

## LESSON PLAN OF APPL. MATH.-II FOR THE ACADEMIC SESSION: 2024-25 (SUM-2025)

|                        |                       |                                      |                                                                                                               |                                                                                                        |                  |
|------------------------|-----------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------|
| Discipline : COMMON    |                       |                                      | Semester :<br>2 <sup>ND</sup>                                                                                 | Name of the Teaching Faculty : Smita Rani Barik,lect.math.<br>Niranjan Behera,PTGF Math)<br><br>THEORY |                  |
| Subject : APPL.MATH-II |                       |                                      | From date: 04/02/2025 to 17/05/2025<br>No.of weeks:-15(excluding holidays)                                    |                                                                                                        |                  |
| WEEK                   | No.of<br>classes/week | CHAPTER                              | THEORY                                                                                                        |                                                                                                        | NO.OF<br>PERIODS |
| 1ST                    | 1ST                   | Determinants<br>& Matrices<br>UNIT-I | Definition of Matrix, Types of Matrices, Orthogonal Matrix, Symmetric and Skew symmetric Matrix               |                                                                                                        | 1                |
|                        | 2ND                   |                                      | Continue Determinant of square matrix, Singular and Non-singular Matrix.                                      |                                                                                                        | 1                |
|                        | 3RD                   |                                      | Algebra of Matrices(Addition, subtraction, multiplication) and properties, Transpose of Matrix and properties |                                                                                                        | 1                |
|                        | 4TH                   |                                      | Continue                                                                                                      |                                                                                                        | 1                |
| 2ND                    | 1ST                   |                                      | Minors, Cofactors, Adjoint of a square Matrix                                                                 |                                                                                                        | 1                |
|                        | 2ND                   |                                      | Inverse of a square Matrix , Illustrative examples                                                            |                                                                                                        | 1                |
|                        | 3RD                   |                                      | Matrix method, Illustrative examples.                                                                         |                                                                                                        | 1                |
|                        | 4TH                   |                                      | Problem discussion                                                                                            |                                                                                                        | 1                |
| 3RD                    | 1ST                   |                                      | Introduction to Determinant, Properties of Determinant , Illustrative examples                                |                                                                                                        | 1                |
|                        | 2ND                   |                                      | Continue                                                                                                      |                                                                                                        | 1                |
|                        | 3RD                   |                                      | Cramer’s Rule, Illustrative examples                                                                          |                                                                                                        | 1                |
|                        | 4TH                   |                                      | Problem Discussion                                                                                            |                                                                                                        | 1                |
| 4 <sup>TH</sup>        | 1ST                   |                                      | Problem Discussion                                                                                            |                                                                                                        | 1                |
|                        | 2ND                   |                                      | Problem Discussion                                                                                            |                                                                                                        | 1                |

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|     | 3RD |                                  | Consistency of equations, Illustrative examples                                                                                                                       | 1 |
|     | 4TH |                                  | Problem Discussion                                                                                                                                                    | 1 |
| 5TH | 1ST | Integral Calculus<br>UNIT-II     | Integration as inverse operation of differentiation, formulae illustrative examples.                                                                                  | 1 |
|     | 2ND |                                  | Simple integration by substitution, Illustrative examples                                                                                                             | 1 |
|     | 3RD |                                  | Integration By- Parts, Illustrative examples                                                                                                                          | 1 |
|     | 4TH |                                  | Integration by partial fractions, Illustrative examples.                                                                                                              | 1 |
| 6TH | 1ST |                                  | Definite Integration, Properties of Definite Integration, Illustrative examples.                                                                                      | 1 |
|     | 2ND |                                  | Use of Walli's Integral Formula, Illustrative examples                                                                                                                | 1 |
|     | 3RD |                                  | Area bounded by coordinate axes, illustrative examples                                                                                                                | 1 |
|     | 4TH |                                  | Area enclosed by circle, ellipse illustrative examples                                                                                                                | 1 |
| 7TH | 1ST |                                  | Calculation of volume of a solid formed by revolution of an area about axes                                                                                           | 1 |
|     | 2ND |                                  | Continue                                                                                                                                                              | 1 |
|     | 3RD |                                  | Continue                                                                                                                                                              | 1 |
|     | 4TH |                                  | Exercise Problem discussion                                                                                                                                           | 1 |
| 8TH | 1ST | Co-Ordinate Geometry<br>UNIT-III | Concept of Co-ordinate Geometry, Cartesian Co-Ordinate System, Straight Lines, Vertical Line, Horizontal line, perpendicular lines, Parallel Lines, Coincident Lines. | 1 |
|     | 2ND |                                  | Slope of Lines, Equation Straight Line in Various Standard Forms, Illustrative examples                                                                               | 1 |
|     | 3RD |                                  | Perpendicular distance of a point from a line, Distance between two parallel lines, Illustrative examples.                                                            | 1 |
|     | 4TH |                                  | Concept of Circle, General equation of circle, Equation of a circle through three given points                                                                        | 1 |

