

M. A. ECONOMICS SYLLABUS

(Based on CBSS)

PAPER CODE

ECO-501-Core- 4 Credits
ECO-502-Core- 4 Credits
ECO-503-Core- 4 Credits
ECO-504-Core- 4 Credits
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ECO-506-Core- 4 Credits
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ECO-511-Core- 4 Credits
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ECO-514-Core- 4 Credits
ECO-515-Core- 4 Credits
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ECO-516-Core- 4 Credits

Semester-I

Micro Economics - I
Macro Economics - I
Statistical Methods & Sampling
Monetary Economics
International Economics

Semester-II

Micro Economics - II
Macro Economics - II
Public Finance
Elements of Mathematical
Economics & Econometrics
Dissertation & Viva-Voce

Semester-III

India's Economic Policy-I
Growth Economics
Financial Institutions & Markets
Elective Group-I
Elective Group-II

Semester -IV

India's Economic Policy-II
Development Economics
Elective Group-I
Elective Group-II
Project Work & Viva-voce

ELECTIVE GROUPS

Group-I Eco-550 (International Trade Issues & Financial Institutions)

Eco-551-Core - 4 Credits- International Trade & Institutions

Eco-552-Core - 4 Credits- International Financial Issues

Eco-553-Core - 4 Credits- Regional Economic Cooperation

Eco-554-Core - 4 Credits- India's Foreign Trade

Eco-555-Core - 4 Credits- International Trade Laws

Group-II Eco-560 (Agricultural & Industrial Economics)

Eco-561-Core - 4 Credits- Economics of Agriculture

Eco-562-Core - 4 Credits- Indian Agriculture: Institutions and Issues

Eco-563-Core - 4 Credits- Rural Development

Eco-564-Core - 4 Credits- Economics of Industry & Industrial Organization

Eco-565-Core - 4 Credits- Industry & Development

Eco-566-Core - 4 Credits- Economics of Infrastructure & Transport

Group-III Eco-570 (Development Economics)

Eco-571-Core - 4 Credits- Population Studies

Eco-572-Core - 4 Credits- Demography

Eco-573-Core - 4 Credits- Economics of Education and Health/Economics
of Human Resources

Eco-574-Core - 4 Credits- Social Sector and Development Issues

Eco-575-Core - 4 Credits- Gender Economics

Group-IV Eco-580 (Public Policy)

Eco-581-Core - 4 Credits- Public Economics

Eco-582-Core - 4 Credits- Resource & Energy Economics

Eco-583-Core - 4 Credits- Environmental Economics

Eco-584-Core - 4 Credits- Environmental Issues & Institutions

Eco-585-Core - 4 Credits- Economics and Law

Group-V Eco-590 (Quantitative Economics)

Eco-591-Core-4 Credits- Advanced Econometrics

Eco-592-Core-4 Credits- Time Series Analysis & Computer Application

Eco-593-Core 4 Credits- Financial Econometrics

Eco-594-Core 4 Credits- Linear Economics

Eco-595-Core 4 Credits- Applied Econometrics

Eco-596Core- 4 Credits- Operations Research

Semester - I

ECO-501 Micro Economics -I (Core Course : 4 Credits)

Unit : 1

12 Lectures

Uses of Indifference Curve - Empirical Theory of Demand. Demand for Consumer Durables; Linear Expenditure Systems- Analysis of Uncertainty in Consumer Behavior, Some application of Individual choice under risk and uncertainty. Newman Morgenstern.

Unit : 2

12 Lectures

Production Function- Homogeneous Production Function : Cobb-Douglas Production Function; C.E.S. and V.E.S. Production Functions - derivation of cost function from the production function-Modern approach to the theory of costs-technical progress and techniques of production. Investment decisions and present value rule, some application of present value rule.

Unit: 3

12 Lectures

Welfare Economics: Pareto Optimum Conditions- Social Welfare Functions-compensation Principles- Arrow Impossibility Theorem, Amartya Sen on Arrow's Impossibility Theorem, Rawls, Concepts of Social Justice and Welfare Criterion -other obstacles of welfare maximization.

Unit: 4

12 Lectures

Partial and General Equilibrium; Existence, Uniqueness and Stability of Equilibrium- Concept of Excess Demand and Excess Price, Equilibrium in Lagged Market Model - Walrasian General Equilibrium, An Introduction to Input-Output Analysis

Reading List :-

Andrey Mas-Colell, Micro economic theory, Oxford University Press, USA
Blaug M., Economic Theory in Retrospect
Edwin Mansfield, Micro Economics, Gary Wynn Yohe.
Ferguson C.E. , Micro Economic Theory
Geoffrey A. Jchle , Philip J. Reny, Advanced Micro Economic Theory
Hall and Varian, Micro Economics
Henderson J.M. and Quandt R.E., Micro Economic Theory
Koutsoyiannis A., Modern Micro Economics, Macmillan
Townsend(ed) H. Readings in Price Theory

Semester - I

ECO-502 Macro Economics -I (Core Course: 4 Credits)

Unit I: **12 Lectures**
Macroeconomic Variables, National Income Identities and National Income Accounting - Growth Rates, Inflation, Deflator, Price Indices, Unemployment, Output Gap, Twin Deficits, Brief Review of System of National Accounts, Flow of Funds Accounts, Social Accounting Matrices.

Unit II: Micro Foundations of Macroeconomic Relationships **12 Lectures**
Consumption Analysis, Permanent Income and Life Cycle Hypotheses, Consumption under Uncertainty, Savings in inter-temporal models, Investment Theories: Neo-Classical and Keynesian, Money Demand, and Money Supply Function, Money Multiplier.

Unit III: National Income Determination Models in Short Run and Long Run and Price Level **12 Lectures**
IS-LM Analysis, Fiscal and Monetary Policy Multipliers, Phillips Curve, AS-AD Model, Neo-Classical Synthesis, Three Sector Model, Monetary and Fiscal Interaction.

Unit IV: Open Economy Macroeconomics **12 Lectures**
Foreign Trade Multiplier, Open Economy Model; Internal & External Balances. Economic Policies Model, SWAN Model, IS-LM-BOP Model.

Reading List:

Ackley, G. (1978), *Macroeconomics: Theory and Policy*, Macmillan, New York.
C. Rangrajan and Dholakia: *Principles of Macroeconomics*
Dipankar Dasgupta: *The Macroeconomy: A Textbook View* (1997) OUP.
Dornbusch, R. and F. Stanley (1997), *Macroeconomics*, McGraw Hill, Inc., New York.
G. Mankiw, *Macroeconomics*, McGraw Hill
Lipsey Crystal: *Macroeconomics*
Shapiro, E. (1996), *Macroeconomic Analysis*, Galgotia Publications, New Delhi.

Semester - I

ECO-503 Statistical Methods & Sampling (Core Course: 4 Credits)

Unit- I **12 Lectures**

Correlation and Regression Analysis
Multiple and Partial Correlation & Regression
Theory of Attributes

Unit- II **12 Lectures**

Elementary Probability Theory, Addition & Multiplication Theorems, Bayes Theorem, Concept of Random Variables, Mathematical Expectation.
Theoretical Probability Distributions- Binomial, Poisson, Normal Distributions (Without Proofs) and their Goodness of Fit.

Unit- III **12 Lectures**

Sampling Theory : Population and Sample, Parameter and Statistic, Objectives of Sampling, Types of Sampling.
Testing of Significance-Null & Alternative Hypotheses, Level of Significance, Confidence Level, Critical Region.
Sampling Distribution- Large Sample Tests, Distribution of Sample Mean and Sample Proportion, Chi-square Test.

Unit- IV **12 Lectures**

Estimation-Point and Interval Estimates of Mean, Characteristics of Good Estimator, Standard Error of Estimates.
Type I and Type II Errors, Interpretation of P-Value, One-tailed and Two-tailed Tests.
Small Sample Tests, Testing of Hypothesis of Mean, Variance, Correlation Coefficient, Regression Coefficient etc. based on Z, t, Chi-square & F-tests.

Readings List:

Chou Y., Statistical Analysis
Gupta S. C. and Kapoor V. K. : Fundamentals of Mathematical Statistics
Gupta S. P. ; Statistical Methods
Hogg R. V. and Graig A. T. : Introduction to Mathematical Statistics
M. R. Spiegel; Theory and Problems of Statistics
Nagar and Das ; Basic Statistics
WonneCoH and WonneCoH : Introductory Statistics for Business and Economics

Semester - I

ECO-504 Monetary Economics (Core Course : 4 Credits)

Unit -I

Money Supply

12 Lectures

Money: Concept and Functions

Money Supply: Concepts and Monetary Aggregates

Theory of Money Supply; High Powered Money and Money Multiplier;

Budget Deficits and Money Supply

Determinants of Supply of Money; RBI Approach, Indian Financial System

Unit -II

12 Lectures

Post-Keynesian Demand for Money

Demand for Money; Overview of Keynes's Liquidity Preference Approach

Concept of Neutrality of Money and Money Illusion

Pigou Effect and Patinkin's Real Balance Effect

Crisis in Keynesian Economics and the Revival of Monetarism- Theory of Demand - M. Friedman

Comparison of Keynesian and Monetarist Approach

Demand for Money in Underdeveloped Countries

Unit -III

12 Lectures

Development in the Theory of Demand for Money

Approaches of Baumol and Tobin, Turvey Approach.

Liquidity Approach - Redcliff Committee Report and Gurley-Shaw Thesis

Role of Technology in Monetary Development- Pesic and Siwek Approach

Unit -IV

12 Lectures

Theory of Inflation and Monetary Policy

Philips Curve and its Modifications: Tobin, Samuelson and Solow.

