

**V. CORE COURSE -C 4:**

(Credits: Theory-05, Tutorial-01)

**Marks : 25 (MSE: 1Hr) + 75 (ESE: 3Hrs)=100****Pass Marks (MSE + ESE) =40****Instruction to Question Setter for****Mid Semester Examination (MSE):**

There will be **two** group of questions. **Group A is compulsory** and will contain five questions of **very short answer type** consisting of 1 mark each. **Group B will contain descriptive type** six questions of five marks each, out of which any four are to answer.

**End Semester Examination (ESE):**

There will be **two** group of questions. **Group A is compulsory** and will contain two questions. **Question No.1 will be very short answer type** consisting of ten questions of 1 mark each. **Question No.2 will be short answer type** of 5 marks. **Group B will contain descriptive type** six questions of fifteen marks each, out of which any four are to answer.

**Note:** There may be subdivisions in each question asked in Theory Examinations.

**ELEMENTARY MATHEMATICAL METHODS IN ECONOMICS****Theory: 75 Lectures; Tutorial:15 Lectures****Course Description**

The objective of this course is to transmit the body of basic mathematics that enables the study of economic theory, at the undergraduate level, specifically the course on microeconomics theory, macroeconomics theory, international trade etc in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

**Course outline****1. Preliminaries**

Sets and set operations; relation; functions and their properties; number systems.

**2. Functions of one real variable**

Graphs; elementary types of function: quadratic, polynomial, power, exponential, logarithmic; sequences and series; continuous functions: properties with respect to various operations and applications; differentiable functions: characterizations, properties with respect to various operation and applications; second order derivatives: properties and applications. Concept of MR, MC, relationship between Total, Average, Marginal (Rev. & Cost).

**3. Single – variable optimization**

Geometric properties of function: local and global optima: geometric characterizations, characterizations using calculus and applications Profit maximization models.

**4. Exponential and Logarithmic functions and Logarithmic Derivation**

Exponential functions, Logarithmic functions, compound interest, Present values and capital values, derivatives of exponential and Logarithmic functions, Problem of capital and interest, Elasticity of a function, Elasticity of demand, Cost elasticity and Normal cost conditions.

**5. Integration**

Definite integrals, Indefinite integrals and inverse differentiation, technique of integration, Relation between average and marginal concepts, application in consumer's surplus.

**Basic Readings:**

- K. Sydsaeter and P. Hammond, Mathematics for Economic Analysis, Pearson Edu. Asia: Delhi,2002
- Chiang, Alpha C and Wainright Kevin Fundamental Methods of Mathematical Economics, Mc Graw Hill Education
- Allen, RGD Mathematical analysis for Economists
- Yamane, Taro (1975) mathematics Prentice Hall of India, New Delhi
- Koutsoyianis, A (1977) Theory of Econometrics (2nd Ed.) The Macmillan Press Ltd., London