**Depatment of Mathematics**

**Lecture Plan (Engg. Maths-II KAS-203)**

**w.e.f. 16-01-2020**

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| **Unit** | **Course Topics** | **No. of Lectures** |
| **Module – I: Ordinary Differential Equation** | Solution of linear differential equation of n’th order with constant coefficients  Simultaneous linear differential equation  Solution of second order linear differential equation with variable coefficients: Reduction of order, Normal form and By changing independent variable  Method of variation of parameters  Cauchy-Euler equation  Series solutions (Frobenius Method) | **2**  **2**  **3**  **2**  **2**  **2** |
| **Module – II: Multivariable Calculus** | Improper Integrals  Beta and Gamma functions and their properties  Dirichlet’s integral and its applications  Application of definite integrals to evaluate surface areas and volume of revolutions | **3**  **3**  **3**    **3** |
| **Module– III: Sequences and Series** | Definitions of sequences and series with examples  Convergence of sequence and series  Tests for convergence of series : Ratio test, D’Alembert test and Rabbe’s test  Fourier series  Fourier half-range Sine and Cosine series | **2**  **2**  **3**  **3**  **2** |
| **Module – IV: Complex Variable (Differentiation)** | Limit, Continuity and Differentiability  Functions of complex variable, Analytic function  Cauchy-Riemann equations (Cartesian and Polar forms)  Harmonic function  Method to find Analytic functions  Conformal mapping, Mobius transformation and their properties | **2**  **2**  **2**  **2**  **2**  **3** |
| **Module – V:**  **Complex Variable (Integration)** | Complex integrals and Contour integrals  Cauchy-Goursat theoremand Cauchy integral formula  Taylor’s series, Laurent’s series and Liouvilles’s theorem  Singularities, Classification of singularities  Zeros of analytic functions, Residues  Method of finding residues, Cauchy Residue theorem  Evaluation of real integrals of the type | **2**  **2**  **2**  **1**  **1**  **2**  **3** |
|  | Total | **72** |