The Natural Rate of Unemployment and Stagflation, Adaptive Expectations

and Rational Expectations - Expectation Augmented Approach: Friedman-

Phelps and Lucas.

Reading List :-

Ahuja, H. L. Macroeconomics (New)

Chakravarty, S.C. (1985), Report of the Committee to Review the Working of the Monetary System, Reserve Bank of India, Bombay.

D'souza Errol, Macroeconomics: Person Publication, New Delhi.

- Friedman, M. (1957), *the Theory of Consumption Function*, Princeton University Press, Princeton.
- Gupta, Suraj B, *Monetary Planning for India*, Oxford University Press, Delhi.
- Gurley, J. and E.S. Shaw (1960), *Money in a Theory of Finance*, Brookings Institution, Washington.
- Gordon, R. and S.G. Harris (1998), *Macroeconomics*, Addison Wesley, Massachusetts.
- India - A Central Banker's Perspective, UBSPD, New Delhi.
- Jha, R. (1999), *Contemporary Macroeconomic Theory and Policy*, New Age International (P) Ltd., New Delhi.
- Johnson, H.G and Nobay A.R., *Issues in Monetary Economics*, Oxford University Press, Delhi.
- Keynes, J.M. (1936), *the General Theory of Employment, Interest and Money*, Macmillan, London.
- Mankiw, N.G. and D. Romer (Eds.), *New Keynesian Economics*, (2 Vols.), MIT Press, Cambridge.
- Mithani, D. M., *Money Banking and International Trade*.
- Paul, R. R., *Monetary Economics*.
- Patinkin, D. (1965), *Money, Interest and Prices*, Harper and Row, New York.
- Reddy, Y.V. (2000), *A Review of Monetary and Financial Sector Reforms in* Shapiro, E. , *Macroeconomic Analysis*, Galgotia Publications, New Delhi.
- Sheffrin, S.M. (1996), *Rational Expectations*, Cambridge University Press, Cambridge.

Semester - I

ECO-505 International Economics (Core Course: 4 Credits)

Unit-I

12 Lectures

Critical Overview of Classical Trade Theories, Neo-Classical Theory of Trade. Modern Theory of Trade: Heckscher-Ohlin Theorem, Factor Price Equalization Theorem, Stolper-Samuelson and Rybczynski Theorem. New Theories of International Trade: Kravis Theory of Availability, Linder's Theory of Volume of Trade, and Posner's Imitation Gap Theory.

Unit-II

12 Lectures

Intra-Industry Trade: The Neo-Heckscher-Ohlin Model, Neo-Chamberlin

Model, Neo-Hotelling Model, and The Brander-Krugman Model. Measurement of Intra-Industry Trade (Grubel-Llyod Index, Bela Balassa Index, etc), Strategic Trade Theory. Michael Porter's Theory of International Trade.

Unit-III

12 Lectures

Protection: Tariff and Non Tariff Barriers. Effective Rate of Protection. Trade Taxes and Welfare. Effects of Tariffs and Non-Tariff Barriers: Dumping, Subsidies, International Cartels, Technical Barriers, VERs, QERs, Standards, Health and Other Regulations. The Metzler Paradox. Currency and Commodity Swaps.

Unit-IV

12 Lectures

Overview of the Balance of Payments, Monetary Approach to Balance of Payments, Adjustment and Equilibrium in Balance of Payments, The Elasticity Approach, The Absorption Approach, International Capital Movements, Short-term Flows, Private Capital Flows, Direct and Portfolio Investments. Foreign Exchange Markets and Exchange Rate, Spot and Forward Rates, Future and Options. Exchange Risks, Hedging and Speculation, Interest Arbitrage and Efficiency of Foreign Exchange Markets.

Reading List-

Bo Sodersten & Geoffrey Reed, International Economics, MacMillan Press Limited, Hampshire & London.

D. Salvatore, International Economics, New York, John Wiley.

Francis Cherunilam, International Economics, Tata McGraw Hill Publishing Company Ltd., New Delhi.

H. G. Mannur, International Economics, Vikash Publishing House, New Delhi.

M. C. Vaish & Sudama Singh, International Economics, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

M. L. Jhingan, International Economics, Vrinda Publication, New Delhi.

Paul R. Krugman & Maurice Obstfeld, International Economics (Theory & Policy), Addison Wesley Longman, Pearson Education, Indian Branch, New Delhi.

Parthapratim Pal, International Trade and India, Oxford University Press, New Delhi.

P. Kenen, International Economics, Cambridge Publication, New Delhi.

Rana & Verma, International Economics, Vishal Publishing Co., Jalandhar, India.

S. Kindleberger, International Economics, Traveller Book Sell, New Delhi.

T. N. Srinivasan, Growth, Sustainability, and India's Economic Reforms, Oxford University Press, New Delhi.

W. W. Cordon, Theory of Protection.

Semester - II

ECO-506 Micro Economics-II (Core Course: 4 Credits)

Unit : I 12 Lectures

Alternative to Profit Maximization, Managerial Theory-Baumol, Marris, Williamson's model, Limit Price Theory-Bains, Labini, Modgiliani, Behavioristic Theory - Cyert, Moses Average Cost Pricing Principle- Shadow Prices and Their Uses.

Unit : II 12 Lectures

Factor Pricing: in Imperfect Competition : Collective Bargaining. Imperfections in Labour Market and Wage - Review of Keynesian and Loanable Fund Theory of Interest, Hicks Hansen Co-ordination. Theory of Profit-Shackle Approach, Mehta Approach.

Unit : III 12 Lectures

Intertemporal Choice and Markets with Asymmetric Information, the Information Problem. Asymmetric Information and the Market Failure, Measures to Solve the problem of Adverse Selection, Moral Hazard and Allocative Inefficiency, Principal Agent Problem, Bounded Rationality.

Unit : IV 12 Lectures

Theory of Games and Strategic Behavior. Cooperative and Non-cooperative Games,. The Prisoners Dilemma Oligopoly Theory. The Nash Equilibrium, Deuman- Morgenstern's Game Theory, Mixed Strategy, Strategic Moves, Entry Deterrence Iterated Elimination of Dominated Series, Two Persons Zero Sum Game.

Reading List :-

Andrey Mas-Colell, Micro economic theory oxford university press, USA

Blaug M, Economic Theory in Retrospect

Edwin Mansfield, Micro Economics by Gary wynn yohe.
 Ferguson C.E., Micro Economic Theory
 Geoffrey A. Jchle , Philip J. Reny, Advanced Micro economic theory
 Hall and Varian, Micro Economics
 Henderson J.M. and quandt R.E. Micro Economic Theory
 Koutsoyiannis A. Modern Micro Economics, Macmillan
 Townsend(ed) H. Readings in Price Theory

Semester - II

ECO-507 Macro Economics-II (Core Course: 4 Credits)

Unit I: Trade Cycles and Long Run Stable Equilibrium **12 Lectures**

Linkage of Time Series Analysis to Business Cycles, Types and Phases of Business Cycles Period and Amplitude of Cycles. Schumpeter Model, Theory of Multiplier-Accelerator Interaction, Short and Long Run Adjustments and Stabilisation.

Unit II: New Classical Macroeconomics and Real Business Cycles

12 Lectures

Rational Expectation Equilibrium Models, Lucas Critique, Incomplete Information Models, Persistence of Output Fluctuations.

Unit III: New Keynesian Theories of Business Cycles and Unemployment **12**

Lectures

Incomplete Nominal Adjustments, Real vs Nominal Rigidities, Real Non-Walrasian Theories, Coordination Failures, The Efficiency Wage Model, Insider-Outsider Model, Hysteresis, Search and Matching Models, Applications to Open Economy

Unit IV: Macroeconomic Policy Issues

12 Lectures

Historical Development of Macro Economic Policies: Objectives, Targets, Indicators & Instruments of Macro Economic Policies.

(a) Fiscal Policy

(b) Monetary Policy

Activist Policy, Gradualism vs Shock Therapy, Rules vs Discretion, Dynamic Inconsistency Problem, Inflation Targeting, Seignorage, Barro-Ricardo and Blinder-Solow Hypothesis

Lagged related Issues of Fiscal & Monetary Policy.

Reading List :-

David Romer, Advanced macroeconomics, 2e McGrawHill 2001

Oliver J Blanchard and Stanley Fischer, Lectures on macroeconomics, Prentice Hall, New Delhi

Mankiw, N. G. and D. Romer (Eds.) (1991), New Keynesian Economics, (2 Vols.), MIT Press, Cambridge.

Semester - II

ECO-508 Public Finance (Core Course: 4 Credits)

Unit-I

14 Lectures

Role of Government in an Economy: The Allocation, Distribution and the Stabilisation Functions; Private Goods, Public Goods, and Merit Goods; Market Failure Imperfections, Decreasing Costs, Externalities.

Theory of Public Choice: Problems of Preference Revelation and Aggregation - Voting System, Politico Economic Interactions, Pressure Groups & Interest Groups, Bureaucracy, Rent Seeking and Directly Unproductive Profit Seeking (DUP) Activities, Nordhaus-the Political Business Cycle.

Public Expenditure: Meaning and Scope, Theories of Public Expenditure-Pigou's Ability to Pay Theory, Benefit Principle, Samuelson Theory, Adolph Wagner Hypothesis and Peacock Wiseman Hypothesis, Colin Clark.

