KIIT POLYTECHNIC, BHUBANESWAR

LESSON PLAN
Session (2022-2023)

Discipline: All Branches	Semester: 2nd Summer/2023	Name of the Faculty:	
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Subject: Engg.Math-II, Theory-3	**No.of Days/Week:** 05+01(TC)	**Start Date:** 20-03-2023 **End Date:** 27-06-2023	

WEEK	CLASS DAY	THEORY TOPICS
1st	1st	Introduction to syllabus and evaluation scheme
	2nd	Introduction to vector , Scalar quantity and vector quantity, Representation of vector
	3rd	Types of vectors(null vector, parallel vector, Equal vectors, collinear vectors, unit vector)
	4th	Magnitude and direction of vectors Addition and subtraction of vectors, Position vector,
	5th	Resolution of vectors into components and related problems
	6th	Tutorial class of the above portions
2nd	1st	Assignment discussion
	2nd	Scalar product of two vectors and its geometrical meaning, Angle between two vectors
	3rd	Scalar and vector projection of two vectors , Work done
	4th	Problems on Scalar Product
	5th	Assignment Discussion on scalar Product
	6th	Tutorial class on scalar product
3rd	1st	Vector product and its geometrical meaning(area of triangle and parallelogram)
	2nd	Problems on vector product
	3rd	Assignment Discussion on vector product
	4th	Class Test-1 on Vectors
	5th	Define variables and constants with examples, Definition of function ,Domain and range of a function.
	6th	Tutorial Class on vectors and previous year questions discussion
4th	1st	Define real valued function with examples, Define different types of

		functions like rational, trigonometric ,inverse trigonometric with examples
	2nd	Define different types of functions like exponential, logarithmic, modulus, greatest integer functions , Signum with examples
	3rd	Explain Limit of a function and related discussion , Explain types of limit: Left hand limit(LHL) and Right hand limit(RHL),Related problems.
	4th	Problems on existence of the limit of a function
	5th	Explain Finite limit, State fundamental theorem of Limits such as addition, subtraction, multiplication , division and related problems
	6th	Tutorial Class on limit
5th	1st	Explain limits at infinity and related problems
	2nd	State standard formulas of limits like $\lim_{x\to a}\dfrac{x^n-a^n}{x-a}$, $\lim_{x\to 0}\dfrac{e^x-1}{x}$, $\lim_{x\to 0}\dfrac{a^x-1}{x}$ and solve related problems
	3rd	$state\ formulas\ of\ limits\ \lim_{x\to 0}\dfrac{\ln(1+x)}{x},$ $\lim_{x\to 0}\dfrac{sinx}{x}, \lim_{x\to 0}\dfrac{tanx}{x}, \lim_{x\to 0}(1+x)^{\frac{1}{x}},$ $\lim_{x\to\infty}(1+1/x)^x,$ and solve related problems
	4th	Define continuity of a function at a point Continuity problems on algebraic, trigonometric, exponential, modulus, greatest integer, signum function
	5th	Assignment discussion on limits and continuity
	6th	Tutorial Class on Limits and Continuity
6th	1st	Quiz Test-1 on Vector Algebra, limits and continuity
	2nd	Introduction and Define derivative of a function at a point, Explain geometrical and physical meaning of dy/dx
	3rd	Standard derivatives of functions such as x^n, e^x, a^x , lnx using 1st principle methods and solve related problems
	4th	Standard derivatives of functions such as sin x, cos x, tan x, cot x, sec x, cosec x from first principle method
	5th	Fundamental theorems on derivative like addition, subtraction, multiplication and division rule ,discussed related problems
	6th	Tutorial class on derivative
7th	1st	Assignment discussion on derivative
	2nd	Explain composite function and its derivative Solve related problems
	3rd	Problems on derivative of composite function
	4th	Define formula for derivative of functions sin^{-1}x,cos^{-1}x,tan^{-1}x,Sec^{-1}x,cosec^{-1}x,cot^{-1}x and discussed related problems
	5th	Assignment discussion on chain rule and inverse trigonometric function
	6th	Tutorial class on chain rule and inverse trigonometric function
8th	1st	Differentiation by using logarithm with examples

	2nd	Derivative by substitution with problems
	3rd	Explain implicit functions and their problems
	4th	Assignment discussion on implicit, substitution and by using logarithm
	5th	Differentiation of parametric functions and solve their problems
	6th	Tutorial class on implicit, substitution , parametric and by using logarithm and
9th	1st	Differentiation of a function with respect to another function
	2nd	Assignment discussion on Parametric and function w.r.to a function
	3rd	Define successive differentiation up to 2nd order and solve related problems
	4th	Solve problems on successive derivative
	5th	Assignment discussion on successive derivative
	6th	Tutorial class and previous year questions discussion on Derivative
10th	1st	Class test-2 on limit and derivative up to 2nd order
	2nd	Explain functions of several variables, state partial derivative up to two independent variables and solve related problems
	3rd	Solve problems on Partial Derivative(PD)
	4th	State homogeneous function and Euler's Theorem of two variables with examples
	5th	Assignment discussion on PD
	6th	Tutorial class and previous year questions discussion on PD
11th	1st	Define integration as inverse process of differentiation and integrals of standard functions with related problems
	2nd	Problems on integration using standard formulas
	3rd	Integration by substitution and related problems
	4th	Assignment discussion on standard problems and using substitution method
	5th	Integration of some trigonometric functions and related problems
	6th	Tutorial class on integration of standard functions, substitution and trigonometric functions
12th	1st	Define integration of different forms like $$\int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{a^2 + x^2}, \int \frac{dx}{\sqrt{a^2 + x^2}},$$ $\int \frac{dx}{\sqrt{x^2-a^2}}, \int \frac{dx}{x\sqrt{x^2-a^2}}$,and related problems
	2nd	Solve related problems by using above formulas
	3rd	Assignment Discussion
	4th	Explain Integration by parts formula and solve related problems
	5th	Solve related problems by using integration by parts
	6th	Tutorial class on integration by parts
13th	1st	Assignment Discussion on Integration by parts
	2nd	Define integration of different forms

		like $\int \frac{dx}{a^2-x^2}, \int \frac{dx}{x^2-a^2}, \int \sqrt{a^2-x^2}dx$ $\int \sqrt{a^2+x^2}dx, \int \sqrt{x^2-a^2}dx$ and related problems
	3rd	Problems on the above formulas
	4th	Assignment Discussion on above formulas
	5th	Tutorial class on Integration and previous year questions discussion
	6th	Class Test-3 on Indefinite Integration
14th	1st	Define definite integrals and their properties, Solve related problems
	2nd	Solve problems on Definite integration
	3rd	Area bounded by the curve y=f(x),x=a,x=b and X-axis , curve x=f(y),y=a,y=b and Y-axis, Area of a circle with centre at origin and related problems
	4th	Assignment Discussion on Definite integration and Area under plane curves
	5th	Define DE ,ODE, PDE, order and degree of ODE with examples
	6th	Tutorial class on Definite integration and Area under plane curves
15th	1st	Solution of ODE on 1st order and 1st degree with different techniques, solve related problems
	2nd	Problems on ODE 1st order and 1st degree with different techniques
	3rd	Quiz Test-2 on Derivative and Integration
	4th	Define LDE and the form $\frac{dy}{dx} + Py = Q$,Solve related problems
	5th	Assignment Discussion on ODE and previous year questions discussion
	6th	Class Test-4 on Definite Integration, Area and ODE