**Curriculum Plan : B.Sc. Physical Sciences I Year (I Sem)**

**Topics in Calculus**

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| **Ms. Garima Gaur**  Assistant Professor  Department of Mathematics  Kalindi College (University of Delhi)  Delhi- 110008  Mobile: 9953227989  E- mail: garimagaur@kalindi.du.ac.in | |  | **Marks Distribution** | **Theory** | 90 Marks | |
| **Internal Assessment** | 30 Marks | |
| **Continuous Assessment** | 40 Marks | |
| **Classes Assigned** | **Theory** | 3 lectures per week | |
|  | **References** | 1. **Prasad, Gorakh (2016). Differential Calculus (19th ed.). Pothishala Pvt. Ltd. Allahabad.** 2. **Prasad, Gorakh (2015). Integral Calculus. Pothishala Pvt. Ltd. Allahabad.** | | | | |
|  | **Week** | **Topics** | | | |  |
|  | **1st week** | Limit of a function, definition of a limit, Infinite limits. | | | |  |
| **2nd week** | Continuity and types of discontinuities | | | |
|  | **3rd week** | Differentiability of a function, Successive differentiation. | | | |  |
| **4th week** | Calculation of the nth derivatives, Leibnitz theorem. | | | |  |
| **5th week** | Partial differentiation, Euler’s theorem on homogeneous functions. | | | |  |
|  | **6th week** | Rolle’s theorem, Mean value theorems. | | | |  |
|  | **7th week** | Applications to monotonic functions and inequalities. | | | |  |
|  | **8th week** | Taylor’s theorem with Lagrange’s and Cauchy’s form of remainders, Definition and examples of convergent sequences and series. | | | |  |
|  | **9th week** | Taylor’s, Maclaurin’s series expansions of , sinx , cosx , log(1+x), e^x, and (1+x)^m. | | | |  |
|  | **10th week** | Indeterminate forms. | | | |  |
|  | **11th week** | Asymptotes (parallel to axes and oblique). | | | |  |
|  |  | **SEMESTER BREAK** | | | |  |
|  | **12th week** | Concavity and inflexion points, Singular points (cusp, node and conjugate). | | | |  |
|  | **13th week** | Tangents at the origin and nature of singular points, Curve tracing (cartesian and polar equations). | | | |  |
|  | **14th week** | Reduction formulae | | | |  |
|  | **15th week** | Application of Reduction Formulae. | | | |  |