

Semester VI

Module Code: MATH-307
Module Title: **Real Analysis - II**
Module Rating: 3 Cr. Hours

The Riemann-Stieltjes Integrals

- Definition and existence of integrals
- Properties of integrals
- Fundamental theorem of calculus and its applications
- Change of variable theorem
- Integration by parts

Functions of Bounded Variation

- Definition and examples
- Properties of functions of bounded variation

Improper Integrals

- Types of improper integrals
- Tests for convergence of improper integrals
- Beta and gamma functions
- Absolute and conditional convergence of improper integrals

Sequences and Series of Functions

- Power series
- Definition of point-wise and uniform convergence
- Uniform convergence and continuity
- Uniform convergence and integration
- Uniform convergence and differentiation
- Examples of uniform convergence

Recommended Books

1. W. Rudin, *Principles of Mathematical Analysis*, 3rd edition, (McGraw Hill 1976)
2. R. G. Bartle, *Introduction to Real analysis*, 3rd edition, (John Wiley and sons, 2000)
3. T. M. Apostol, *Mathematical Analysis*, (Addison-Wesley Publishing Co., 1974)
4. A. J. Kosmala, *Introductory Mathematical Analysis*, (WCB company, 1995)
5. W. R. Parzynski and P. W. Zipse, *Introduction to Mathematical Analysis*, (Mc Graw Hill company, 1982)
6. H. S. Gaskill and P. P. Narayanaswami, *Elements of Real Analysis*, (Printice Hall, 1988)



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