Unit-II

10 Lectures

Taxation: Introduction, Concept of Equity in Taxation, Benefit Principle of Taxation- Bowen Model & Lindahl Model, Samuelson's Optimal Allocation of Social and Private Wants.

Taxable Capacity: Conceptual Framework, Absolute and Relative Taxable Capacity, Factors Determining Taxable Capacity, Taxable Capacity & Ability to Pay.

Unit-III

10 Lectures

Fiscal Policy: Objectives and Instruments of Fiscal Policy, Built in Stabilizers, Compensatory Fiscal Policy, Functional Finance Approach, Budget Multiplier Fiscal Policy and Developing Countries.

Unit-IV

14 Lectures

Public Debt: Objectives & Importance of Public Debt, Classical Theory of Public Debt, Pay-as-you use & Pay-as-you go finance, Inter-generational Equity, Debt Burden & Future Generation, Shifting of Burden, Redemption

of Public Debt, Debt Management and Monetary Policy.

Reading List :-

- Atkinson A and J Stiglitz, Lectures in Public Economics, MC Graw Hill 1980.
- Bailey, S.J Public Sector Economics, Macmillan (2004).
- Boadway R and Bruce (1984).Welfare Economics-Basil Black well Oxford
- Duff L. (1997), Government and Market, Orient Longman, New Delhi.
- D.C Muller, (1979), Public Choice. Cambridge University Press.
- Friedman A. (1986). Welfare Economics and Social Choice Theory Martins Nighoff, Boston .
- Harper and Row (1957). A Downs An Economic Theory of Democracy.
- J. E. Stiglitz, Economics of Public Sector, Norton (1986).
- Jha R., Modern Public Economics, Routledge, London (1999).
- Lekhi, R. K., Public Finance, Kalyani Publishers, Ludhiana, Latest Edition.
- Lal S. N., Problem of Public Borrowing in India, Bombay.McGraw Hill Book Company, New York.
- Meier .G.M and Rauch, Leading Issues in economic development, UP (2000).
- Mishan E.J Introduction to Normative Economics, OUP (1986).
- Pogu T F and L.G Sgontz, Government and Economic Choice, an Introduction to Public Finance, Hengton Mul..... Boston.
- Quick.J and R.Sapanick, Introduction to General Equilibrium theory and Welfare Economics, Mc Graw Hill, New York (1968).
- Richard A. Musgrave (1989), Public Finance in Theory and Practice
- R. Goode Govt., Finance in Developing Countries, Tata Mc Graw Hill (1986).
- R. Cornes and T. Sandler, The Theory of Externalities Public Goods and Club Goods, Cambridge University Press-1986.
- Rosan S Harve, Public Finance, Irwin Publications in Economics, USA.
- Richard A. Musgrave Public Finance in Theory and Practice, McGraw Hill Book Company, New York(1989).
- Singh S K, Public Finance in Developed and Developing Countries, S. Chand and Company Ltd, New Delhi(1986).

Semester - II

ECO-509 Elements of Mathematical Economics & Econometrics

Unit- I

12 Lectures

Mathematical Operations on Matrices, Determinants, Minors, Cofactors and Inverse of Matrices, Solution of Simultaneous Equations using Inverse and Cramer's Rule; Matrices and their Applications in Economics.

Input -Output Analysis.

Graphical Approach to Linear Programming: Description of Simple Linear Programming Problems.

Unit- II

12 Lectures

Derivatives and its Application in Economics, Taxation Problems.

Partial Differentiation First Problems and Second order Derivatives, Total Differentiation.

Economic Applications of Partial Differentiation-Use of Lagrange Multiplier.

Homogenous Function. Euler's Theorem and its Application in Economics, Cobb-Douglas Production Function & and its Properties, Leontief and CES Production Function. Elasticity of Substitution.

Unit- III

12 Lectures

Integral Calculus - Rules of Integration, Indefinite and Definite Integrals, Application of Integration in Finding Total Functions of Economic Variables from Marginal Functions - Consumer's and Producer's Surplus.

Simple Differential Equations & Its Application.

Unit-IV

12 Lectures

Elementary Treatment of Difference Equations & its Application in Economics.

Econometrics: Nature and its Relation to Statistics and Mathematical Economics. Importance and Uses of Econometrics; Methodology of Econometric Research; Simple Linear OLS Regression Model: Assumptions and Estimation of Simple Linear OLS.

Reading List :-

Allen, R.G.D: Mathematical Analysis For Economists.

Archibald, G. and Lipsey, R.G., Introduction to Mathematical Treatment of Economics.

Ailchison, J. and Brown, J.A.C.: The Log-normal Distribution.

Baumol, W.J., *Economic Theory and Operations Analysis*.
 Beckerman, W., *An Introduction to National Income Analysis*.
 Chiang, A.C., *Fundamental Methods of Mathematical Economics*.
 Dorfman, R., Samuelson, P.A. and Solow, R., *Linear Programming and Economic Analysis*.
 Edey and Peacock, *National Income and Social Accounting*.
 Gujarati, D. N. (1995), *Basic Econometrics (IInd Edition)*, New Delhi, MCGraw-Hill.
 Henderson, J.M. and Quandt, R.E., *Microeconomic Theory: A Mathematical Approach*.
 Koutsoyiannis, A. (1997), *Theory of Econometrics (IInd Edition)*, London, the Macmillan Press.
 Krishna, K. L., (1997), *Econometric Applications in India*, New Delhi, Oxford University Press.
 Kamenta, J. (1997), *Elements of Econometrics*, New York, University of Michigan Press.
 Lange, Oscar, *Introduction to Econometrics*.
 Mehta B. C. And Madnani G.M. K., *Econometrics*, Latest Edition.
 Mehta, B.C., *Mathematical Economics: Microeconomic Models*.
 Maddala, G.S. (Ed.) (1993), *Econometrics Method and Applications*, (2 vols.) U. K.; Alders Hot.
 Sen, A., *On Inequality*.
 Sen, A., *Poverty: An Ordinal Approach to Measurement*, *Econometrica*.
 Stone, R. and Murray, C., *Social Accounting and Economic Models*.
 Yamane, T., *Mathematics for Economists*.

Semester - III

ECO-511 India's Economic Policy-I (Core Course: 4 Credits)

UNIT 1: Theory of Economic Policy

12 Lectures

Pareto-Optimality
 Market Failures
 Causes of Market Failures
 Role of State

Economic Policy- Instruments, Targets- Fixed and Flexible, Conflicts
Government Failures.

UNIT 2: Agricultural Policy in India

12 Lectures

An Overview of Agricultural Policy in India
New Agricultural Policy
Agricultural Price Policy of India
Public Distribution System in India
Food Security in India

UNIT 3: Industrial Policy of India

12 Lectures

An Overview of Industrial Policy in India
New Industrial Policy
Public Sector in India
Micro, Small and Medium Enterprises in India
Cottage Industry in India

UNIT 4: Environment and Energy

12 Lectures

Environmental Issues in India
Development of Environmental Policy in India
Development of Energy Policy in India

Reading list

Acocella, Nicola, Economic Policy in the Age of Globalisation

Acharya, S.S. and Chaudhari, D.P., Indian Agricultural Policy at the Cross-roads : Priorities and Agenda

Ahuja, Astha, Agricultural and Rural Development in India

Beder, Sharon , Environmental Principles and Policies : An Interdisciplinary Introduction

Chand ,Ramesh, India's Agricultural Challenges : Reflections on Policy, Technology and Other Issues

Ghosh, Amitabh, The Great Derangement : Climate Change and the Unthinkable

Guha, Ramchandra, Environmentalism : Global History

Habib, Irfan, Man and Environment

Hashim,H.R.,Chalpati Rao,K.S., Ranganathan K.V.K.and Murthy,M.R., (eds),
India's Industrial Development and Globalisation
Majumdar, N.A. and Kapila,Uma, Indian Agriculture in the New
Millennium
Rangarajan, Mahesh , Environmental Issues in India
Rosencranz,Armin, Shyam,Divan, Noble and Martha,L., Environmental Law
and Policy in India
Satyanarayana,J., The New Industrial Policy And Its Impact on India's Indus-
trial Economy
Sen, A.K., On Ethics and Economics
Swaminathan,M.S. , Sustainable Agriculture : Towards Food Security
Swaminathan,M.S. , An Evergreen Revolution
Tinbergen,J., Economic Policy, Principles and Design
Tinbergen,J., On the Theory of Economic Policy
Vyas, V.S., India's Agrarian Structure, Economic Policies and
Sustainable Development

Semester - III

ECO-512 Growth Economics (Core Course: 4 Credits)

Unit1: **12 Lectures**

Economic Growth: Problem, General Solution, Growth Equilibrium: Existence, Uniqueness and Stability.

Approaches to Growth: Classical and New Classical Approaches, Structural and Institutional Approaches, Marxist/New Marxist Approaches

Dependency Theories: Historical Perspective/Experience of Development, Structural Change (Chenry).

Unit 2: **12 Lectures**

Neo-Keynesian Models of Growth: N. Kaldor, L. Pasinetti and Mrs. Joan Robinson; Concept of Golden Age and Golden Rule of Accumulation.

Indian Plan Models- Mahalanobis, Tendulkar and Macroeconomic Consistency Model.

Unit 3: **12 Lectures**
Technical Progress in Macro Production Function, Endogenous Growth Models: AK Model, Lucas Model of Human Capital, Romer Model of Endogenous Innovation, Theory of Convergence and Divergence: The Classical approach to Convergence Analysis, Introduction of Stochastic Model.

