CURRICULAM PLAN OF Dr. VARSHA

FOR EVEN SEMESTER 2024-25

B.Sc. (H) PHYSICS (IST YEAR)

PAPER- DSC- Mathematical Physics-II (2222011201)

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| CONTENT | ALLOCATION OF LECTURES | SCHEDULE FOLLOWED |
| **Orthogonal Curvilinear Coordinates:** Orthogonal Curvilinear Coordinates. Scale factors,  element of area and volume in spherical and cylindrical coordinate Systems. Derivation of  Gradient, Divergence, Curl and Laplacian in Spherical and Cylindrical Coordinate Systems  **Fourier Series:** Periodic functions, Orthogonality of sine and cosine functions, Convergence of  Fourier series and Dirichlet Conditions (Statement only), Expansion of periodic functions in a  series of sine and cosine functions and determination of Fourier coefficients, Even and odd  functions and their Fourier expansions (Fourier Cosine Series and Fourier Sine Series),  Parseval's Identity. | (13 Lectures) | 27th JAN and 1-28 FEB, 1st week of March  Derivations and Numericals |
| Frobenius Method and series solution of Differential Equations: Singular Points of Second Order Linear Differential Equations and their importance, Frobenius method for finding series solution and its applications, Legendre Differential Equations and its solution. Properties of Legendre Polynomials: Rodrigues Formula, Generating Function, Orthogonality of Legendre Polynomials, Simple recurrence relations, Expansion of function in a series of Legendre Polynomials. Some Special Integrals: Beta and Gamma Functions and relation between them, Expression of Integrals in terms of Gamma and Beta Functions. | (17 Lectures) | 2nd week of March, April to 25th May  Derivations and  Numericals  Class test on unit end  Discussion of  Important questions |