

# GOVERNMENT POLYTECHNIC, KORAPUT

## LESSON PLAN

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

		UNIT II: TRIGONOMETRY
	4 <sup>th</sup>	System of Measurements of angles. Trigonometric ratios of angles of any magnitude Sign convention (ASTC Rule) Domain & range of Trigonometric function
	5 <sup>th</sup>	Compound angles, multiple and sub-multiple angles
	6 <sup>th</sup>	Tutorial
5TH	1 <sup>st</sup>	Problem based on previous class
	2 <sup>nd</sup>	Problem based on previous class
	3 <sup>rd</sup>	Problem based on previous class
	4 <sup>th</sup>	Problem based on previous class
	5 <sup>th</sup>	Conditional Trigonometric Identities
	6 <sup>th</sup>	Tutorial
6TH	1 <sup>st</sup>	Problem based on previous class
	2 <sup>nd</sup>	Problem based on previous class
	3 <sup>rd</sup>	<u>Properties Of Triangles</u> : Notations. Sine Law, Cosine Law, Projection Law, Half-Angle formula.
	4 <sup>th</sup>	Napier's /Tangent formula. Area of Triangle- Heron's formula.
	5 <sup>th</sup>	Problem based on previous class
	6 <sup>th</sup>	Tutorial
7TH	1 <sup>st</sup>	Problem based on previous class
	2 <sup>nd</sup>	<u>Inverse Trigonometric Function</u> : Define inverse function. Domain, Range and Graph. Properties of Principal Inverse Function.
	3 <sup>rd</sup>	Problem Solving on inverse trigonometric function.
	4 <sup>th</sup>	UNIT III: CO-ORDINATE GEOMETRY IN TWO DIMENSION Introduction of geometry in two dimension Distance formulae, division formulae, area of a triangle
	5 <sup>th</sup>	Problem based on previous class
	6 <sup>th</sup>	Tutorial
8TH	1 <sup>st</sup>	Define slope of a line, angle between two lines (only Formulae), condition of perpendicularity and parallelism.
	2 <sup>nd</sup>	Problem based on previous class
	3 <sup>rd</sup>	Different forms of straight lines One point form two point form slope form intercept form Perpendicular form
	4 <sup>th</sup>	Problem based on previous class
	5 <sup>th</sup>	Problem based on previous class

	6 <sup>th</sup>	Tutorial
9TH	1 <sup>st</sup>	Equation of a line passing through a point and (i) parallel to a line (ii) Perpendicular to a line
	2 <sup>nd</sup>	Problem based on previous class
	3 <sup>rd</sup>	Problem based on previous class
	4 <sup>th</sup>	Equation of a line passing through the intersection of two lines
	5 <sup>th</sup>	Problem based on previous class
	6 <sup>th</sup>	Tutorial
10TH	1 <sup>st</sup>	Distance of a point from a line.
	2 <sup>nd</sup>	UNIT IV: CIRCLE Define: Circle. Equation of a circle in Center-Radius form
	3 <sup>rd</sup>	Problem based on previous class
	4 <sup>th</sup>	Equation of circle in Two End-points of a Diameter form
	5 <sup>th</sup>	Problem based on previous class
	6 <sup>th</sup>	Tutorial
11TH	1 <sup>st</sup>	General Equation of sphere. Equation of Circle passing through 3-points
	2 <sup>nd</sup>	Problem based on previous class
	3 <sup>rd</sup>	Problem based on previous class
	4 <sup>th</sup>	UNIT V: CO-ORDINATE GEOMETRY IN THREE DIMENSIONS Distance formulae, section formulae in 3D and its application
	5 <sup>th</sup>	Problem based on previous class
	6 <sup>th</sup>	Tutorial
12TH	1 <sup>st</sup>	Direction ratio, direction cosine, angle between two lines and its application
	2 <sup>nd</sup>	Problem based on previous class
	3 <sup>rd</sup>	Problem based on previous class
	4 <sup>th</sup>	condition of parallelism and perpendicularity
	5 <sup>th</sup>	Problem based on previous class
	6 <sup>th</sup>	Tutorial
13TH	1 <sup>st</sup>	Concept of Parallelepiped/ Cuboid
	2 <sup>nd</sup>	Problem based on previous class
	3 <sup>rd</sup>	Equation of plane- Different forms of equation plane: Points-Normal form 3-points form Intercepts form Normal form
	4 <sup>th</sup>	Problem based on previous class
	5 <sup>th</sup>	Condition for co-planarity And problem based on it.
	6 <sup>th</sup>	Tutorial

14TH	1 <sup>st</sup>	Angle between two planes. Perpendicular Distance of a point from a plane.
	2 <sup>nd</sup>	Equation of a plane passing through a point and i) parallel to a plane (ii) perpendicular to a plane
	3 <sup>rd</sup>	Problem based on previous class
	4 <sup>th</sup>	Define: Sphere. Equation of a sphere in Center-Radius form
	5 <sup>th</sup>	Problem based on previous class
	6 <sup>th</sup>	Tutorial
15TH	1 <sup>st</sup>	Equation of Sphere in Two End-points of a Diameter form
	2 <sup>nd</sup>	Problem based on previous class
	3 <sup>rd</sup>	General Equation of sphere.
	4 <sup>th</sup>	Problem based on previous class
	5 <sup>th</sup>	Equation of sphere passing through 4-points
	6 <sup>th</sup>	Tutorial

*Patya*  
16/8/23

(HOD Maths & C)

*Debi*  
16.08.2023

Debi Prasad Tripathy,  
Leet. Mathematics