Unit 4: **12 Lectures**
Solow-Swan Model, Introduction of Infinite Horizon Model, Basics of Overlapping-Generations (Diamond) Model, Mundell-Fleming Open Economy Model **12 Lectures**

Reading List-

Adelman, I., Theories of Economic Growth and Development, Stanford University Press

Blanchard, O. and Fischer, S., Lectures on Macroeconomics, (1989)

Barro, Robert J. and Xavier Sala-i-Martin: Economic Growth, McGraw-Hill

H.G. Jones, An Introduction to Modern Theories of Economic Growth

Hahn F.H., Readings in Theory of Growth, Macmillan McGraw-Hill Book Company

J.K.Mehta, Economics of Growth, Asia Publishing House

Jones C.I., Introduction to Economic Growth, W.W. Norton & Company, New York

K.N.Kabra, Development Planning in India, Sage Publications, New Delhi

Lucas, Robert, On the Mechanics of Economic Development, JPE (July 1988)

Meier and Rauch, Leading Issues in Economic Development, OUP

Romer, David, Advanced Macroeconomics, New York: McGraw-Hill,

Ray, D., Development Economics, OUP.

Romer, Paul, Endogenous Technological Change, Journal of Political Economy (Oct. 1990)

Stiglitz J.E. & Uzawa H, Readings in Modern theory of Economic Growth, The M.I.T. Press

Sen, A.K, Growth Economics, Penguin Books.

Thirlwall, A.P., Growth and Development, ELBS

Semester - III

ECO-513 Financial Institutions & Markets (Core Course: 4 Credits)

UNIT-I

12 Lectures

Financial Intermediation and Financial Intermediaries
The Structure and Functions of the Financial System
Indicators of Financial Development, Criteria to Evaluate Assets: Risk and Financial Assets, Types of Risk, Risk Return Trade Off.
Trend in Saving and Investment in India - Role of Financial Intermediaries.
Financial System and Economic Development

UNIT-II

12 Lectures

Banking in India

Growth and Structure of Commercial Banks in India, Critical Evaluation of Performance, Reforms and Challenges. Credit Creation and its Control.
Co-operative Banks: Performance and Policy.
Development Banks - Role and Development
Interest Rates in India -Status and Issues; Inflation in India - Status and Issues;
RBI - Objectives, Functions and Monetary Policy. Recent Monetary policy and Prospects for Investment in India.
Banking Development and Current Technological Innovations.
International Practices and Banking System in India.
Role & Working of IFCI, ICICI, IDBI, EXIM Bank SIDBI, SFC's.

UNIT-III

12 Lectures

Financial Markets and Non-Banking Institutions

Role and Structure of Money Market Call Money Market. Treasury Bill Market, Commercial Bill Market, Government Securities Market.
Capital Market- Primary and Secondary Market in India (Introduction of its Structure and Functions).
Markets for Derivatives: Futures and Options, and Other Derivatives: Types, Uses and Pricing of Derivatives, Concept of Hedgers, Speculators, Arbitrageurs.
Non-Banking Financial Institutions: Nature, Significance, Types and Performance, Regulations in India. Functions of General & Life Insurance Company, Mutual Funds.

UNIT-IV

12 Lectures

Market Regulation

SEBI: Functions, Roles (it's Impact on the Working of Capital Market in India)and Challenges

Financial Instruments- Concepts and Development. Securites (Bond, Debenture, Equities) and Share Price Indices.

Globalisation and Financial Market- Role of FDI and FPI

Role of Financial Market in Indian Economic Development

Reading List :-

Bhole, L.M. (1999), Financial Institutions and Markets, Tata McGraw Hill Company Ltd., New Delhi.

Bharati Pathak (2009), The Indian Financial System: Pearson Education Publication New Delhi

Bhole, L.M. (2000), Indian Financial System, Chugh Publications, Allahabad.

Chandra, P.Chandra, P. (1997), Financial Markets, (4th Edition), Tata McGraw Hill, New Delhi.

Gupta, S.B. (1983), Monetary Economics, S. Chand & Company, New Delhi.

Gupta, L.C. (Ed.) (1999), India's Financial Markets and Institutions, Society for Capital Research and Development, Delhi.

Hanson, J.A. and S. Kathuria (Eds.) (1999), India : A Financial Sector for the Twenty-first Century, Oxford University Press, New Delhi.

Harker, P.T. and S.A. Zenios (2000) (Ed.), Performance of Financial Institutions, Cambridge University Press, Cambridge.

Johnson, H.J. (1993), Financial Institutions and Markets, McGraw Hill, New York.

Khan, M.Y. (1996), Indian Financial System, Tata McGraw Hill, New Delhi.

Machiraju, M.R. (1999), Indian Financial Systems, Vikas Publishing House, New Delhi.

Ohlson, J.A. (1987), The Theory of Financial Markets and Institution, North Holland, Amsterdam.

Ranganjan, C. (1999), Indian Economics : Essays on Money and Finance, UBS Publication, New Delhi.

R.B.I. (1985), Report of The Committee to Review the Working of the Monetary system (Chakravarty Committee), Bombay.

SEMESTER - IV

ECO-514 India's Economic Policy-II (Core Course: 4 Credits)

UNIT 1: Monetary Policy	14 lectures
Role and Objectives in Developing Countries	
Instruments of Monetary Policy	
Monetary Policy of India during Plans Post-1991	
Monetary Policy and Inflation in India	
Conduction of Monetary Policy in Recent years	
UNIT 2: Commercial Policy	14 lectures
India's Balance of Payments during Plans	
India's Foreign Trade Policy	
Foreign Capital and India	
Forex Policy of India- FERA, FEMA	
UNIT 3: India's Population Policy	10 lectures
Demographic Structure of India	
Occupational Structure of India's Population	
India's Population Policy	
Census in India- Main Features of 2011 Census	
UNIT 4: Environment and Energy	10 lectures
Poverty, Inequality and Unemployment.	
Reading List:-	
Amartya Sen, Development As Freedom, Oxford University Press	
A K Sen, Growth Economics, Penguin Books	
Amartya Sen, Collective Choice and Social Welfare on Economic Inequality, Oxford University Press	
Amartya Sen, Employment, Technology and Development, Oxford University Press	
Amartya Sen: Poverty and Famine: An Eassy on Entitlement and Deprivation, Oxford University Press	
Amartya Sen and Jean Dreze: India: Economic Development and Social Opportunity, Oxford University Press	
Amartya Sen, Resources, Values and Development, Oxford University Press	
A.P.Thirlwall, Growth and Development, ELBS	
Benjamin Higgins, Economic Development, University Book stall, New Delhi	

C.P. Kindleberger, Economic Development, Mc Graw Hill, New York
UNDP, Human Development Report
D Ray, Development Economics, Oxford University Press.
Hollis Chenery & T.M.Srinivasan, Handbook of Development Economics,
North Holland
Meier and Rauch, Leading Issues in Economic Development, Oxford
University Press
M.P.Todaro and S.C.Smith, Economic Development, Pearson.
Majumdar, Basu and Mitra (ed), Capital, Investment and Development,
Essays in Memory of Sukhamoy Chakravarty, Oxford University Press
N.Gimmel, Surveys in Development Economics, Blackwell Oxford.
P. Dasgupta, In Inquiry into Well Being and Destitution, Oxford University
Press
S Ghatak, Introduction to Development Economics, Routledge.
Y Hayami and Y Godo, Development Economics, From the Poverty to the
Wealth of Nations (3rd Edition), Oxford University Press.

SEMESTER - IV

ECO-515 Development Economics (Core Course : 4 Credits)

- Unit1:** **12 Lectures**
The Concept of Development: Traditional views to the New Economic View
of Development, Underdevelopment as Coordination Failure (O-Ring Theory),
Measuring Economic Development: Measures of Development Including HDI
and Sen's Capabilities and Entitlement.
- Unit 2:** **12 Lectures**
Resources and Development: Population, Education, Health, Gender, Pov-
erty, Inequality, Unemployment, Urbanization, Rural - Urban Linkages (Ag-
riculture-Industry relationship) & Migration - Theories and Empirical Evi-
dence (Harris-Todaro Model), Environment.
- Unit3:** **12 Lectures**
Role of Internal Finance in Development: Domestic Financial Resources for
Development, Microfinance - Theory, Issues & Empirical Evidence, Fiscal

Policy and Economic Development.

Unit 4:

12 Lectures

Role of External Finance in Development: External Aid, FDI and MNCs Activity, Role of Trade and Technology in Development.

Institutions and Economic Development: Social Network as an Institution, Elementary Idea of Political Economy of Development.

Reading List :-

A.P.Thirlwall, Growth and Development, ELBS

Amartya Sen, Development As Freedom, Oxford University Press

A K Sen: Growth Economics, Penguin Books

Amartya Sen, Collective Choice and Social Welfare on Economic Inequality, Oxford University Press

Amartya Sen, Employment, Technology and Development, Oxford University Press
Amartya Sen: Poverty and Famine: An Essay on Entitlement and Deprivation, Oxford University Press

Amartya Sen and Jean Dreze, India: Economic Development and Social Opportunity, Oxford University Press

Amartya Sen, Resources, Values and Development, Oxford University Press

Benjamin Higgins, Economic Development, University Book stall, New Delhi

C.P. Kindleberger, Economic Development, Mc Graw Hill, New York

D Ray, Development Economics, Oxford University Press.

Hollis Chenery & T.M.Srinivasan, Handbook of Development Economics, North Holland

Meier and Rauch, Leading Issues in Economic Development, Oxford University Press

M.P.Todaro and S.C.Smith, Economic Development, Pearson.

