical Engg.	Semester: 1 st	Name of the Teaching Faculty: Manas Ranjan Sahu (Lect. in Mathematics)
Subject: Engg. Math-I	No of Days/per week class allotted: 6P (5 Lectures +1 Tutorial)	Semester From Date: 16.08.2023 to Date: 11.12.2023 No. of Weeks: 15
Week	Class Day	Theory Topics
		<u>UNIT-I: MATRICES & DETERMINANT</u>
1ST	1 st	Define: Matrix and its order. Types of matrices with examples
	2 nd	Equality of matrices. Algebra of matrices(Addition & Subtractions)
	3 rd	Problem solving based on algebra of matrices
	4 th	Multiplication of matrices with examples
	5 th	Problem solving on matrix multiplication
2ND	1 st	Determinant and its Expansion
	2 nd	Minors & Cofactors. Properties of Determinant
	3 rd	Application/ Examples on Properties of Determinant
	4 th	-Do-
	5 th	-Do-
3RD	1 st	Inverse of a matrix (2x2 matrix)
	2 nd	Inverse of a matrix (3x3 matrix)
	3 rd	Problem based on previous class
	4 th	Solution of simultaneous equations by Cramer's Rule
	5 th	Problem based on previous class

4TH	1 st	Solution of simultaneous equations by matrix inverse method
	2 nd	Problem based on previous class
	3 rd	Problem based on previous class
	4 th	<p style="text-align: center;"><u>UNIT-II: TRIGONOMETRY</u></p> System of Measurements of angles. Trigonometric ratios of angles of any magnitude Sign convention (ASTC Rule) Domain & range of Trigonometric function
	5 th	Compound angles, multiple and sub-multiple angles
5TH	1 st	Problem based on previous class
	2 nd	Problem based on previous class
	3 rd	Problem based on previous class
	4 th	Problem based on previous class
	5 th	Conditional Trigonometric Identities
6TH	1 st	Problem based on previous class
	2 nd	Problem based on previous class
	3 rd	<u>Properties Of Triangles</u> : Notations. Sine Law, Cosine Law, Projection Law, Half-Angle formula.
	4 th	Napier's /Tangent formula. Area of Triangle- Heron's formula.
	5 th	Problem based on previous class
7TH	1 st	Problem based on previous class
	2 nd	<u>Inverse Trigonometric Function</u> : Define inverse function. Domain, Range and Graph. Properties of Principal Inverse Function.
	3 rd	Problem Solving on inverse trigonometric function.
	4 th	<p style="text-align: center;"><u>UNIT-III: CO-ORDINATE GEOMETRY IN TWO DIMENSION</u></p> Introduction of geometry in two dimension Distance formulae, division formulae, area of a triangle
	5 th	Problem based on previous class

8TH	1 st	Define slope of a line, angle between two lines (only Formulae), condition of perpendicularity and parallelism.
	2 nd	Problem based on previous class
	3 rd	Different forms of straight lines One point form two point form slope form intercept form Perpendicular form
	4 th	Problem based on previous class
	5 th	Problem based on previous class
9TH	1 st	Equation of a line passing through a point and (i) parallel to a line (ii) Perpendicular to a line
	2 nd	Problem based on previous class
	3 rd	Problem based on previous class
	4 th	Equation of a line passing through the intersection of two lines
	5 th	Problem based on previous class
10TH	1 st	Distance of a point from a line.
	2 nd	<u>UNIT-IV: CIRCLE</u>
	3 rd	Define: Circle. Equation of a circle in Center-Radius form
	4 th	Equation of circle in Two End-points of a Diameter form
	5 th	Problem based on previous class
11TH	1 st	General Equation of sphere. Equation of Circle passing through 3-points
	2 nd	Problem based on previous class
	3 rd	Problem based on previous class
	4 th	<u>UNIT-V: CO-ORDINATE GEOMETRY IN THREE DIMENSIONS</u>
	5 th	Distance formulae, section formulae in 3D and its application
	5 th	Problem based on previous class

12TH	1 st	Direction ratio, direction cosine, angle between two lines and its application
	2 nd	Problem based on previous class
	3 rd	Problem based on previous class
	4 th	condition of parallelism and perpendicularity
	5 th	Problem based on previous class
13TH	1 st	Concept of Parallelepiped/ Cuboid
	2 nd	Problem based on previous class
	3 rd	Equation of plane- Different forms of equation plane: Points-Normal form 3-points form Intercepts form Normal form
	4 th	Problem based on previous class
	5 th	Condition for co-planarity And problem based on it.
14TH	1 st	Angle between two planes. Perpendicular Distance of a point from a plane.
	2 nd	Equation of a plane passing through a point and i) parallel to a plane (ii) perpendicular to a plane
	3 rd	Problem based on previous class
	4 th	<u>UNIT-VI: SPHERE</u> Define: Sphere. Equation of a sphere in Center-Radius form
	5 th	Problem based on previous class
15TH	1 st	Equation of Sphere in Two End-points of a Diameter form
	2 nd	Problem based on previous class
	3 rd	General Equation of sphere.
	4 th	Problem based on previous class
	5 th	Equation of sphere passing through 4-points

Teaching Faculty

Program Coordinator
(Math & Sc.)

Academic Coordinator

Principal
Government Polytechnic
Nuapada