**Curriculum Plan (EVEN SEM 2024): B. Sc. (H) Mathematics III Year (Semester VI)**

**Paper: Complex Analysis**

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| **Dr. Tajender Kumar**  Assistant Professor  Department of Mathematics  Kalindi College (University of Delhi)  Delhi- 110008  Mobile: +91 7417837644  **E- mail**: [tajenderkumar@kalindi.du.ac.in](mailto:tajenderkumar@kalindi.du.ac.in) | |  | **Marks Distribution** | **Theory** | 75 Marks | |
| **Practical** | 50 Marks | |
| **Internal Assessment** | Assignments 10 Marks | |
| Home Exams/ 10 Marks  Class Test | |
| Attendance 5 Marks | |
| **Classes Assigned** | **Lectures** | 4 per week (**Theory**) | |
| **Lab** | 4 per week | |
| **References** |  | 1. Brown, James Ward, & Churchill, Ruel V. (2014). Complex Variables and Applications (9th ed.). McGraw-Hill Education. New York. | | | | |
|  | **Beginning/1st week with 3 days**  18th Jan. - 27th Jan. | **Topics**  Functions of complex variable, Mappings, Mappings by the exponential function.  [1] Chapter 2 (Sections 12 to 14). | | | |  |
|  | **2nd week**  29th Jan. – 03rd Feb | Limits, Theorems on limits, Limits involving the point at infinity, Continuity.  [1] Chapter 2 (Sections 15 to 18). | | | |  |
|  | **3rd week**  05th Feb. – 10th Feb. | Derivatives, Differentiation formulae, Cauchy-Riemann equations, Sufficient conditions for  differentiability.  [1] Chapter 2 (Sections 19 to 22). | | | |  |
|  | **4th week**  12th Feb. - 17th Feb. | Analytic functions, Examples of analytic functions, Exponential function.  [1] Chapter 2 (Sections 24 and 25) and Chapter 3 (Section 29). | | | |  |
|  | **5th week**  19th Feb.- 24th Feb. | Logarithmic function, Branches and Derivatives of Logarithms, Trigonometric functions.  [1] Chapter 3 (Sections 30, 31 and 34). | | | |  |
|  | **6th week**  26th Feb. – 02nd Mar. | Derivatives of functions, Definite integrals of functions, Contours.  [1] Chapter 4 (Sections 37 to 39). | | | |  |
|  | **7th week**  04thMar. **–** 09th Mar. | Contour integrals and its examples, upper bounds for moduli of contour integrals.  [1] Chapter 4 (Sections 40, 41 and 43). | | | |  |
|  | **8th week**  11th Mar. – 16th Mar. | Antiderivatives, proof of antiderivative theorem.  [1] Chapter 4 (Sections 44 and 45). | | | |  |
|  | **9th week**  18th Mar.– 23rd Mar. | State Cauchy−Goursat theorem, Cauchy integral formula.  [1] Chapter 4 (Sections 46 and 50). | | | |  |
|  | **10th week**  01st Apr. – 06th Apr. | An extension of Cauchy integral formula, Consequences of Cauchy integral formula,  Liouville’s theorem and the fundamental theorem of algebra.  [1] Chapter 4 (Sections 51 to 53). | | | |  |
|  | **11th week**  08th Apr. – 13th Apr. | Convergence of sequences, Convergence of series, Taylor series, proof of Taylor’s  theorem, Examples.  [1] Chapter 5 (Sections 55 to 59). | | | |  |
|  | **12th week**  15th Apr. – 20th Apr. | Laurent series and its examples, Absolute and uniform convergence of power series,  uniqueness of series representations of power series.  [1] Chapter 5 (Sections 60, 62, 63 and 66). | | | |  |
|  | **13th week**  22nd Apr. – 27th Apr. | Laurent series and its examples, Absolute and uniform convergence of power series,  uniqueness of series representations of power series.  [1] Chapter 5 (Sections 60, 62, 63 and 66). | | | |  |
|  | **14th week**  29th Apr. – 04th May. | Isolated singular points, Residues, Cauchy’s residue theorem, Residue at infinity.  Chapter 6 (Sections 68 to 71). | | | |  |
|  | **15th week**  06th May. – 11th May. | Types of isolated singular points, Residues at poles and its examples.  [1] Chapter 6 (Sections 72 to 74). | | | |  |
| Dispersal of classes, preparation leave and practical examination begin- 12 May, 2024. | | | | | | |