



Anekant Education Society's
Tuljaram Chaturchand College
Of Arts, Science & Commerce, Baramati, Pune (MS)
Autonomous | Religious Minority Institute
Department of Economics

Certificate Course on Basic Mathematics, Statistics and Reasoning for Economics

Course Objectives:

1. Understand and apply basic mathematical concepts relevant to economics, including algebra, functions, and calculus.
2. Utilize statistical tools to analyze and interpret economic data.
3. Develop logical reasoning and problem-solving skills to approach economic problems systematically.
4. Analyze economic models using mathematical techniques, ensuring sound reasoning in decision-making.
5. Interpret quantitative data using statistical methods, preparing for further studies or careers in economics.
6. Enhance critical thinking skills by integrating mathematical, statistical, and reasoning approaches to economic problems.
7. Communicate quantitative findings effectively using appropriate mathematical and statistical terminology.

SYLLABUS

Module 1: Basic Mathematics for Economics

1. **Algebra and Equations:**
 - o Linear and quadratic equations
 - o Solving systems of linear equations
 - o Economic applications (e.g., equilibrium models)
2. **Functions and Graphs:**
 - o Understanding functions (linear, polynomial, exponential, and logarithmic)
 - o Graphical analysis and interpretation
 - o Economic applications: demand, supply, cost, and revenue functions
3. **Differentiation and Applications:**
 - o Rules of differentiation
 - o Marginal analysis: Marginal cost, revenue, utility, and productivity
 - o Elasticity of demand and supply
 - o Optimization: Profit maximization and cost minimization

Module 2: Basic Statistics for Economics

1. **Introduction to Descriptive Statistics:**
 - o Data collection and classification
 - o Measures of central tendency (mean, median, mode)



- Measures of dispersion (range, variance, standard deviation)
- 2. **Probability Theory and Distributions:**
 - Introduction to probability concepts
 - Probability distributions (normal, binomial, Poisson)
 - Applications in economic forecasting
- 3. **Sampling and Estimation:**
 - Sampling techniques
 - Point and interval estimation
 - Central Limit Theorem

Module 3: Logical Reasoning and Problem Solving

1. **Introduction to Logical Reasoning:**
 - Basic principles of logic
 - Inductive and deductive reasoning
 - Logical consistency and fallacies
2. **Quantitative Reasoning:**
 - Analyzing quantitative information
 - Problem-solving strategies in economics
 - Application of reasoning in economic decision-making
3. **Economic Reasoning and Critical Thinking:**
 - Economic decision-making models
 - Analyzing trade-offs and opportunity costs
 - Logical analysis of economic arguments

Course Duration:

- **Total Duration:** 18 Lecture 12 Practices
- **Class Schedule:** 2 hours per Day (Nine Days)

Teaching Methodology:

- **Workshops:** Focus on economic case studies and data interpretation
- **Group discussions:** Encourage peer learning and debate on economic reasoning
- **Assignments and quizzes:** To reinforce the material taught

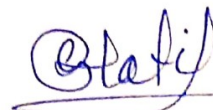
Evaluation:

- **Assignments:** 20%
- **Mid-term Exam:** 20%
- **Final Exam:** 40%
- **Class Participation:** 10%
- **Project/Case Study:** 10%

Recommended Textbooks:

1. **Mathematics for Economists** by Carl P. Simon & Lawrence Blume
2. **Introduction to Statistics and Econometrics** by Takeshi Amemiya
3. **Essential Statistics for Economics, Business and Management** by Teresa Bradley
4. **Mathematical Methods for Economics** by Michael W. Klein


Course Coordinator


Head of Department 15/10/19



HEAD
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