Majumdar Basu and Mitra (ed), Capital, Investment and Development, Essays in memory of Sukhamoy Chakravarty, Oxford University Press

N. Gimmel, Surveys in Development Economics, Blackwell Oxford.

P. Dasgupta, In Inquiry into Well Being and Destitution, Oxford

University Press

S Ghatak, Introduction to Development Economics, Routledge.

UNDP, Human Development Report

Y Hayami and Y Godo, Development Economics, From the Poverty to the Wealth of Nations (3rd Edition), Oxford University Press

Elective Groups

GROUP-I (International Trade Issues & Financial Institutions)

ECO-551- International Trade & Institutions (Elective - 4 Credits)

Unit-I

12 Lectures

International Trade and Financial Institutions, Prior to Bretton-Woods, The Bretton-Woods Era, IMF. Development in the International Monetary System after 1971. International Reserves and Problems of Liquidity in Present Context. International Monetary Agreement.

Unit-II

12 Lectures

Development Institutions: IBRD, IFC, MIGA. Modern Regional Banks: Asian Development Bank, BRICS, SAARC.

Unit-III

12 Lectures

Trade and Development: General Agreement on Tariffs & Trade (GATT) and UNCTAD, Agreement of WTO.

Unit-IV

12 Lectures

GATT 1994: Agreement on Agriculture, Agreement on Dumping and Countervailing Duties, SPSS. General Agreement on Trade in Services (GATS), TRIPS, TRIMS, Future of WTO, WTO and India.

Reading List-

Bo Sodersten & Geoffrey Reed, International Economics, MacMillan Press Limited, Hampshire & London.

D. Salvatore, International Economics, New York, John Wiley.

Francis Cherunilam, International Economics, Tata McGraw Hill Publishing Company Ltd., New Delhi.

H. G. Mannur, International Economics, Vikash Publishing House, New Delhi.
M. C. Vaish & Sudama Singh, International Economics, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

Paul R. Krugman & Maurice Obstfeld, International Economics (Theory & Policy), Addison Wesley Longman, Pearson Education, Indian Branch, New Delhi.

Rana & Verma, International Economics, Vishal Publishing Co., Jalandhar, India.

S. Kindleberger, International Economics, Traveller Book Sell, New Delhi.

Elective Groups

GROUP-I (International Trade Issues & Financial Institutions) ECO-552- International Financial Issues (Elective - 4 Credits)

Unit-I **12 Lectures**

Globalization, History and Development, Globalization and Development Strategies, International Migration, Globalization and Economic Development. New Developments and Policy Challenges.

Unit-II **12 Lectures**

From Miracle to Crisis: East Asia, Global Financial Crisis, Origin of Global Recession, The Sub-Prime Crisis and the World Economy, Revival of the Global Economy, Sovereign Debt: Euro Crisis, Crisis in (Portugal, Ireland, Italy, Spain & Greece) PIIGS, Global Financial Crisis and Sustainability of Growth. Future Prospects in Context of Indian Economy.

Unit-III **12 Lectures**

Financial Flows, Size and Structure of Multinationals, Foreign Direct Investments, Merger and Acquisitions. Flow of Foreign Capital in Less Developed Countries: Form, Advantages and Disadvantages. Euro Currency Market and International Bond Market.

Unit-IV **12 Lectures**

International Monetary Regulations: BASEL Norms, Law and Economics. International Trade and Money Regulations and India.

Reading List-

Department of Economic Affairs, Ministry of Finance, GoI, Economic Survey, Various Issues, General Manager, Government of India Press, Minto Road, New Delhi.

Joshi, V. & Little, I. M. D., India's Economic Reforms (1991-2001), Oxford India Paperbacks, New Delhi.

Kapila, U., India's Economic Development Since 1947, Academic Foundation, New Delhi.

Marrewijk, C. V., International Economics-Theory, Applications, and Policy, Oxford University Press, New Delhi.

Nayyar, D., Trade and Globalization, Oxford Collected Essays, Oxford University Press, New Delhi.

Parthapratim Pal, International Trade and India, Oxford University Press, New Delhi.

Srinivasan, T. N., Growth, Sustainability, and India's Economic Reforms, Oxford University Press, New Delhi.

Sundaram, N. M., Global Finance Capital on Rampage, Adhyayana Prakashana, Karnataka.

Elective Groups

* **GROUP-I (International Trade Issues & Financial Institutions)**
// **ECO-553- Regional Economic Cooperation (Elective - 4 Credits)**

Unit-I **12 Lectures**
Regional Economic Cooperation: Importance & Scope, Types: Economic, Monetary, Trade, etc. Bilateral Trade Agreement, Zipf's Law and Gravity Equation, Revealed Comparative Advantage Model.

Unit-II **12 Lectures**
Preferential Trading: Free Trade Agreements: Definition, Scope and Importance, SAFTA, NAFTA, ASEAN.

Unit-III **12 Lectures**
Preferential Trading, Economic Integration and Regional Groupings. Theories of Customs Union: Partial Equilibrium Approach, The General Equilibrium Approach, The Viner Model, The Vanek Model and The Lipsey Model.

European Union, India and European Union.

Unit-IV

12 Lectures

India and Future of Regional Economic Cooperation: APEC. Pressure Group Combination and International Negotiations: G 20 and G 33. New International Economic Order, North-South Debate, Non-Aligned Movement.

Reading List-

Bo Sodersten & Geoffrey Reed, International Economics, MacMillan Press Limited, Hampshire & London.

D. Salvatore, International Economics, New York, John Wiley.

H. G. Mannur, International Economics, Vikash Publishing House, New Delhi.

Kushwaha G. S., Regional Economic Cooperation in South East Asia.

M. C. Vaish & Sudama Singh, International Economics, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

Marrewijk, C. V., International Economics-Theory, Applications, and Policy, Oxford University Press, New Delhi.

Nayyar, D., Trade and Globalization, Oxford Collected Essays, Oxford University Press, New Delhi.

Nayyar, D. (ed.), Trade and Industrialization, Oxford University Press, New Delhi.

Rana & Verma, International Economics, Vishal Publishing Co., Jalandhar, India.

Rizvi Syed, SAARC-Challenges Ahead, Kilaso Books, New Delhi.

S. Kindleberger, International Economics, Traveller Book Sell, New Delhi.

Elective Groups

GROUP-I (International Trade Issues & Financial Institutions)

ECO-554-India's Foreign Trade (Elective - 4 Credits)

Unit-I

12 Lectures

Trading in changing world: Views of Hicks, G. Haberler, Prebisch Singer, Cairncross, Gunnar Myrdal. Thinkers of Dependency Theory: Samir Amin, Emanuel. Agrhari, Paul Baran

Unit-II**12 Lectures**

India's Balance of Payments: Trends and Magnitude During the Plans (1951 to 1990 and 1991 Onwards). India's Foreign Trade: Composition and Direction during Plans Period. Sources and Nature of Trade Data in India. ITC (HS).

Unit-III**12 Lectures**

India's Foreign Trade Policy during Plans (1951 to 1990 and 1991 Onwards)- Institutional Infrastructure for Export Promotion, EXIM Bank, ECGC, Export Promotion Council and Boards. STC, ITPO, FTZs, SEZs, EOUs, Deemed Exports.

Unit-IV**12 Lectures**

Exchange Rate Management in India: FERA, FEMA, Issues of Full Convertibility, Use of Derivatives in Forex Management.

Reading List-

Dutt & Sundharam, Indian Economy, S. Chand & Company Pvt. Ltd., Ramnagar, New Delhi.

Economic Survey, Department of Economic Affairs, Ministry of Finance, GoI, Various Issues, General Manager, Government of India Press, Minto Road, New Delhi.

Kapila, U., India's Economic Reform, Academic Foundation, New Delhi.

Meier Gerald M., Leading Issues in Economic Development (Third Edition), Oxford University Press, New York, 1976.

Ministry of Commerce-Govt. of India, Foreign Trade Policies Yearly, Vol. I and Vol. II.

Misra & Puri, Indian Economy, Himalaya Publishing House, New Delhi.

Nair, Deepak, India's Export Potential.

Nayyar, D., Trade and Globalization, Oxford Collected Essays, Oxford University Press, New Delhi.

Stiglitz, J. E. & Charlton, A., Fair Trade for All-How Trade can Promote Development, Oxford University Press, New Delhi.

Elective Groups

GROUP-II (Agricultural & Industrial Economics) ECO-561- Economics of Agriculture (Elective - 4 Credits)

Unit I: Agriculture and Economic Development **12 Lectures**

Nature and Scope of Agricultural Economics.
Role of Agriculture in a Developing Economy.
Traditional Agriculture and its Modernization.
Theories of Agricultural Development (Lewis, Ranis and Fie, Jorgensons, Hayyami and Ruttan and Others)

Unit II : Agricultural Production and Productivity **12 lectures**

Agricultural Production: Resource Use and Efficiency,
Production Function Analysis in Agriculture,
Factor Combination and Resource Substitution,
Farm Size and Productivity Relationship Laws of Returns - Supply
Response of Individual Crops. Technical Change and Labour Absorption in Agriculture.

Unit III: Competitiveness of agriculture products and marketing.

12 lectures

Measurement of Efficiency and Competitiveness of Agricultural Products in International Markets;
Efficiency of Agricultural Markets in India; Form and Impact of Government Intervention in the Markets and Its Effects on Efficiency;
Commodity Markets: Operation and Likely Impacts. Strategies for Surviving in a Globalizing World.