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| 9TH  | 1ST |                                  | Continue, Illustrative examples                                                                                                              | 1 |
|      | 2ND |                                  | Conic Sections, General Equation of Conic                                                                                                    | 1 |
|      | 3RD |                                  | Parabola, Standard Equation of parabola, vertex, Focus, Directrix, eccentricity and some important terms.                                    | 1 |
|      | 4TH |                                  | Hyperbola, Foci, Directrices, eccentricity, Illustrative examples                                                                            | 1 |
| 10TH | 1ST | Co-Ordinate Geometry<br>UNIT-III | Hyperbola, Foci, Directrices, eccentricity, Illustrative examples                                                                            | 1 |
|      | 2ND |                                  | Ellipse, standard equation, vertices, directrices, major axis, minor axis, principal axes, centre, latus rectum , focal radii, eccentricity. | 1 |
|      | 3RD |                                  | Continue,                                                                                                                                    | 1 |
|      | 4TH |                                  | Problem discussion                                                                                                                           | 1 |
| 11TH | 1ST | Vector Algebra<br>UNIT-IV        | Introduction Vectors, representation of vectors, Rectangular Resolution of a vector                                                          | 1 |
|      | 2ND |                                  | Algebra of vectors, Addition of two vectors, Triangle law of addition of vectors, parallelogram law of addition of vectors                   | 1 |
|      | 3RD |                                  | Properties of vector addition, Multiplication of a vector by a scalar, Subtraction of vectors, Illustrative examples                         | 1 |
|      | 4TH |                                  | Types of vectors, Illustrative examples                                                                                                      | 1 |
| 12TH | 1ST |                                  | Dot product or scalar product of non-zero vectors, cos angle between two vectors, Application of dot product(work), Illustrative examples    | 1 |
|      | 2ND |                                  | Problem Discussion                                                                                                                           | 1 |
|      | 3RD |                                  | Cross product or vector product of two vectors, properties of cross product, sine angle between two                                          | 1 |

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|      |     |                                  | vectors                                                                                                             |   |
|      | 4TH |                                  | Continue                                                                                                            | 1 |
| 13TH | 1ST |                                  | Problem Discussion                                                                                                  | 1 |
|      | 2ND |                                  | Application of Vector Product(Moment of force), Torque, Angular velocity, Illustrative examples                     | 1 |
|      | 3RD |                                  | Problem Discussion                                                                                                  | 1 |
|      | 4TH |                                  | Problem Discussion                                                                                                  | 1 |
| 14TH | 1ST | Differential Equations<br>UNIT-V | Introduction to Differential Equation, ODE, PDE, Illustrative examples                                              | 1 |
|      | 2ND |                                  | Order and Degree of Differential equation, Illustrative examples, solution of ordinary differential equation        | 1 |
|      | 3RD |                                  | Formation of Differential Equation whose general solution is given, Illustrative examples                           | 1 |
|      | 4TH |                                  | Solution of First order and First degree Differential Equation by Variable Separation Method, Illustrative Examples | 1 |
| 15TH | 1ST |                                  | Problem Discussion                                                                                                  | 1 |
|      | 2ND |                                  | MATLAB-An introduction, Salient Features                                                                            | 1 |
|      | 3RD |                                  | Basics Of MATLAB, advantages and disadvantages of MATLAB                                                            | 1 |
|      | 4TH |                                  | Application of Differential Equations and MATLAB                                                                    | 1 |

