

**Lalit Narayan Mithila University, Darbhanga**  
Multidisciplinary Course (MDC)  
Mathematics for All Streams (Semester-II)

### Course Details

Course Code: MDC-02

Title: Calculus & Geometry

Credits: 3 (Lecture: 30)

Objective: To introduce the basic tools of calculus and geometric properties of different conic sections which are helpful in their applications in planetary motion, design of telescope and to real-world problems.

### Course Structure

#### Unit 1: Basics of Differential Calculus

(10 Lectures)

- Successive differentiation & Leibnitz's theorem (without proof)
- Maclaurin's & Taylor's series of expansion
- Partial differentiation & Euler's theorem
- Total differential

#### Unit 2: Basics of Integral Calculus

(10 Lectures)

- Evaluation of definite integrals
- Reduction formulae
- Length of plane curve
- Area bounded by plane curves

#### Unit 3: Geometrical Properties of Conic Section

(10 Lectures)

- Transformation of rectangular axes
- General equations of conics
- Normal form of conics
- Equations of the tangents and normal at a point of the Conic

### Evaluation

Internal Assessment: 30 Marks

End-Semester Examination: 70 Marks

### References

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1. Anton, Howard, Bivens, Irl, & Davis, Stephen (2013), Calculus (10<sup>th</sup> ed.). John Wiley & Sons, Singapore Pte. Ltd. Indian Reprint (2016) by Wiley India Pvt.Ltd. Delhi.
2. Osborne, George, A. (1906). Differential & Integral Calculus with Examples and Applications Revised Edition. D.C. Heath & Co. publishers. Boston, U.S.A.
3. Lalji Prasad, Integral Calculus, Paramount Publications Patna.
4. S.L. Loney, Coordinate Geometry.

**Syllabus Committee**

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