



LESSON PLAN

Department of Mathematics and Science

Bhubanananda Orissa School of Engineering, Cuttack

Academic Session: 2023-24 (summer)

SEMESTER: 2nd SEM BRANCH: Civil SEC:A

SUBJECT: ENGINEERING MATHEMATICS-II

Prepared by:

SUNANDA MOHAPATRA

LECTURER (MATHEMATICS)

DISCIPLINE /BRANCH : CIVIL	SEMESTER:2 ND		NAME OF THE TEACHING FACULTY: SUNANDA MOHAPATRA
SUBJECT: ENGINEERING MATHEMATICS -II	NO. OF S PER WEEK CLASS ALLOTTED: 5 Classes + 1 Tutorial		SEMESTER FROM: Date:01/02/2024 to 14/05/2024
WEEK	CLASS & DATES		THEORY TOPICS
	CLASS	DATES	
1 st	1.	01.02.24	a) Introduction, Syllabus discussion
	2.	02.02.24	Tutorial class
	3.	03.02.24	Unit 1-vector (15p) b) Types of vectors (null vector, parallel vector , collinear vectors)
	4.	05.02.24	c) Representation of vector (in component form) d) Magnitude and direction of vectors
2 nd	5.	06.02.24	e) Addition and subtraction of vectors f) Position vector
	6.	07.02.24	Problems based on above
	7.	08.02.24	Unit 1-vector (15p) g) Scalar product of two vectors
	8.	09.02.24	Tutorial class: Problems based on above
	9.	10.02.24	h) Geometrical meaning of dot product i) Angle between two vectors
3 rd	10.	12.02.24	j) Scalar and vector projection of two vectors
	11.	13.02.24	Unit 1-vector(15p) k) Vector product and geometrical meaning
	12.	14.02.24	Tutorial class :Problems based on above
	13.	15.02.24	l)Application (Area of triangle and parallelogram)
	14.	16.02.24	Problems based on above

	15.	17.02.24	Evaluation of Assignment Unit-1
4 th	16.	19.02.24	Unit-2-LIMITS AND CONTINUITY (12p) a) Definition of function based on set theory
	17.	20.02.24	Tutorial class: problems based on it
	18.	21.02.24	iv) The Greatest integer function v) Trigonometric function vi) Exponential function .vii) Logarithmic function
	19.	22.02.24	c) Introduction of limit
	20.	23.02.24	d) Existence of limit
	21.	24.02.24	Unit-2-LIMITS AND CONTINUITY (12p) e) Methods of evaluation of limit
5 th	22.	26.02.24	Tutorial class: Class test-1
	23.	27.02.24	UNIT-2-LIMITS AND CONTINUITY(12p) f) Some standard form of limit i) $\lim_{x \rightarrow 0} \frac{x^n - a^n}{x - a} = na^{n-1}$ ii) $\lim_{x \rightarrow 0} \frac{a^x - 1}{x} = \log_e a$
	24.	28.02.24	UNIT-2-LIMITS AND CONTINUITY(12p) f) Some standard form of limit iii) $\lim_{x \rightarrow 0} \frac{e^x - 1}{x} = 1$ iv) $\lim_{x \rightarrow 0} (1 + x)^{1/x} = e$ v) $\lim_{x \rightarrow \infty} \left(1 + \frac{1}{x}\right)^x = e$
	25.	29.02.24	UNIT-2-LIMITS AND CONTINUITY(12p) f) Some standard form of limit vi) $\lim_{x \rightarrow 0} \frac{\log(1+x)}{x} = 1$
	26.	01.03.24	UNIT-2-LIMITS AND CONTINUITY(12p) f) Some standard form of limit vii) $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$

	27.	02.03.24	problems based on it
6 th	28.	04.03.24	Tutorial class: Evaluation of assignment Unit-2
	29.	06.03.24	UNIT-3 DERIVATIVES (21p) a) Derivative of a function at a point
	30.	07.03.24	b) Algebra of derivative
	31.	09.03.24	problems based on it
7 th	32.	11.03.24	c) Derivative of standard functions $x^n, a^x, \log_a x, e^x, \sin x, \cos x, \tan x, \cot x, \sec x, \csc x, \sin^{-1} x, \cos^{-1} x,$ $\tan^{-1} x, \cot^{-1} x, \sec^{-1} x, \csc^{-1} x$
	33.	12.03.24	UNIT-3-DERIVATIVES (21p) d) Derivative of composite function (Chain Rule)
	34.	13.03.24	Tutorial class: problems based on it
	35.	14.03.24	problems based on it
	36.	15.03.24	e) Methods of differentiation. Trigonometric function
	37.	16.03.24	problems based on it
8 th	38.	18.03.24	UNIT-3-DERIVATIVES (21p) Methods of differentiation. Inverse Trigonometric function and substitution.
	39.	19.03.24	Tutorial class: Problems based on above
	40.	20.03.24	Method of differentiation (continue) ii) Implicit function
	41.	21.03.24	Problems based on it
	42.	22.03..24	iii) Logarithmic function
	43.	23.03.24	Problems based on it
9 th	44.	27.03.24	UNIT-3-DERIVATIVES (21p) iv) a function with respect to another function

