ACADEMIC LESSON PLAN OF ENGG.MATH-I (2022) (WINTER)

Subject: Engg. Math-I

Discipline	Name of teaching faculty: Sushree Swadhinpriya Mohapatra	
Subject-Engg.Mathematics - I(Th-3)	Semester from date: 25.10.2022 To 31.01.2023 No.of Week:15	
Week	Class Day	THEORY
1st (25th oct to 31st oct)	1st	What is matrix, definition, row matrix, column matrix, null matrix Examples base this theory.
	2nd	Unit matrix, singular matrix and non-singular matrix with examples.
	3rd	Addition, subtraction of matrix with examples.
	4th	Multiplication of a scalar matrix, matrix multiplication with examples.
	5th	What is determinant, definition, how to find determinant with examples.
	6th	All properties of determinant.
2nd (1st Nov to 7th Nov)	1st	Examples bases on properties.
	2nd	Definition of minors and cofactors and examples base on it.
	3rd	What is adjoint matrix with examples.

	4th	Properties of adjoint matrix with more examples on adjoint matrix .
	5th	Doubts clear and quiz.
	6th	What is Cramer's rule. Theory base on Cramer's rule.
3rd **(8th Nov to 14th Nov)**	**1st**	Examples on Cramer's rule.
	2nd	Properties and examples.
	3rd	Doubts and quiz.
	4th	What is simultaneous equation .How to convert into matrix form, with examples.
	5th	How to solve simultaneous equation with examples.
4th **(15th Nov to 21st Nov)**	**1st**	Doubts and quiz.
	2nd	Introduction to measurement of different angles and trigonometric ratios.
	3rd	Trigonometric functions and Identity-1
	4th	Quadrants and Signs of T-ratios
	5th	Limits of T-ratios and ASTC rules
	6th	Values of T-ratios of allied angles
5th **(22nd Nov to 28th Nov)**	**1st**	Theorem-1,2,3: (Addition Theorems)
	2nd	Prove that sin50-sin70+sin10=0 and similar problems Prove that If A+B+C=π Sin2A+sin2B+sin2C=4sinAsinBsinC and more problems

	3rd	Transformation of a Product into a Sum or Difference, and Vice-versa
	4th	Compound, Multiple and Sub Multiple Angles Multiple and Sub Multiple Arguments
	5th	Find sin18, cos36, $\sin 22\frac{1}{2}$,$\cos 22\frac{1}{2}$ Prove that $\cos\frac{\pi}{16}=\sqrt{2+\sqrt{2+\sqrt{2}}}$
	6th	INVERSE TRIGONOMETRIC FUNCTIONS
6th (29th Nov to 5th Dec)	**1st**	Properties of Inverse Trigonometric Functions 1. Self adjusting property
	2nd	2. Reciprocal Property 3. Conversion property
	3rd	Problems on inverse trigonometry
	4th	Doubts and quiz
	5th	Introduction to 2D, and some fundamental concepts, coordinate system, Representation of any point (x, y) on the cartesian plane
	6th	Distance formula, section formula, Midpoint formula and examples
7th (6th Dec to 12nd Dec)	**1st**	Centroid Formula, Incentre of a triangle and solved problems
	2nd	Area of Triangle, collinearity of three points, examples
	3rd	Slope or Gradient of a line, slope of a line joining two points and some examples
	4th	Condition of perpendicular and parallelism, problems
	5th	Intercepts of a line on the axes, Different forms of straight line((i)Slope intercept form (ii) one-point form) and examples
	6th	(iii)Two-point form, (iv)intercept form and problems

8th (13rd Dec to 19th Dec)	**1st**	(v)Normal form/Perpendicular form and some solved problems
	2nd	Problems on all of the above, Transformation of general equation in different standard forms and examples
	3rd	Equation of a line passing through a point (i)parallel to a line(ii)perpendicular to a line and examples
	4th	Intersection of two lines, concurrency , perpendicular distance ,Distance between two parallel lines and problems
	5th	Doubt clearing and quiz
	6th	Introduction to Circle and its equation in centre Radius form
9th (20th Dec 26th Dec)	**1st**	some particular cases and examples
	2nd	General Equation circle and examples
	3rd	Equation of circle passing through three points and examples
	4th	Equation of a circle with given end points of a diameter and some problems
	5th	Some problems and exercise
10th (27th Dec to 2nd Jan)	**1st**	More problems on circle
	2nd	Introduction to 3-D,Distance formula and examples
11th (3rd Jan to 9th Jan)	**1st**	Section formula ,Direction cosines ,Direction ratios and Examples
	2nd	Direction Ratios and Direction cosines and examples
	3rd	Projection of the line segment on another line. Angle between two line. Condition of parallelism and perpendicularity
	4th	Problems on the above and exercise
	5th	Equation of plane in general form and examples
	6th	Problems on above, exercises

12th (10th Jan 16th Jan)	**1st**	Equation of plane passing through a point and whose normal has given directional cosines
	2nd	(i)Equation of plane passing through three given points and coplanar conditions for four points and examples
	3rd	(ii)Equation of plane parallel to a given line (iii)Equation of plane passing through intersection of two given planes and examples
	4th	Equations of plane in different form (i) Normal form and examples
	5th	(ii)intercept form and examples on the above
13th (17th Jan to 23rd Jan)	**1st**	Angle between two intersecting lines and some special case and examples
	2nd	Perpendicular distance of a point from the line and some problems
	3rd	Doubt clearing and quiz
	4th	Introduction to sphere
	5th	Equation of sphere having centre at (a ,b ,c) and radius r and some problems
	6th	General form of sphere and some problems on it
14th (24th Jan to 30th Jan)	**1st**	Equation of sphere when end points of diameter are given and examples
	2nd	Equation of sphere passing through four given point and some problems
	3rd	More problems on sphere and exercise problems
	4th	Doubt clearing and quiz
	5th	Revision classes
15th (31st Jan)	**1st**	**Revision classes**

Kishore Kumar Ader

Signature of teaching faculty