

## Academic Lesson Plan for Engg. Mathematics-II (SUMMER-2024)

<b>Discipline:</b> Civil, Elect,A.A., ETC,Mech.,I.T.	<b>Semester:</b> 2nd	<b>Name of the teaching faculty:</b> Smt Smitarani Barik Miss Sushree Swadhinpriya Mohapatra Sri Niranjan Behera Sri Shibasish Mishra
<b>Subject:</b> Engg. Mathematics	<b>No. of days/per week</b> <b>Class Allotted:</b> 6	<b>Semester from:</b> 29/01/2024-14/05/2024
		<b>No. of weeks:</b> 16
<b>Week</b>	<b>Class day</b>	<b>Theory Topics</b>
1st	1st	Ch.1(a)Introduction of vector. Ch1(b).Types of vectors null vector, parallel vector
	2nd	Problems baesd on null vector, parallel vector
	3rd	Problems baesd on parallel vectors ,collinear vectors.
	4th	Ch.1(c).Representation of vector ,
	5th	ch.1(d). Magnitude and direction of vectors.
	6th	Problems based on Magnitude and direction of vectors
2nd	1st	Ch.1(e).Addition and subtraction of vector
	2nd	problems based on Addition and subtraction of vectors.
	3rd	Ch.1(f).Position vector
	4th	Ch.1(g).Explanation of Scalar. product of two vectors with examples .
	5th	Ch.1(h).Geometrical meaning of dot product. Ch.1(i).Angle between two vectors
	6th	Ch.1(j).Scalar and vector projection of two vectors. Explanation of Vector product with examples .
3rd	1st	Ch.1(k).geometrical meaning of vector product
	2nd	Area of triangle with examples .
	3rd	Area of parallelogram using with examples.
	4th	Doubt clear, previous year question discussion.
	5th	Class test based on vector.
4th	1st	Ch.2(a).Definition of function( based on set theory),
	2nd	ch.2(b).Types of functions i) Constant function
	3rd	ii) Identity function iii) Absolute value function

	4th	ch.2(b).Types of functions
	5th	greatest integer function, trigonometric function,
	6th	Quiz
5th	1st	Doubt clear on limit
	2 <sup>nd</sup>	exponential function logarithmic function
	3 <sup>rd</sup>	ch.2(d).Existence of limit (explanation with solving examples).
	4 <sup>th</sup>	Existence of limit (explanation with solving examples).
	5th	ch.2(e).Methods of evaluation of limit. $x^n - a^n = (x-a)(x^{n-1} + x^{n-2}a + \dots + a^{n-1})$
	6th	$a^x - 1 = x \ln a + o(x)$ $e^x - 1 = x + o(x)$ $\sin x = x - \frac{x^3}{6} + o(x^3)$ $\tan x = x + \frac{x^3}{3} + o(x^3)$ $\log(1+x) = x - \frac{x^2}{2} + o(x^2)$ $1 + \ln(1+x) = e^x + o(x)$ $(1+x)^x = e^{x \log(1+x)} = e^{x^2/2} + o(x^2)$
6th	1st	Doubt clear , previous year question discussion
	2nd	Class test based on limit and continuity.
	3rd	Ch.3(a). Introduction of Differentiation.
	4th	Derivative of a function at a point
7 <sup>th</sup>	1st	Discussion on above. Solve more examples
	2nd	Ch.3(b).algebra of derivative.
	3rd	Ch.3(c). Derivative of standard functions $x^n, a^x, e^x, \log$
	4th	Derivative of standard functions $\sin x, \cos x, \tan x, \cot x, \sec x, \operatorname{cosec} x$ .
	5th	Ch.3(a). Introduction of Differentiation.

	6th	Derivative of standard functions $\sin^{-1}x, \cos^{-1}x, \tan^{-1}x, \cot^{-1}x, \sec^{-1}x, \operatorname{cosec}^{-1}x$ .
8th	1st	Ch.3(d). Derivative of composite function (Chain Rule )
	2nd	Problems based on chain rule.
	3rd	Discussion on chain rule ,problem solving.
	4th	Ch.3(e)(i). Methods of differentiation of Parametric function.
	5th	Problem solving on above.
	6th	Ch.3(e)(ii). Methods of differentiation of Implicit function.
9th	1st	Discussion on parametric and implicit function
	2nd	Ch.3(e)(iii). Methods of differentiation of logarithmic function.
	3rd	Ch.3(e)(iv). Methods of differentiation of a function with respect to another function.
10th	1st	Ch.3(f)(i).Applications of Derivative . Ch.3(g).Problems based on above.
	2nd	Successive Differentiation (up to second order)
	3rd	Ch.3(f)(ii).Partial Differentiation (function of two variables up to second order).
	4th	Ch.3(g).Problems based on above
	5th	Ch.3(g).Problems based on above
11th	1st	Doubt clear class .Previous year question discussion .
	2nd	Class test based on derivatives
	3rd	Ch.4(a).Definition of integration as inverse of differentiation.
	4th	Ch.4(b).Integrals of standard functions.
	5th	Ch.4(c)(i).Integration by substitution. Integration by substitution.
12th	1st	Ch.4(c)(ii).Integration by parts method.
	2nd	Integration by parts method.
	3rd	Integration of parametric function
	4th	Integration of explicit function
	5th	Integration of a function w.r.t. another function.
13th	1st	Integration by logarithm.
	2nd	Integration of series function.
	3rd	Integration by partial fraction.

	4th	Ch.4(e)Definite integral, properties of definite integrals
	5 <sup>th</sup>	Definite integral, properties of definite integrals.
	6th	Ch.4(f).Application of integration ( Area enclosed by a curve and X – axis).
14th	1st	Application of integration (Area of a circle with centre at origin).
	2nd	Doubt clearing class on integration. Previous year question discussion
	3rd	Ch.5 (a).Introduction to differential equation, order and degree of differential equation.
	4 <sup>th</sup>	Examples to find the order and degree of a given differential equation.
	5 <sup>th</sup>	Solution of 1 <sup>st</sup> order and 1 <sup>st</sup> degree equation by the method of separation of variables.
	6th	Linear differential equation. Method of separable variable Euler test.
15th	1st	Ch.5(b).Solution of 1 <sup>st</sup> order and 1 <sup>st</sup> degree equation by the method of separation of variable.
	2nd	Ch.5(b)(i).Solution of 1 <sup>st</sup> order and 1 <sup>st</sup> degree equation by the method of separation of variables.
	3 <sup>rd</sup>	More examples on the above topic
	4 <sup>th</sup>	Ch.5(b)(ii).Solution of Linear equation $dy/dx+py =q$ where P,Q are functions of x.
	5th	Solution of Linear equation, $dy/dx+ py =q$ where P,Q are functions of x.
	6th	Discussion on the above chapter and problem solving.
	1 <sup>st</sup>	Doubt clearing class. Previous year question discussion
16th	2 <sup>nd</sup>	Class test based on differential equation.

*Shiba-Sish Mishra*

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Signature of Faculty


11th		


Sasmita Moharana Madhusmita Sahoo