

B.Sc. DEGREE PROGRAMME

**MATHEMATICS (OPEN COURSE)
FIFTH SEMESTER**

(For students not having Mathematics as Core Course)

VMT5D01 : MATHEMATICS FOR SOCIAL SCIENCES

3 hours/week

2 credits

Text Book: Edward T. Dowling : Calculus for Business, Economics and Social Sciences, Schaum's Outline Series, TMH, 2005.

Module I : Equations and Graphs (27 hrs)

- 2.1 Equations
- 2.2 Cartesian Coordinate System
- 2.3 Graphing linear equations
- 2.4 The slope of a line
- 2.5 Solving linear equations simultaneously
- 2.6 Solving quadratic equations
- 2.7 Practical applications

Functions

- 3.1 Concepts and definitions
- 3.2 Functions and graphs
- 3.3 The Algebra of Functions
- 3.4 Applications of linear functions
- 3.5 Facilitating non-linear graphs
- 3.6 Applications of non-linear functions- The derivative

- 4.1 Limits
- 4.2 Continuity
- 4.3 Slope of a Curvilinear function
- 4.4 Rates of change
- 4.5 The derivative
- 4.6 Differentiability and Continuity
- 4.7 Application

Differentiation

- 5.1 Derivative notation
- 5.2 Rules of differentiation
- 5.3 Derivation of the rules of differentiation

- 5.4 Higher order derivatives
- 5.5 Higher order derivative notation
- 5.6 Implicit differentiation
- 5.7 Applications

Module II : Uses of Derivative (27 hrs)

- 6.1 Increasing and decreasing functions
- 6.2 Concavity
- 6.3 Extreme points
- 6.4 Inflection points
- 6.5 Curve sketching

Exponential and Logarithmic functions

- 7.1 Exponential functions
- 7.2 Logarithmic functions
- 7.3 Properties of exponents and logarithms
- 7.4 Natural exponential and Logarithmic functions
- 7.5 Solving natural exponential and logarithmic functions.
- 7.6 Derivatives of natural exponential and logarithmic functions.
- 7.7 Logarithmic differentiation
- 7.8 Applications of exponential functions
- 7.9 Application of Logarithmic functions Integration

Anti differentiation

- 8.1 Rules for indefinite integrals Multivariable Calculus

Functions of several variables

- 9.1 Partial derivatives
- 9.2 Rules of partial differentiation
- 9.3 Second order partial derivatives

More of Integration

- 10.1 Integration by substitution
- 10.2 Integration by parts

References

1. Srinath Baruah : Basic Mathematics and its Applications in Economics, Macmillan.
2. Taro Yamane: Mathematics for Economists, Second ed., PHI.