Unit IV: Agriculture and the External Sector **12 Lectures**

International Trade in Agricultural commodities.
Commodity Agreements. Globalization of Indian Economy and Problems and Prospects of Indian Agriculture.
Impact of World Trade Organization on Indian Agriculture.

Elective Groups

GROUP-II (Agricultural & Industrial Economics) ECO-562- Indian Agriculture : Institutions and Issues (Elective - 4 Credits)

Unit I: India's Agricultural Development since Independence. 12 lectures

Recent Trends in Agricultural Growth in India.
Inter-Regional Variations in Growth of Output and Productivity.
Cropping Pattern Shifts.
Agricultural Policy: Price, Subsidy and Taxation.
Role of Public Investment and Capital Formation in Indian Agriculture.
Sustainable Agriculture and Food Security.

Unit II: Agricultural Finance and Credit Institutions : 12 Lectures

The Problems of Rural Indebtedness.
Importance of Institutional and Non -Institutional Finance.
Commercial Banks, RRB'S, NABARD, RBI, SHG Linkage Programme.
Rural Infrastructure Development Fund, Cooperative Credit System
Private Money Lenders. Defects of Money Lending System.
Regulation of Money Lending

Unit III: Agricultural Marketing: 12 Lectures

Introduction.
Definitions of Marketing Need for Efficient Marketing System.
Present System of Indian Agricultural Marketing.
Government Measures to Improve Indian Agricultural Marketing;

Unit IV: Major Issues in Indian Agriculture: 12 Lectures

Land Reforms and Land Policy.
Agricultural Taxation .
Under -Taxed Hypothesis in Indian Agriculture
Agricultural Prices and Price Policy.
Contract Farming; Issues in Agricultural Labour.
Crop Insurance in India.
WTO and Indian Agriculture.

Elective Groups

GROUP-II (Agricultural & Industrial Economics) ECO-563- Rural Development (Elective - 4 Credits)

- Unit I:** **12 Lectures**
Concept, Scope ,Objectives and Importance of Rural Development
Aspects of Rural Development :
Rural Infrastructure-Roads, Irrigation, Electricity, Housing, Sanitation Facilities, Communication Link, Education, Health and Family Welfare, HDI in rural India. Importance of IT in Rural India.
Rural Industrialisation and Agro- based Industries, Development of Rural Entrepreneurship.
- Unit II :** **12 Lectures**
Problems of Rural Development; Rural Unemployment.
Magnitude of the Problems, Causes and Remedies,
Status of Women and Gender bias. Women Empowerment.
Causes of Rural Migration and Solutions.
Rural Poverty, various measurements, Causes and Remedies. Problems of Inequality in Rural India.
- Unit III:** **12 Lectures**
Review of Rural Development Administration and Panchayat Raj Institutions.
The Panchayat Raj System , Functions of PR System, Sources of Income for Panchayat.
Importance of Peoples Participation , Role of Voluntary Agencies in Rural Development and Micro-Level Planning.
- Unit IV:** **12 Lectures**
Livestock Enterprises in India.
Fisheries, Sources, Fisheries Development Programme.
Animal Husbandry - Trends in Live Stock Population, Livestock Development Programmes.
Study of Floriculture and Horticulture of India and Its Potential in International Trade in the Futre.
A Brief Outline of Experiences of Rural Development in BRICS Nations.

Elective Groups

GROUP-II (Agricultural & Industrial Economics) ECO-564- Economics of Industry & Industrial Organization (Elective - 4 Credits)

Unit 1. Introduction 12 Lectures

Significance of Industrial Economics, Structure of Firms, Industrial Profile - Private Sector, Public Sector, Large, Medium & Small Scale Industries, Village Industries; Role and Problems of Industries, Liberalisation, Deregulation and Disinvestment Policy, Impact of Globalization on Industries since 1990, Industrial Integration, Industrial Combinations - Causes, Mergers & Amalgamations, Effects of Industrial Monopoly.

Unit 2 . Industrial Organization and Theories of Industrial Location and Investment Decisions: 12 Lectures

Concepts and Determinants of Market Structure, Market Conduct, and Market Performance - Interrelationships Among Structure, Conduct and Performance; Factors Influencing Location of Industries; Theories of Industrial Location; Weber, Sargent Florence; Industrial Imbalance, Causes and Measures, Herfindahl Index.

Methods of Evaluating Investment Expenditure - Social Cost Benefit Analysis - Balancing Private and Social Returns - Assessment of Financial Soundness -Sources of Finance- Ratio analysis-Sensitivity Analysis

Unit 3. Industrial Productivity & Efficiency and Problems of Selected Indian Industries 12 Lectures

Productivity - Norms and Measurement, Factors Affecting Productivity and Capacity Utilization

Importance of Productivity in the Competitive Environment, Measures Required for Improving Productivity and Efficiency.

Unit 4. Industrial Finance 12 Lectures

Meaning, Scope, Importance of Industrial Finance, Sources of Industrial Finance: Private, Public and Co-operative Sector -Shares, Debentures, Bonds, Deposits, Loan etc. Methods of Disinvestment; Foreign Capital: Need for Foreign Capital, Governments Policy towards Foreign Capital. Direct Investment, Foreign Institutional Investment, Euro Issues, GDR, ADR, External Commercial Borrowings.

Reading List :-

Alhuwalia I.J. (1985), *Industrial Growth in India*, Oxford University Press New Delhi .

Barthwal R.R. (1985), *Industrial Economics* , Wiley Eastern Ltd., New Delhi.

Cherunilam, F. (1994), *Industrial Economics : Indian Perspective* (3rd Edition), Himalaya Publishing House, Mumbai.

Desai, B. (1999), *Industrial Economics in India* (3rd Edition), Himalaya Publishing House, Mumbai.

Divine , P.J. and R.M. Jones et. al.(1976), *An Introduction to Industrial Economics*, George, Allen and Unwin Ltd., London.

Government of India , *Economic Survey* (Annual).

Hay D. and D.J. Morris (1979) *Industrial Economics Theory and Evidence*, O U P, New Delhi.

Reserve Bank of India , *Report on Currency and Finance* (Annual)

Singh, A and A.N. Sandhu (1988) , *Industrial Economics*, Himalaya Publishing House, Bombay.

Elective Groups

GROUP-II (Agricultural & Industrial Economics)

ECO-565- Industry and Development (Elective - 4 Credits)

Unit 1: Historical Development of Industry: 12 Lectures

Theoretical Perspectives of Role of Industry in Economic Development, Evolution of Industrialisation, Industrial Development during the World War Era, Contribution of Industrial Development for Ggrowth and Development Problems.

Unit 2: Globalisation and Industrial Development 12 Lectures

Modern History of Industrial Development, Technological Change Innovation and Industrial Development of Selected Nations, USA, Germany, Japan, Korea, China and Other Emerging Regions, Contribution of Industrialisation in the MDGs, Industry and Environment. WTO and Industrial Development, Inter-Linkages between Agriculture, Industry and Service Sectors.

Unit 3: Indian Industrialisation: Issues and Policies 12 Lectures

Various Models of Industrial Development in the Indian Economy Since

Independence, Debate between Public and Private Sector Economy, Alternatives for Industrial Development, Changing Approach of Industrial Policies, Industrial Finance and Credit Mechanism, Problems and Challenges of India's Industrial Development, Regional and Setoral Development of Indian Industries.

Unit 4. Industrial Relations, Industrial Disputes and Labour Problems
12 Lectures

Competition Commission of India and Regulation of Indian Industries, Industrial Disputes, Reasons and Remedies, Labour Unions and Labour Related Issues for Indian Industries, Social Security Measures for Industrial labour, Industrial sickness, Exit Policy, Legal Provisions and Government Policies.

Reading List :

Literature from Government of India, WTO, UNIDO, World Bank etc.

Elective Groups

GROUP-II (Agricultural & Industrial Economics)
ECO-566- Economics of Infrastructure & Transport
(Elective - 4 Credits)

Unit 1: Introduction to Infrastructure Economics: 12 Lectures
Infrastructure and Economic Development - Infrastructure as a Public Good; Social and Physical infrastructure; Special Characteristics of Public Utilities. The Peak Load, Off Load Problem, Dual Principle Controversy; Economics of Scale of Joint Supply; Marginal Cost Pricing vs. Other Methods of Pricing in Public Utilities; Cross Subsidization, Free Prices, Equity and Efficiency. Role of the State in Infrastructure Provision - Need for Regulation in Present Period - Public Private Partnership. Planning for Infrastructure: The Development of Social and Physical Infrastructure Planning; Planning at Aggregate and Disaggregate Levels: Integrating Infrastructure Planning with the Large Planning Framework Exercise Infrastructure Planning in India - Process, Implementation and Experience.

Unit II: Transport Economics: 12 Lectures
Characteristics of Demand and Supply in Transport Sector - The Structure of

Transport Costs. Models of Freight and Passenger Demand. Principles of Pricing. Special Problems of Individuals Modes of Transport; Inter-Modal Condition in the Indian Situation - Location of Economic Activities. Indian Railways: Its Economics, Government Policies and Problems. Road, Water and Air Transport: Significance and Growth, Problems and Policy Challenges, Privatization and Modernization Issues. Review of Selected Important Schemes of Rural and Urban Transportation in India.

Unit III: Energy, Electricity and Gas and Water Supply Economics
12 Lectures

Energy Economics-Primacy of Energy in the Process of Economic Development. Factors Determining Energy Demand. Effects of Energy Shortages. Energy conservation. Renewable and Non-conventional Sources of Energy. Pricing Issues in Energy, Electricity, Gas and Water Supply. Challenges in the Provision of Services by the Public and Private Sector.

