**Curriculum Plan: B.Sc. Physical Science, I Year (Semester II)**

**Calculus & Geometry**

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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** | 75 Marks | |
| **Internal Assessment** | 25 Marks | |
| **Classes Assigned** | **Lectures** | 5 per week | |
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| **Practical** |  | |
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| **References** |  | **1. Anton, Howard, Bivens, Irl, & Davis, Stephen (2013). Calculus (10th ed.). John Wiley & Sons Singapore Pvt. Ltd. Reprint (2016) by Wiley India Pvt. Ltd. Delhi.**  **2. Strauss, M. J., Bradley, G. L., & Smith, K. J. (2007). Calculus (3rd ed.). Dorling Kindersley (India) Pvt. Ltd. (Pearson Education). Delhi. Sixth impression 2011.** | | | | |
|  | **Week** | **Topics** | | | |  |
|  | **Beginning day /1st week**  April 7- 14, 2022 | The first derivative test for relative extrema, Concavity and inflection points. | | | |  |
| **2nd week**  April 15-21, 2022 | Second derivative test for relative extrema, Curve sketching using first and second derivative tests. | | | |
|  | **3rd week**  April 22-28, 2022 | Limits to infinity and infinite limits, Graphs with asymptotes. | | | |  |
| **4th week**  April 29-May 5, 2022 | Vertical tangents and cusps, L'Hôpital's rule. | | | |  |
| **5th week**  May 6-12, 2022 | Parametric representation of curves and tracing of parametric curves (except lines in ℝ). | | | |  |
|  | **6th week**  May 13-19, 2022 | Polar coordinates and the relationship between Cartesian and polar coordinates. | | | |  |
|  | **7th week**  May 20-26, 2022 | Tracing of curves in polar coordinates. | | | |  |
|  | **8th week**  May 21-26,2022 | Volumes by slicing disks and method of washers. Volumes by cylindrical shells, | | | |  |
|  | **9th week**  May 27- June 2, 2022 | Arc length, Arc length of parametric curves. | | | |  |
|  | **10th week**  June 3-9, 2022 | Area of surface of revolution. | | | |  |
|  | **11th week**  June 10- 16, 2022 | Reduction formulae, and to obtain the iterative formulae for some particular integrals. | | | |  |
|  | **12th week**  June 17-23, 2022 | Techniques of sketching conics: parabola, ellipse and hyperbola. | | | |  |
|  | **13th week**  June 24-30, 2022 | Reflection properties of conics, Rotation of axes, second degree equations and their classification into conics using the discriminant. | | | |  |
|  | **14th week**  July 1-7, 2022 | Vector-valued functions, Differentiation of vector-valued functions, gradients, divergence, curl and their geometrical interpretation. | | | |  |
|  | **15th week**  June 8-14, 2022 | Spheres, Cylindrical surfaces. Illustrations of graphing standard quadric surfaces like cone, ellipsoid. | | | |  |
|  | **16th week**  July 15-25 , 2022 | Spheres, Cylindrical surfaces. Illustrations of graphing standard quadric surfaces like cone, ellipsoid. | | | |  |