**Mrs.Smita rani barik,Lect.Math**

**Mr. Niranjan Behera,PTGF**

**SIGNATURE OF FACULTY**

## LESSON PLAN OF APPL. MATH.-I FOR THE ACADEMIC SESSION: 2024-25 (WIN-2024)

| Discipline : COMMON    |                        |                        | Semester :<br>1ST                                                                           | Name of the Teaching Faculty : Tanuja dash, HoD Math<br>Smita Rani Barik, lect.math.<br>Niranjana behera<br><br>THEORY |
|------------------------|------------------------|------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Subject : APPL.MATH-II |                        |                        | From date: 16/08/2024 to 14/12/2024<br>No. of weeks:-15(excluding holidays)                 |                                                                                                                        |
| WEEK                   | No. of<br>classes/week |                        | THEORY                                                                                      | NO. OF<br>PERIODS                                                                                                      |
| 1ST                    | 1ST                    | TRIGONOMETRY<br>UNIT-1 | Concept of angles(FUNDAMENTAL)                                                              | 1                                                                                                                      |
|                        | 2ND                    |                        | Examples on above                                                                           | 1                                                                                                                      |
|                        | 3RD                    |                        | Degree measurement of angles in grades and radians and their conversions                    | 1                                                                                                                      |
|                        | 4TH                    |                        | Examples on above                                                                           | 1                                                                                                                      |
| 2ND                    | 1ST                    |                        | T-Ratios of Allied angles (without proof),                                                  | 1                                                                                                                      |
|                        | 2ND                    |                        | T-Ratios of Allied angles (without proof), problem discussion                               | 1                                                                                                                      |
|                        | 3RD                    |                        | degrees Sum, difference formulae and their applications (without proof)                     | 1                                                                                                                      |
|                        | 4TH                    |                        | degrees Sum, difference formulae and their applications (without proof), problem discussion | 1                                                                                                                      |
| 3RD                    | 1ST                    |                        | Examples on above                                                                           | 1                                                                                                                      |
|                        | 2ND                    |                        | Examples on above                                                                           | 1                                                                                                                      |
|                        | 3RD                    |                        | Product formulae                                                                            | 1                                                                                                                      |
|                        | 4TH                    |                        | Product formulae, problem discussion                                                        | 1                                                                                                                      |

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|-----------------|-----|--------------------------------------------------|----------------------------------------------------------------------|---|
| 4 <sup>TH</sup> | 1ST |                                                  | (Transformation of product to sum, difference and vice versa).       | 1 |
|                 | 2ND |                                                  | (Transformation of product to sum, difference and vice versa).       | 1 |
|                 | 3RD |                                                  | T- Ratios of multiple angles, sub-multiple angles (2A, 3A, A/2).     | 1 |
|                 | 4TH |                                                  | <b>Examples on above</b>                                             | 1 |
| 5TH             | 1ST | <b>UNIT-1</b>                                    | <b>Examples on above</b>                                             | 1 |
|                 | 2ND |                                                  | Graphs of $\sin x$ , $\cos x$ , $\tan x$ and $e^x$ .                 | 1 |
|                 | 3RD |                                                  | Discussion on above chapter                                          | 1 |
|                 | 4TH |                                                  | <b>CLASS TEST</b>                                                    | 1 |
| 6TH             | 1ST | <b>DIFFERENTIAL<br/>CALCULUS<br/><br/>UNIT-2</b> | Definition of function, problem discusson                            | 1 |
|                 | 2ND |                                                  | Definition of function ,problem discusson                            | 1 |
|                 | 3RD |                                                  | Concept of limits, problem discusson                                 | 1 |
|                 | 4TH |                                                  | Concept of limits, problem discusson                                 | 1 |
| 7TH             | 1ST |                                                  | Four standard limits, problem discusson                              | 1 |
|                 | 2ND |                                                  | Four standard limits ,problem discusson                              | 1 |
|                 | 3RD |                                                  | <b>Examples on above</b>                                             | 1 |
|                 | 4TH |                                                  | <b>Examples on above</b>                                             | 1 |
| 8TH             | 1ST |                                                  | Differentiation by definition                                        | 1 |
|                 | 2ND |                                                  | <b>Examples on above</b>                                             | 1 |
|                 | 3RD |                                                  | Differentiation of sum, product and quotient of functions.           | 1 |
|                 | 4TH |                                                  | <b>Examples on above</b>                                             | 1 |
| 9TH             | 1ST |                                                  | Differentiation of function of a function.                           | 1 |
|                 | 2ND |                                                  | <b>Examples on above</b>                                             | 1 |
|                 | 3RD |                                                  | Differentiation of trigonometric and inverse trigonometric functions | 1 |

