## 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 |
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| 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 |
| 1st | 1st | Introduction to scalars and vectors, different types of vector |
|  | 2nd | Operations on vectors (addition, subtraction and multiplication of a vector by a scalar) |
|  | 3 rd | 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 |
| 2nd | 1st | Product of vectors, Scalar or doproduc of two vectors, geometrical meaning of scalar product, properties of scalar profuct |
|  | 2nd | Illustrative examples, components of vector along and perpendicular to a vector |
|  | 3rd | Illustrative examples exacise problem discussion |
|  | 4th | Angle betweentyo vectors, scalar and vector projection of two vectors |
|  | 5th | ILustratiee examples, exercise problem discussion |
| 3rd | 1st | Vector product (Cross product) of vectors, geometrical meaning and properties. |
|  | 2nd | Vector product of orthonormal triads of unit vectors, illustrative examples |
|  | 3rd | Area of triangle and parellologram, illustrative examples |
|  | 4th | Problems discussion and doubt clearing |
|  | 5th | Exercise problem discussion |
| 4th | 1st | Definition of function, domain and range of a function, types of function |
|  | 2nd | Constant function, Identity function, absolute value function |
|  | 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 |


| 5th | 1st | Illustrative examples, methods o |
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|  | 2nd | Direct substitution method, factorization illustrative examples |
|  | 3rd | examples and problem discussion |
|  | 4th | Standard identities:- $\text { (i) } \frac{x^{n}-a^{n}}{x-a} \text {, (ii) } \frac{a^{x}-1}{x} \text { as } x \rightarrow 0$ <br> Illustrative examples |
|  | 5th | Limit of $\frac{e^{x}-1}{x}$ as $x \rightarrow 0$ and $\ln (1+x)$ as $x \rightarrow 0$ <br> Illustrative examples |
| 6th | 1 st | (i) $\quad \lim _{n \rightarrow \infty}\left(1+\frac{1}{n}\right)^{n}=e$ <br> (ii) $\quad \lim _{n \rightarrow x}(1+n)^{\frac{1}{n}}=e$ <br> Illustrative examples |
|  | 2nd | $\text { Limit of } \frac{\sin x}{x}, \frac{\tan x}{x} \text { as } x \rightarrow 0$ <br> Illustrative examples |
|  | 3rd | Definition of continuity of frection a point and problem based on it |
|  | 4th | Illustrative examples basedran continuity |
|  | 5th | Problem disefission and doubt clearing |
| 7th | 1st | Intrgencting to differential calculus, derivative of a function at a point |
|  | 2nd | ANebra of differentiation |
|  |  | $\begin{gathered} x^{n}, a^{x}, \ln (x), e^{x}, \sin (x), \cos (x), \tan (x), \cot (x), \sec (x), \operatorname{cosec}(x), \\ \sin ^{-1} \mathrm{x}, \cos ^{-1} \mathrm{x}, \tan ^{-1} \mathrm{x}, \cot ^{-1} \mathrm{x}, \sec ^{-1} \mathrm{x}, \operatorname{cosec}^{-1} \mathrm{x} \end{gathered}$ |
|  | 4th | Continue |
|  | 5th | Continue |
| 8th | 1st | Continue |
|  | 2nd | Continue |
|  | 3rd | Derivative of a composite function, illustrative examples |
|  | 4th | Continue, problem discussion |
|  | 5th | Derivative of inverse trigonometric function |
|  | 1st | Continue |


| 9th | 2nd | Differentiation by trigonometric transiormation |
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|  | 3 rd | Continue |
|  | 4th | Differentiability |
|  | 5th | Relation between differentiability and continuity |
| 10th | 1st | Derivative of parametric function, illustrative examples |
|  | 2nd | Derivative of implicit function, illustrative examples |
|  | 3 rd | Derivative of function w.r.t another function, illustrative examples |
|  | 4th | Logarithmic differentiation, illustrative examples |
|  | 5th | Continue |
| 11th | 1st | Problem discussion |
|  | 2nd | Successive differentiation, illustratreey amples |
|  | 3rd | Partial differentiation |
|  | 4th | Continue |
|  | 5th | Problem |
| 12th | 1st | Detiontion sf integration as inverse of differentiation |
|  | 2nd | Sarmestandard formulae of integration with examples |
|  | 3rd | General properties of integration, illustrative examples |
|  | 4th | Methods of integration, <br> (i) Substitution <br> 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 <br> (i) $\int \frac{d x}{x^{2}+a^{2}}$, <br> (ii) $\int \frac{d x}{x^{2}-a^{2}}$. <br> (iii) $\int \frac{d x}{a^{2}-x^{2}}$ <br> illustrative examples |




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