

BLACK DIAMOND SCHOOL OF ENGINEERING, JHARSUGUDA

**LESSON PLAN
Session (2022-2023)**

Discipline: All Branches	Semester: 1 st , Winter/2022	Name of the Faculty:	
		Swarna Manjari Patel Lect.	
Subject: Engg.Math, Theory-3	No.of Days/Week: 05+01(TC)	Start Date: 24-10-2022 End Date: 20-02-2023	

WEEK	CLASS DAY	THEORY TOPICS
1st	1st	Introduction to syllabus and evaluation scheme
	2nd	Define matrix and its representation, state its order, State types of matrices with examples.
	3rd	Perform addition, subtraction of matrices with example
	4th	scalar multiplication of matrices and related problems
	5th	Multiplication of two matrices in different orders with related problems
	6th	Tutorial class of the above portions
2nd	1st	Assignment discussion on Addition ,subtraction and multiplication of matrices
	2nd	Determinant of square matrix, minors and cofactors of elements
	3rd	Cofactor matrix and its problems
	4th	Transpose of a matrix and adjoint of a matrix and related problems
	5th	Explain inverse of a matrix up to third order and related problems
	6th	Tutorial class on Adjoint and inverse of a matrix
3rd	1st	Assignment discussion on Adjoint and inverse of a matrix
	2nd	Solution of simultaneous equations by matrix method with two unknowns with related problems
	3rd	Assignment Discussion on simultaneous linear equations
	4th	Class Test-1 on Matrix
	5th	Explain determinants up to second order and related problems
	6th	Tutorial Class on Simultaneous LE and Determinant of order 2 ,Previous year questions
4th	1st	Explain determinants of third order and related problems
	2nd	Explain properties of determinants
	3rd	Problem Discussion using properties of Determinant

	4th	Explain Cramer's rule (solution of simultaneous equations of two unknowns) with problems
	5th	Assignment Discussion on Determinant
	6th	Tutorial Class on Determinant
5th	1st	Preliminary ideas of Trigonometric functions and trigonometric ratios
	2nd	Define Degree and Radian, conversion of degree and radians , Trigonometric identities and ratios
	3rd	Problems on above portions
	4th	Assignment on Trigonometric Identities
	5th	Compound and multiple angles like $2A$, $3A$ ----Formulas on $\sin(A+B)$, $\sin(A-B)$, $\cos(A+B)$ ---with related problems
	6th	Tutorial Class on Trigonometry
6th	1st	Remember formula on $\sin 2A$, $\cos 2A$, $\sin 3A$, $\cos 3A$ ----and solve related problems
	2nd	Quiz Test-1 on Matrix , Determinant and trigonometry
	3rd	sub-multiple angles like $A/2$, $A/3$ and remember formulas on Sub-multiple angles
	4th	Problems on sub-multiple angles
	5th	Assignment on Multiple and Sub-multiple angles
	6th	Tutorial class on Multiple and Sub-multiple angles
7th	1st	Define inverse circular functions and study its properties, Domain and range of inverse trigonometric function
	2nd	Remember formulas of ITF and solve related problems
	3rd	Problems on ITF
	4th	Assignment discussion on ITF
	5th	Class Test -2 on Determinant and Trigonometry
	6th	Tutorial class on ITF
8th	1st	Introduction of Geometry ,Define co-ordinates of a point on a plane in Cartesian form
	2nd	Derive formula for distance between two given points on a plane and related problems
	3rd	Area of triangle whose vertices are given, Collinear of three points and condition of collinearity with related problems
	4th	Division point in the ratio $m:n$ between two given points both internally and externally and midpoint of a line segment with related problems
	5th	Assignment discussion on Distance ,Area and Division formula
	6th	Tutorial class on Area and Division Formula
9th	1st	Define slope of a line and explain slope of line in different positions and solve related problems
	2nd	Derive angle between two lines , Condition of perpendicularity and parallelism of two lines with related problems
	3rd	Assignment discussion on sloe and angle between two lines
	4th	Define locus and equation of locus from the given conditions, Equation of a line parallel to x-axis and y-axis

	5th	Derive standard forms of straight lines slope in intercept form and slope point form and related problems
	6th	Tutorial class on slope, angle and locus
10th	1st	Derive standard forms of straight lines slope in two point form, intercept form and normal form and related problems
	2nd	State general equation of straight line and remember formula for x-intercept, y-intercept and slope. Solve related problems
	3rd	Transformation of general form $ax+by+c=0$ into slope- intercept and normal form and related problems
	4th	Determine point of intersection of two straight lines and related problems
	5th	Assignment Discussion on locus and different forms of equations
	6th	Tutorial class on locus and different forms of equations and previous year questions
11th	1st	Equation of straight line passing through a point of intersection of two straight lines and parallel to a line, perpendicular to a line with related problems
	2nd	Equation of straight line passing through a point of intersection of two straight lines and a given point with related problems
	3rd	Determine perpendicular distance from a point to a line and distance between two parallel lines
	4th	Assignment discussion on straight line
	5th	Class Test-3 on 2-Dimensional geometry (chapter-1 and Straight line)
	6th	Tutorial class on equation of a line parallel ,perpendicular and distance from a point
12th	1st	Define circle and its equation with given centre and radius with related problems
	2nd	Explain equation of circle when it touches coordinate axes, Derive circle equation with given end points of a diameter and related problems
	3rd	Derive general equation of circle and determine its centre and radius
	4th	Find equation of circle passing through three non-collinear points
	5th	Assignment Discussion on Circle
	6th	Tutorial class on Circle
13th	1st	Describe coordinate of a point in space in rectangular coordinate system
	2nd	Derive distance formula and solve related problems
	3rd	Remember division formula and solve related problems
	4th	Explain direction cosines and direction ratios of a line and drs of line segment joining two points with related problems
	5th	Angle between two lines with given drs and dcs ,condition of parallelism and perpendicularity with related problems
	6th	Quiz Test-2 on ITF,2-Dimensional Geometry
14th	1st	Assignment on 3- Dimensional Geometry (Chapter-1)
	2nd	State equation of plane and find equation of plane in one point form and three point form and problems on it

	3rd	Equation of a plane in Intercept form ,General form and angle between two planes with conditions, related problems
	4th	Equation of a plane parallel to a plane and perpendicular to the planes with related questions
	5th	Perpendicular distance from a point to a plane, distance between two parallel planes, transformation from general form to intercept form
	6th	Tutorial class on plane
15th	1st	Assignment Discussion on plane
	2nd	Define sphere and its equation when centre and radius given & problems
	3rd	General equation of sphere, equation of a sphere on given end points of a diameter with related problems
	4th	Equation of sphere passing through four non coplanar points
	5th	Assignment Discussion on Sphere and previous year questions discussion
	6th	Class Test-4 on Circle and 3-Dimensional Geometry