

# FUNDAMENTAL APPLICATION OF CALCULUS

(3+0 Cr. Hr.)

## COURSE OBJECTIVES

To prepare the students, not majoring in mathematics, with the essential tools of calculus to apply the concepts and the techniques in their respective disciplines.

## COURSE CONTENTS:

- i. **Preliminaries:** Real-number line, functions and their graphs, solution of equations involving absolute values, inequalities.
- ii. **Limits and Continuity:** Limit of a function, left-hand and right-hand limits, continuity, continuous functions.
- iii. **Derivatives and their Applications:** Differentiable functions, differentiation of polynomial, rational and transcendental functions, derivatives.
- iv. **Integration and Definite Integrals:** Techniques of evaluating indefinite integrals, integration by substitution, integration by parts, change of variables in indefinite integrals.

## RECOMMENDED BOOKS

1. Atanacković, T. M., Pilipović, S., Stanković, B., & Zorica, D. (2014). *Fractional Calculus with Applications in Mechanics: Wave Propagation, Impact, and Variations Principles*. ISTE.
2. Giaquinta, M. (2016). *Multiple Integrals in the Calculus of Variations and Nonlinear Elliptic Systems.(AM-105)* (Vol. 105). Princeton University Press.
3. Baleanu, D., Diethelm, K., Scalas, E., & Trujillo, J. J. (2016). *Fractional Calculus*. World Scientific Publishing Company.
4. ALLYN, J. (2017). *BASIC TECHNICAL MATHEMATICS WITH CALCULUS: Books a la Carte Edition*. PRENTICE HALL.
5. Spivak, M. (2018). *Calculus on manifolds: a modern approach to classical theorems of advanced calculus*. CRC Press.