



Lesson Plan

Department of Mathematics and Science

Bhubanananda Orissa School of Engineering, Cuttack

Academic Session :- (2022-23_Summer)

SEMESTER: 2nd SEM **BRANCH:** Mechanical Civil

SUBJECT: ENGINEERING MATHEMATICS-II

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DISCIPLINE /BRANCH : (SEC: A)	SEMESTER:2 ND	NAME OF THE TEACHING FACULTY: Bijayini Nayak Goutam Paroda
SUBJECT: ENGINEERING MATHEMATICS -II	NO. OF DAYS/PER WEEK CLASS ALLOTTED:	SEMESTER FROM: Date:20/03/2023 to 27/06/2023
WEEK	CLASS DAYS & DATES	THEORY TOPICS
1 st	Day1:20..03.23	a) Introduction, Syllabus discussion
	Day2:21..03.23	Unit 1-vector (15p) b) Types of vectors (null vector, parallel vector , collinear vectors)
	Day3:22..03.23	c) Representation of vector (in component form) d) Magnitude and direction of vectors
	Day4:23..03.23	e) Addition and subtraction of vectors f) Position vector
	Day5:24..03.23	Problems based on above
	Day6:25..03.23	Unit 1-vector (15p) g) Scalar product of two vectors
2 nd	Day7:27.03.23	Tutorial class
	Day8:28.03.23	h) Geometrical meaning of dot product i) Angle between two vectors
	Day9:29.03.23	j) Scalar and vector projection of two vectors
	Day10:31.03.23	Unit 1-vector(15p) k) Vector product and geometrical meaning
3 rd	Day11:03.04.23	Tutorial class

	Day13:04.03.23	Problems based on above
	Day13:05.03.23	I)Application Area of triangle and parallelogram
	Day14:06.03.23	Problems based on above
	Day15:08.03.23	Unit-2-LIMITS AND CONTINUITY (12p) a) Definition of function based on set theory
4 th	Day17:10.04.23	Tutorial class
	Day18:11.04.23	iv)The Greatest integer function v) Trigonometric function
	Day18:12.04.23	vi) Exponential function .vii) Logarithmic function
	Day19:13.04.23	Unit-2-LIMITS AND CONTINUITY (12p) d) Existence of limit
	Day20:15.04.23	e) Methods of evaluation of limit
5 th	Day21:17.04.23	Tutorial class: Class test-1
	Day22:18.04.23	problems based on it
	Day23:19.04.23	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) $\lim_{x \rightarrow 0} \frac{a^x - 1}{x} = \log_e a$
	Day24:20.04.23	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) $\lim_{x \rightarrow \infty} \left(1 + \frac{1}{x}\right)^x = e$
	Day25:21.04.23	UNIT-2-LIMITS AND CONTINUITY(12p) f) Some standard form of limit vi) $\lim_{x \rightarrow 0} \frac{\log(1+x)}{x} = 1$
	Day26:22.04.23	UNIT-2-LIMITS AND CONTINUITY(12p) f) Some standard form of limit vii) $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$
6 th	Day27:24.04.23	Tutorial class : problems based on it
	Day28:25.04.23	UNIT-3 DERIVATIVES (21p) a) Derivative of a function at a point
	Day29:26.04.23	b) Algebra of derivative
	Day30:27.04.23	problems based on it
	Day31:28.04.23	c) Derivative of standard functions $x^n, a^x, \log_a x, e^x, \sin x, \cos x, \tan x, \cot x, \sec x, \csc x, \sin^{-1} x, \cos^{-1} x,$ $\tan^{-1} x, \cot^{-1} x, \sec^{-1} x, \csc^{-1} x$
	Day32:29.04.23	UNIT-3-DERIVATIVES (21p) d) Derivative of composite function (Chain Rule)
7 th	Day33:01.05.23	Tutorial class: problems based on it
	Day34:02.05.23	problems based on it
	Day35:03.05.23	e) Methods of differentiation
	Day36:04.05.23	problems based on it

	Day37:06.05.23	Exercise discussuion
8 th	Day38:08.05.23	Tutorial class
	Day39:09.05.23	Method of differentiation (continue) ii) Implicit function
	Day40:10.05.23	Problems based on it
	Day41:11.05.23	iii) Logarithmic function
	Day42:12.05.23	Problems based on it
	Day43:13.05.23	UNIT-3-DERIVATIVES (21p) iv) a function with respect to another function
9 th	Day44:15.05.23	Tutorial class
	Day45:16.05.23	f) Applications of Derivative: i) Successive Differentiation (up to second order)
	Day46:17.05.23	Problems based on it
	Day47:18.05.23	ii) Partial Differentiation (function of two variables up to second order)
	Day48:20.05.23	Problems based on it
10 th	Day49:22.05.23	Tutorial class: CLASS TEST-2
	Day49:23.05.23	UNIT-4 INTEGRATION (15p) Definition of integration as inverse of differentiation
	Day50:24.05.23	problems based on it
	Day51:25.05.23	b) Integrals of standard functions

	Day52:26.05.23	problems based on it
	Day53:27.05.23	UNIT-4 INTEGRATION (15p) Methods of integration i) Integration by substitution
11 TH	Day54:29.05.23	Tutorial class
	Day55:30.05.23	problems based on above.
	Day56:31.05.23	ii) Integration by parts
	Day57:01.06.23	problems based on it
	Day58:02.06.23	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) $\int \sqrt{x^2-a^2} dx$
	Day59:03.06.23	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 $f(x) = \text{odd}$ $= 2 \int_0^a f(x) dx$, if $f(x) = \text{even}$
12 TH	Day60:05.06.23	Tutorial class: problems based on it
	Day61:06.06.23	problem based on above
	Day62:07.06.23	Application of integration Area enclosed by a curve and X – axis ii) Area of a circle with centre at origin
	Day63:08.06.23	problem based on above.

	Day64:09.06.23	Unit 5 DIFFERENTIAL EQUATION (12p) a) Order and degree of a differential equation
	Day65:10.06.23	Unit 5 DIFFERENTIAL EQUATION (12p) b) Solution of differential equation
13 TH	Day66:12.06.23	Tutorial class:
	Day67:13.06.23	problems based on it
	Day68:16.06.23	i) 1st order and 1st degree equation by the method of separation of variables
	Day69:17.06.23	Important question discussion on above units
14 th	Day70:19.06.23	Tutorial class
	Day71:21.06.23	Unit 5 DIFFERENTIAL EQUATION (12p) ii) Linear equation $\frac{dy}{dx} + Py = Q$, where P,Q are functions of x
	Day72:22.06.23	problems based on it
	Day73:23.06.23	ii) Linear differential equation general form and its solution
	Day74:24.06.23	problems based on it
15 th	Day75:26.06.23	Tutorial class :CLASS TEST-3
	Day76:27.06.23	REVISION