Unit IV: Infrastructure Financing and Regulation: 12 Lectures

Conventional Methods of Financing Infrastructure - Scope for Private Financing of Infrastructure - Reforms in Financing - Theory of Regulation, Deregulation and Privatization in Infrastructure. Approaches to Privatization of Infrastructure and Services and a Competition Policy-Evolution of Infrastructure Policy in India with Focus on Case Studies Regarding Different Modes. Regulatory Bodies for Infrastructure.

Reading List :-

Boyle, G. . Renewable Energy 1996, Power for a Sustainable Future, Oxford University Press.

Indian Council of Social Sciences Research (ICSSR) (1976), Economics of Infrastructure, Vol. VI, New Delhi.

L N Dash (2008), Infrastructure Development and the Indian Economy, Regal Publications.

National Council of Applied Economic Research (NCAER) (1996), India Infrastructure Report; Policy Implications for Growth and Welfare, NCAER, New Delhi.

World Bank (1994): Infrastructure for Development, World Development Report, Washington D.C.

3 I Network: India Infrastructure Report, Delhi, OUP, Various Issues.

Elective Groups

GROUP-III (Development Economics)

ECO-571- Population Studies (Elective - 4 Credits)

UNIT-I: Theories of Populations- I

12 Lectures

An Overview of Pre- Malthusian and Malthusian Theory of Population..
Theory of Optimum Population
Biological Theories of Population : Thomas Doubleday's Diet Theory, Joe De Castro's Protein Consumption Theory, Michael Thomas Sadler's Destiny Theory, Pearl and Reed's Logistic Curve Theory and Corrado Ginniss Biological Population Theory.

UNIT-II: Theories of Population - II

14 Lectures

Social and Economic Theories of Population : Dumont's Theory of Social Capillarity, Karl Marx's Theory of Surplus Population, Leibenstein's Motivational Theory of Population Growth.
Demographic Transition Theory : Notestein, Blacker, Karl Sax, Landry, Cowgill, Coale and Hoover
Population and Economic Development : Enke's View, Meadows View, Julien Simmon View, Leibenstein Critical Minimum Effort Theory.
Population and Environment

UNIT-III: Indian Population Analysis

10 Lectures

Indian Population: Composition, Structure, Pattern etc.
Determinants and Pattern of Fertility in India.
Determinants of Pattern of Mortality and Morbidity in India.
Age at Marriage in India
Population Policy in India with a Comparative Analysis of Some Developing Countries.

UNIT-IV: Migration And Urbanization

12 Lectures

Migration: Concepts, Measurement and Selectivity.
Theories of Migration : Everett Lee's Theory of Migration, Duncan's Theory, Standing's Theory of Materialism.
Models of Migration :, Lewis Model of Rural-Urban Migration, The Fei-Renis Model of Rural-Urban Migration, Harris- Todaro Model of Rural-Urban Migration.
Urbanization in India
Urbanization and Civic Amenities

Elective Groups

GROUP-III (Development Economics) ECO-572- Demography (Elective - 4 Credits)

UNIT-I: Demography I 12 Lectures

Demography : Definitions, Concepts, Rates, Ratio & Proportions etc.
Fertility and Fecundity and its various Measurements :
CBR, ASFR, GFR, TFR, GRR, NRR, Cohort Rates and Coale Indices.

UNIT-II: Demography II 14 Lectures

Mortality and Morbidity and its various Measurements: CDR, IMR, NMR, MMR etc. Measures of Morbidity.
Life Table : Simple and Abridged Life Table and Construction of Life Table, Model Life-Table : U.N. Model Life Table and Coale - Demeny Model Life Tables.

UNIT-III: Nuptiality Analysis and Stabilization Model 12 Lectures

Nuptiality Analysis: Concepts and Measurement.
Population Projections.
Age-Pyramid : Views of Thompson and Lewis.
Demographic Models : Stable and Stationary Population Model..

UNIT-IV: Demographic Data 10 Lectures

Sources of Demographic Data: Census, Sampling, Vital Registration Methods, NFHS/SRS and DHS.
Food and Nutrition Position in India
Quality of Data: Whipple's Index, Myers and Blended Index.
Trends of World Population: with special focus on SAARC & BRICS Nations.

Reading List :

Becker, G. (1960) , An Economic Analysis of Fertility in Demographic Change and Economic Change in Developed Countries (edited by National Bureau of Economic Research), Princeton University Press, Princeton.
Boserup, E. (1981) , Population and Technological Change. A Study of Long Term Trends Chicago, University of Chicago Press.
Chandna, R. C. (2008), A Geography of Population Concepts, Determinants and Patterns

- Bouge, D. J. (1971), Principles of Demography, John Wiley, New York.
- Coale, A. and E. Hoover (1958), Population Growth and Economic Development in Low Income Countries, A Case Study of India's Prospects, Princeton University Press, Princeton.
- Cox, Peter R. (1979), Demography, Vikas Publishing House, New Delhi.
- John R. Weeks (2002), Population : An Introduction to Concepts and Issues (7th Edition), Wadsworth Publishing Company, New York.
- Shryock, H. S. et. al. (1976), The Methods and Materials of Demography, Academic Press, New York.
- Srinivasan, K. (1998), Basic Demographic Techniques and Applications, Sage Publications, New Delhi.
- Schultz, Theodore W. (1978), Investing in People; The Economics of Population Quality, Hindustan Publishing Corporation, India, Delhi.
- Thompson, W. S. and Lewis, D.T. (1976), Population Problems, Tata McGraw Hills Publishing Co., New Delhi.

Elective Groups

GROUP-III (Development Economics)

ECO-573- Economics of Education and Health

(Elective - 4 Credits)

Unit 1:

12 Lectures

Human Capital - Concept & Components, Historical Developments in the Human Capital Theory, Human Capital vs. Physical Capital, Human Capital and Human Development.

Definition and Scope of Economics of Education and Health, Education & Health as Consumption and Investment Goods, Education and Health as an Instrument of Economic Development, Eradication of Poverty, Unemployment and Inequality in Income Distribution, Education - Health as joint venture

Unit 2:

12 Lectures

Cost-Benefit Analysis in Education, Problems in the Measurement of Costs and Benefits in Education

Demand and Supply of Education, Educational Planning in Developing

Countries with Special Reference to India, Educational Planning and the Problem of Educated Unemployment and Brain Drain, An Overview of Education Policies in India

Unit 3:

12 Lectures

The Concept and Determinants of Health Care, Health, Poverty and Malnutrition, Health Care System and Infrastructure in India, Institutional Issues in Health Care Delivery

Demand and Supply of Health Care, Health Planning and Management in Developing Countries with Special Reference to India, Resource Mobilization and Utilization of Health Care in India, An Overview of Health Policies in India

Unit 4:

12 Lectures

Financing of Education and Health Programmes in India; Resource constraints, Expenditure on Health and Education during Post Reform Period, Pricing and Subsidies to Health and Education Sector, Inequalities in Health Care and Educational Attainment in India, A Brief Introduction of Surveys for Health and Education in India - DIES, NFHS

Implication of GATS for Education and Health Sector, Role of International Organizations- UNDP, WHO.

Reading List:

Anthony J. Cuyler and Joseph P.(ed) (2000), Handbook of Health Economics, Newhouse, North-Holland, Elsevier Science.

Blaug, Mark (1972) Introduction to Economics of Education. Penguin, London.

Becker, G.S.(1974) Human Capital. 2nd Edn., NBER, New York

Becker, Gray S. (1998), Human Capital and Poverty, Religion and Liberty Archive, Chicago, University of Chicago Press.

Behrman, Jere R. (1990), Human Resource Led Development, Review of Issues and Development, New Delhi, India: ARTEP/ILO.

Berman, P and M.E.Khan (1989), Paying for India's Health Care. Sage Publications, New Delhi.

Cohn, E and T.Gaske (1989), Economics of Education, Pergamon Press, London.

Carrin, G. and C. Politi (1997), Poverty and Health: An Overview of the Basic Linkages and Public Policy Measures, Health Economics Technical Briefing Note, Task Force on Health Economics, WHO, Geneva, 38 PP.

Clewar, Ann, and David Perkins. 1998, Economics for Health Care Management. London: Prentice Hall.

Education for Development

Folland, Sherman, Allen Goodman, and Miron Stano. 2001. The Economics of Health and Health Care. New York: Macmillan, Third Edition.

Klarman, H.E. (1965), Economics of Health, Columbia University Press, New York.

Panchamukhi, P.R.(1980), Economics of Health: A Trend Report, ICSSR Survey, Allied, New Delhi.

Rice, Thomas. 1998, The Economics of Health Reconsidered. Chicago: Health Administration Press.

Tilak. J.E.G.(1989), Economics of Inequality in Education, Sage, New Delhi.

World Bank (1983), The World Development Report: Investing in Health, Oxford University Press, New York.

Elective Groups

GROUP-III (Development Economics)

ECO-574- Social Sector and Development Issues (Elective - 4 Credits)

Unit 1:

12 Lectures

Alternative Concepts of Economic Development: Income-Based Approach and Capability-Based Approach, Measurement Issues for Development - Human Development Index, Physical Quality of Life Index, Human Poverty Index, Gender Development Index, Multidimensional Poverty Index, Multi-dimensional Measures of Well Being, Development Experiences of Less Developed Countries in the Recent Past.