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|      | 4TH |                   | Examples on above                                                                                                                                                                                                                                                                                                              | 1 |
| 10TH | 1ST |                   | .Logarithmic differentiation, Exponential functions.                                                                                                                                                                                                                                                                           | 1 |
|      | 2ND |                   | Examples on above                                                                                                                                                                                                                                                                                                              | 1 |
|      | 3RD |                   | Discussion of unit-II and doubt clearing class                                                                                                                                                                                                                                                                                 | 1 |
|      | 4TH |                   | Class test                                                                                                                                                                                                                                                                                                                     | 1 |
| 11TH | 1ST |                   | Complex Numbers: Definition, real and imaginary parts of a Complex number, polar and Cartesian, representation of a complex number and its conversion from one form to other                                                                                                                                                   | 1 |
|      | 2ND |                   | conjugate of a complex number, modulus and amplitude of a complex number Addition, Subtraction, Multiplication and Division of a complex number.                                                                                                                                                                               | 1 |
|      | 3RD |                   | De-moivre's theorem, its application.                                                                                                                                                                                                                                                                                          | 1 |
|      | 4TH |                   | Examples on above                                                                                                                                                                                                                                                                                                              | 1 |
| 12TH | 1ST | ALGEBRA<br>UNIT-3 | Definition of polynomial fraction proper & improper fractions and definition of partial fractions. To resolve proper fraction into partial fraction with denominator containing non-repeated linear factors, repeated linear factors and irreducible non-repeated quadratic factors. To resolve improper fraction into partial | 1 |
|      | 2ND |                   | Examples on above                                                                                                                                                                                                                                                                                                              | 1 |
|      | 3RD |                   | Examples on above                                                                                                                                                                                                                                                                                                              | 1 |
|      | 4TH |                   | Examples on above                                                                                                                                                                                                                                                                                                              | 1 |
| 13TH | 1ST |                   | Value of $nPr$ and $nCr$                                                                                                                                                                                                                                                                                                       | 1 |
|      | 2ND |                   | Examples on above                                                                                                                                                                                                                                                                                                              | 1 |
|      | 3RD |                   | . Binomial theorem: Binomial theorem (without proof) for positive integral index (expansion and                                                                                                                                                                                                                                | 1 |

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|      |     |               | general form); binomial theorem for any index (expansion without proof)           |   |
|      | 4TH |               | <b>Examples on above</b>                                                          | 1 |
| 14TH | 1ST |               | <b>Examples on above</b>                                                          | 1 |
|      | 2ND |               | first and second binomial approximation with applications to engineering problems | 1 |
|      | 3RD |               | <b>Examples on above</b>                                                          | 1 |
|      | 4TH |               | <b>Examples on above</b>                                                          | 1 |
| 15TH | 1ST | <b>UNIT-1</b> | <b>DOUBT CLEARING CLASS,Previous year question discussion</b>                     | 1 |
|      | 2ND | <b>UNIT-2</b> | <b>DOUBT CLEARING CLASS,Previous year question discussion</b>                     | 1 |
|      | 3RD | <b>UNIT-3</b> | <b>DOUBT CLEARING CLASS,Previous year question discussion</b>                     | 1 |
|      | 4TH |               | <b>Mock test</b>                                                                  | 1 |

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