LESSON PLAN(2023-24-S)

Discipline /All Branches	Semester-2nd	Name of the teaching faculty:- Sri Sarada Ku. Nayak Sr.Lect. in (Mathematics), Math & Sc. Deptt., GP, Sonepur
Subject:- Engg. Math-II	No. of days per week-05	Semester from date:29.01.24 to 14.05.2024 No. of weeks :-15 (excluding vacation)
Week	Class day	Theory
	lst	Introduction to scalars and vectors, different types of vector
lat	2nd	Operations on vectors (addition, subtraction and multiplication of a vector by a scalar)
131	3rd	Position vector, Section formula, Illustrative examples
	4th	Components of vector in 2-D, 3-D, magnitude of vector, illustrative examples.
	5th	Distance between two points by vectors method, problem discussion
	1st	Product of vectors, Scalar or dot product of two vectors, geometrical meaning of scalar product, properties of scalar product
2-4	2nd	Illustrative examples, components of vector along and perpendicular to a vector
Znd	3rd	Illustrative examples exercise problem discussion
	4th	Angle between two vectors, scalar and vector projection of two vectors
	5th	Illustrative examples, exercise problem discussion
	1st	vector product (Cross product) of vectors, geometrical meaning and properties.
	2nd	Vector product of orthonormal triads of unit vectors, illustrative examples
3rd	3rd	Area of triangle and parellologram, illustrative examples
	4th	Problems discussion and doubt clearing
	5th	Exercise problem discussion
	1 st	Definition of function, domain and range of a function, types of function
	2nd	Constant function, Identity function, absolute value function
4th	3rd	Greatest integer function, trigonometric function
	4th	Exponential function, logarithmic function, introduction to limit
	5th	Limit of a function, left hand and right hand limit, existence of limit

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		a strating limit
	1st	Illustrative examples, methods of evaluating material and a standard stationalization method,
		Direct substitution method, factorization method, family
	2nd	Direct substitution and
		illustrative examples
5th	2-4	Dividing highest power of x by both man
	310	examples and problem discussion
		Standard identities:-
	4th	Standard Resident
		(i) $\frac{x^n - a^n}{a}$, (ii) $\frac{a^{x-1}}{a}$ as $x \to 0$
		(x - a) = (x - a) = (x - a)
		Illustrative examples
		X 1 $(1,1)$ $(2,1)$ $(2,1)$
	Sth	Limit of $\frac{x-1}{x}$ as $x \to 0$ and $\ln(1+x)$ as $x \to 0$
		Illustrative examples
	lst	$(a+1)^n = a$
		(i) $\lim_{n \to \infty} \left(1 + \frac{1}{n} \right)^n = e^n$
		1
		(ii) $\lim_{n \to \infty} (1+n)^n = e$
6th		Illustrative examples
	2nd	$\text{Limit of } \frac{\sin x}{x}, \frac{\tan x}{x} \text{ as } x \to 0$
		Illustrative examples
	3rd	Definition of continuity of a function at a point and problem based on it
	510	Deminion of continuity of a function at a point and problem case a com-
	4th	Illustrative examples based on continuity
	5th	Problem discussion and doubt clearing
	1st	Introduction to differential calculus, derivative of a function at a point
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	2nd	Algebra of differentiation
7th		
	3rd	Derivative of standard functions:-
		$x^{n}, a^{n}, n(x), e^{n}, \sin(x), \cos(x), \tan(x), \cot(x), \sec(x), \csc(x),$
		$\sin^{-1}x$, $\cos^{-1}x$, $\tan^{-1}x$, $\cot^{-1}x$, $\sec^{-1}x$, $\csc^{-1}x$
		,
	4th	Continue
	5th	Continue
	lst	Continue
	0.1	Continue
	2nd	
8th		
	3rd	Derivative of a composite function, illustrative examples
	4th	Continue, problem discussion
	Sth	Derivative of inverse trigonometric function
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	2nd	Differentiation by trigonometric transformation
9th	3rd	Continue
	4th	Differentiability
	5th	Relation between differentiability and continuity
	lst	Derivative of parametric function, illustrative examples
	2nd	Derivative of implicit function, illustrative examples
10th	3rd	Derivative of function w.r.t another function, illustrative examples
	4th	Logarithmic differentiation, illustrative examples
	5th	Continue
	lst	Problem discussion
	2nd	Successive differentiation, illustrative examples
1 lth	3rd	Partial differentiation
	4th	Continue
	5th	Problem discussion
	lst	Definition of integration as inverse of differentiation
	2nd	Some standard formulae of integration with examples
12th	3rd	General properties of integration, illustrative examples
	4th	Methods of integration, (i) Substitution Illustrative examples
	5th	Continue
13th	1st	Integration by using trigonometric identities, trigonometric substitution, illustrative examples
	2nd	Integration by parts, illustrative examples
	3rd	Integration of the form (i) $\int \frac{dx}{x^2 + a^2}$, (ii) $\int \frac{dx}{x^2 - a^2}$, (iii) $\int \frac{dx}{a^2 - x^2}$
		illustrative examples

	4th	Integration of the form
		(i) $\int \frac{dx}{\sqrt{x^2+a^2}}$,
		(ii) $\int \frac{dx}{\sqrt{x^2-a^2}},$
		(iii) $\int \frac{dx}{\sqrt{a^2 - x^2}}$
		(iv) $\int \frac{dx}{x\sqrt{x^2+a^2}}$
		$(\mathbf{v}) \qquad \int \sqrt{x^2 - a^2} dx$
		(vi) $\int \sqrt{x^2 + a^2} dx$
		(vii) $\int \sqrt{a^2 - x^2} dx$
		illustrative examples
	5th	Definite integral, illustrative examples
14th	1 st	Properties of definite integrals, illustrative examples
	2nd	Application of integration
		(i) Area enclosed by a curve and x-axis
		(ii) Area of arcle with centre at origin
	3rd	Problem discussion
	4th	Introduction to differential equation, order and degree of a differential equation
	5th	Solution or differential equation of 1st order and 1 st degree
15th	lst	Rottem discussion
	2nd	Linear differential equation, illustrative examples
	3rd	Continue
	4th	Problem discussion
	5th	Problem discussion, end of syllabus

Prepared By Sarada Kumar Nayak

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