

Transportation Problem: Formulation, Solution by N.W. Corner Rule, Least Cost method, Vogel's Approximation Method (VAM), Modified Distribution Method; Degeneracy, Special cases: Multiple Solutions, Maximization case, Unbalanced case, Prohibited routes.

Assignment Problem: Hungarian Method, Special cases: Multiple Solutions, Maximization case, Unbalanced case, Restrictions on assignment.

Unit 3: Network Analysis

(12 Hours)

Basic Concept, Construction of AOA Network diagram, Critical Path Analysis, float and slack analysis (Total float, free float, independent float, Safety Float), probability consideration in PERT, Time-Cost Trade-off in Project.

Unit 4: Decision Theory

(12 Hours)

Decision making environment, Construction of Pay off Table, Opportunity Loss Table, Decision under uncertainty, Decision under Risk: EMV, EOL, EVPI.

Decision under Conflict: Game Theory, Two-person Zero-Sum games, Maximin Minimax Principle, Games without Saddle point- Mixed strategy, Dominance Rule; Reduction of m x n game and solution of 2x2, 2 x s, and r x 2 cases by Graphical Method.

Practical component (if any) - NIL

Essential/Recommended Readings

1. Vohra, N. D., Quantitative Management, Tata McGraw Hill.
2. Kanti Swarup, Gupta, P. K., & Man Mohan, Operations Research, Sultan Chand & Sons.

Suggested readings

1. Taylor, B. W., Introduction to Management Science, Pearson India.
2. Hillier, M. S., & Hillier, F. S., Introduction to Management Science, Pearson India.

Note: Latest edition of the readings may be used.

COMMON POOL OF GENERIC ELECTIVES (GE) COURSES

GENERIC ELECTIVES (GE-4): FUNDAMENTALS OF ECONOMETRICS

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
FUNDAMENTALS OF ECONOMETRICS (GE-4)	4	3	0	1	Class XII Pass	Nil

Learning Objectives

The Learning Objectives of this course are as follows:

- This course provides a comprehensive introduction to basic econometric concepts and techniques.
- It covers estimation and diagnostic testing of simple, multiple regression models, panel data models, and dummy variable regression with qualitative response regression models.

Learning Outcomes

The Learning Outcomes of this course are as follows:

- Understanding of basic econometrics and its assumptions and the impact of violations of classical assumptions.
- Interpretation of functional forms of regression model.
- Understanding of models using dummy variables and Qualitative Response Regression Models.

SYLLABUS OF GE-4

Unit 1

(12 Hours)

Introduction to Econometrics and an overview of its applications; Simple Regression with Classical Assumptions; Properties of estimators, Least Square Estimation and BLUE, Multiple Regression Model and Hypothesis Testing Related to Parameters – Simple and Joint. Functional forms of regression models.

Unit 2

(9 Hours)

Understanding the impact of change in scale of variables on output. Indicators of Goodness of fit of a model; Understanding and calculation of R Square and adjusted R Square. Understanding and calculation of information criteria for model selection: AIC, BIC, and HQC. Understanding of outliers and their impact on the model's output.

Unit 3

(12 Hours)

Violations of Classical Assumptions: expected value of error term is zero, normality, multicollinearity, heteroscedasticity, autocorrelation, and model specification errors, their identification, their impact on parameters; tests related to and impact on the reliability and the validity of inferences in case of, violations of Assumptions; methods to take care of violations of assumptions.

Unit 4

(12 Hours)

Dummy variables: Intercept dummy variables, slope dummy variables, Interactive dummy variables, Use of Dummy Variables to model qualitative/Binary/Structural changes, Response Regression Models or Regression Models with Limited Dependent Variables - Use of Logit, and Probit Models.

Practical component (30 Hours) –*Recommendation Computer Package to be used: Use of softwares like E-Views, R, and STATA to solve real-life problems and check assumptions, taking care of*

assumption violations, and test goodness of fit, and for estimation of Logit, and Probit Models is recommended.

Essential/Recommended Readings:

1. Christopher Dougherty. Introductory Econometrics. Oxford University Press.
2. Gujarati, N. Damodar. Basic Econometrics. New Delhi: McGraw Hill.
3. Gujarati, N. Damodar. Econometrics by Examples. New Delhi: McGraw Hill.

Suggested Readings:

1. Pindyck, Robert S. and Daniel L. Rubinfeld Econometric Models and Economic Forecasts. Singapore: McGraw Hill.
2. Ramanathan, Ramu (2002). Introductory Econometrics with Applications (5th ed.). Thomson South-Western.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.