	45.	28.03.24	Tutorial Class: Problems based on it
	46.	30.03.24	f) Applications of Derivative: i) Successive Differentiation (up to second order)
10 th	47.	02.03.24	Problems based on it
	48.	03.04.24	ii) Partial Differentiation (function of two variables up to second order)
	49.	04.04.24	Problems based on it Evaluation of Assignment Unit-3
	50.	05.04.24	Tutorial Class: CLASS TEST-2
	51.	06.04.24	UNIT-4 INTEGRATION (15p) Definition of integration as inverse of differentiation
11 th	52.	08.04.24	problems based on it
	53.	09.04.24	b) Integrals of standard functions
	54.	10.04.24	problems based on it
	55.	12.04.24	UNIT-4 INTEGRATION (15p) Methods of integration i) Integration by substitution
	56.	13.04.24	Tutorial class: problems based on above.
12 th	57.	15.04.24	ii) Integration by parts
	58.	16.04.24	problems based on it
	59.	18.04.24	Unit 4 INTEGRATION(15p) d) Integration of some standard forms d) Integration of the following forms i) $\int \frac{dx}{x^2+a^2}$ ii) $\int \frac{dx}{x^2-a^2}$ iii) $\int \frac{dx}{a^2-x^2}$ iv) $\int \frac{dx}{\sqrt{x^2+a^2}}$ v) $\int \frac{dx}{\sqrt{x^2-a^2}}$ vi) $\int \frac{dx}{\sqrt{a^2-x^2}}$ vii) $\int \frac{dx}{x\sqrt{x^2-a^2}}$ viii) $\int \sqrt{a^2-x^2} dx$ ix) $\int \sqrt{a^2+x^2} dx$ x) $\int \sqrt{x^2-a^2} dx$
	60.	19.04.24	problems based on it

	61.	20.04.24	Unit 4 INTEGRATION (15p) e) Definite integral, properties of definite integrals i) $\int_0^a f(x) dx = \int_0^a f(a-x) dx$ ii) $\int_a^b f(x) dx = - \int_b^a f(x) dx$ iii) $\int_a^c f(x) dx = \int_a^b f(x) dx + \int_b^c f(x) dx$, $a < b < c$ iv) $\int_{-a}^a f(x) dx = 0$, if $f(x)$ = odd $= 2 \int_0^a f(x) dx$, if $f(x)$ = even
13 th	62.	22.04.24	Tutorial class: Problem based on above
	63.	23.04.24	Application of integration Area enclosed by a curve and X – axis ii) Area of a circle with centre at origin
	64.	24.04.24	problem based on above.
	65.	25.04.24	Evaluation of Assignment unit-4
	66.	26.04.24	Unit 5 DIFFERENTIAL EQUATION (12p) a) Order and degree of a differential equation
	67.	27.04.24	problem based on above.
14 th	68.	29.04.24	Unit 5 DIFFERENTIAL EQUATION (12p) b) Solution of differential equation
	69.	30.04.24	Tutorial class: problems based on it.
	70.	01.05.24	1st order and 1st degree equation by the method of separation of variables.
	71.	02.05.24	problems based on it.
	72.	03.05.24	Unit 5 DIFFERENTIAL EQUATION (12p) ii) Linear differential equation general form ii) Linear equation $\frac{dy}{dx} + Py = Q$, where P,Q are functions of x and its solution
	73.	04.05.24	problems based on it.

15 th	74.	06.05.24	Evaluation of Assignment Unit-5
	75.	07.05.24	CLASS TEST-3
	76.	08.05.24	Revision
	77.	09.05.24	Revision
	78.	10.05.24	Previous year question discussion _2023
	79.	11.05.24	Previous year question discussion _2022
16 th	80.	13.05.24	Previous year question discussion _2021
	81.	14.05.24	VST

Ar
01.02.24