Social Sector - Concept and Issues, Role of Social Sector in Economic Development

Unit 2:

12 Lectures

Poverty, Inequality and Income Distribution - Conceptual, Measurement & Identification Issues, Functional Effects & Issues (Kuznet's Inverted U-Hypothesis), Inequality as Constraint to Growth, Poverty and Under-

Nutrition, Poverty as Capability Deprivation
Planning & Strategies to Eradication of Poverty, Inequality in Income Distribution for Developing Economies with Special Reference to India, An Overview of Poverty Eradication Policies in India

Unit 3:

12 Lectures

Unemployment and Migration - Concept, Measurement & Types, Linkages Between Unemployment and Poverty, Migration - Problem or Solution, Rural - Urban Wage Gap, Labour Market Discrimination, Informal Sector - Determinants of its Size, Linkage with Rest of Economy
Planning & Strategies to Eradicate Unemployment for Developing Economies with Special Reference to India, An overview of Unemployment Eradication Policies in India

Unit 4:

12 Lectures

Social Infrastructure and Development - Concept & Identification Issues, Social Infrastructure Development in India - Health, Education, Drinking Water, Sanitation, Housing, Food Security, Social Security Schemes and Policies in India, Crime and Violence as an Obstacle in the Path of Development

Reading List:-

A Banerjee, R Benabou and D Mookherjee (ed), Understanding Poverty, OUP

Amit Bhaduri: Employment and Development, OUP

Basu, Majumdar and Mitra (ed), Capital, Investment and Development, Essays in memory of Sukhamoy Chakravarty, OUP

D Lal, The Poverty of Development Economics, OUP

Francise Stewart, Technology and Under-development

G Meier, Leading Issues in Economic Development (2nd, 3rd and 4th Editions), OUP.

Ha-Joon Chang: Rethinking Development Economics, Anthem Press

Kaushik Basu, Analytical Development Economics, The Less Developed Economy Revisited, OUP

Kaushik Basu, The Less Developed Economy, A Critique of Contemporary

Theory, OUP

Meier and Rauch, Leading Issues in Economic Development (8th Editions), OUP

P.Dasgupta, In Inquiry into Well Being and Destitution, OUP

P Svendberg, Poverty and Undernutrition, OUP

R Skarstein, Development Theory- A Guide to Some Unfashionable Perspectives, OUP.

R T Gill, Economic Development: Past and Present (3rd Edition), Prentice Hall of India.

Sen Amartya, Employment, Technology and Development, OUP

Sen Amartya, Development as Freedom, OUP

Sen Amartya, Poverty and Famine, Essay on Entitlement, OUP.

S Mehrotra and E Delamonica, Eliminating Human Poverty, Orient Longman.

T Addison, D Hulme and R Kanbur (ed): Poverty Dynamics, Interdisciplinary Perspective, OUP

Elective Groups

GROUP-III (Development Economics)

ECO-575- Gender Economics (Elective - 4 Credits)

Unit- I: Basics of Gender Studies

12 Lectures

Importance and Concepts of Women Studies, Economic Basis and Functioning of Patriarchy in Developed and LDCs, Particularly India; Gender bias in the Theories of Value, Distribution and Population.

Demography of Female Population: Age Structure, Mortality Rates, and Sex Ratio- Causes of Declining Sex Ratios and Fertility Rates, Women and their Access to Nutrition, Health, Education and Social Community Resources.

Unit- II: Work & Decision- Making

12 Lectures

Concept of Women's Work, Valuation of Productive and Unproductive Work, Visible and Invisible Work, Paid and Unpaid Work, Economically Productive and Socially Productive Work, Female contribution to National Income. Factors Affecting Decision Making by Women, Property Rights, Access to and Control over Economic Resources, Assets. Power of Decision Making at

Household & Community Level, Economic Status of Women with Reference to Work- Participation, Income, Health and Education.

Unit- III: Women, Labour Market & Technology **12 Lectures**

Factors Affecting Female Entry in Labour Market, Supply and Demand for Female Labour. Female Work Participation in Agriculture, Non- Agriculture Rural Activities, Informal Sector, Cottage and Small- Scale Industries, Organized Industry and Services Sector. Wage Differential and their Determinants in Female Activities.

Impact of Technological Development and Modernization on Women's Work Participation - Agriculture, Non- Agriculture Rural Activities, Small and Cottage Industries, Formal and Informal Sectors. Role of New Technology for Women Empowerment-Call Centres, BPO,KPO, Telemarketing etc.

Unit IV: Gender Planning and Social Security **12 Lectures**

Gender and Development Indices, Mainstreaming Gender into Development Policies, Gender- Planning Techniques, Gender Budgeting, Gender Sensitive Governance.

Social Security of Women: Entitlements, Access to Credit and Insurance Markets. Role of Voluntary Organizations & Self Help Groups in Providing Social Security, Schemes for Safety Net for Women in India, Affirmative Action for Women and Improvement in their Economic and Social Status.

Reading List :-

Ahmed, I. (Ed.) (1985), Technology and Rural Women: Conceptual and Empirical Issues, George Allen & Unwin, London.

Agnihotri, S. B. (2000), Sex ratio in Indian Population: A Fresh Exploration, Sage Publications, New Delhi.

Amsden, A. H. (Ed.) (1980), The Economics of Women and Work, Penguin, Harmondsworth.

Boserup E. (1970), Women's Role in Economic Development, George Allen and Unwin, London.

Buvinic M. and M.A. Lycette (1989), 'Women, Poverty and Development in the Third World', in Lewis J.P. (Ed.), Strengthening the Poor: What Have We Learnt, OECD.

Dantwala, M.L., H. Sethi and P. Visaria (1998), Social Change Through Voluntary Action, Sage Publication, New Delhi.

Government of India (1974), Towards Equality- Report of the Committee on the Status of Women in India, Department of Social Welfare, Ministry of Education and Social Welfare, New Delhi.

Gulati, S. C. (1998), Fertility in India: An Econometric Analysis of a Metropolis, Sage Publications, New Delhi.

Jhabwala, R. and R.K. Subramanya (2000) (Eds.), The Unorganized Sector: Work Security and Social Protection, Sage Publications, New Delhi.

Krishnaraj, M, R.M. Sudarshan and A. Shariff (1999), Gender, Population and Development, Oxford University Press, New Delhi.

MHRD, GOI (1987), Shram Shakti: Report of the National Commission on Self-employed Women and Women Workers in the Informal Sector, Ministry of Human Resource Development, New Delhi.

Narasimhan, S. (1999), Empowering Women: An Alternative Strategy from Rural India, Sage Publications, New Delhi.

Papola, T.S. and A.N. Sharma (Eds.) (1999), Gender and Employment in India, Vikas Publishing House New Delhi.

Redcliff, N. and E. Mingione, (Eds.) (1985), Beyond Employment : Household, Gender and Subsistence, Basil Blackwell, Oxford.

Schultz, T.P. (1988), 'Education Investments and Returns' in Chenery, H.B. and T.N. Srinivasan, The Handbook of Development Economies, North Holland, New York.

Seth. M. (2000), Women and Development : The Indian Experience, Sage Publication, New Delhi.

Sinha. A. K. (2008), New Dimensions of Women Empowerment, Deep & Deep Publications Pvt .Ltd, New Delhi.

Srinivasan, K. (1998), Basic Demographic Techniques and Applications, Sage Publications, New Delhi.

Wazir, R. (2000), The Gender Gap in Basic Education: NGOs as Change Agents, Sage Publications, New Delhi.

Elective Groups

GROUP-IV (Public Policy)

ECO-581- Public Economics (Elective - 4 Credits)

UNIT -I

12 Lectures

Introduction

Public Economics - Concepts
Evolutions of Fiscal Policy for Economic Development, Growth and Stabilization
Counter Cyclical Expenditure
Compensatory Finance
Fiscal Dynamics and Growth

UNIT -II

12 Lectures

Tax & Expenditure

Tax and Expenditure - Structure & Pattern
Direct and Indirect Taxes
Taxes of Union, State and Local Bodies
Tax Reforms
Expenditure Reforms
Tax Administration Reforms

UNIT-III

12 Lectures

Budget System

Process of Budget Formulation & Enactment
Components of Budget
Types of Deficits & Effects of Deficits
FRBM Act
Fiscal Consolidation

UNIT-IV

12 Lectures

Federal Finance

Fiscal Federalism
Co-operative Federation
Centre -State Financial Relations
Finance Commissions
State Finance Commissions
Financial System of Local Bodies

Reading List :

Atkinson A. B., and Stiglitz J. E. (1980), Lectures on Public Economics, Tata McGraw Hill, New York.

Buchanan, J.M. (1970), The Public Finances, Richard D. Irwin, Homewood.

Chelliah Raja J. (1971), Fiscal Policy in Underdeveloped Countries, George Allen and Unwin, London.

Dalton, Hume (1971), Principles of Public Finance, Routledge and Kegan Paul Ltd., London.

Jha, R. (1998), Modern Public Economics, Routledge, London.

Lakdawala, D. T. (1967), Union-State Financial Relations, Lalvani Publishing House, Bombay.

Lekhi, R. K., Public Finance, Kalyani Publishers, Ludhiana.

Musgrave R. V. and Musgrave P.B. (2001), Public Finance in Theory and Practice, McGraw Hill Book Company, New Delhi.

Singh, S. K., Public Finance in Theory and Practice, S. Chand and Co. Ltd., New Delhi

Elective Groups

GROUP-IV (Public Policy)

ECO-582- Resource & Energy Economics (Elective - 4 Credits)

UNIT-I**12 Lectures****Natural Resources**

Types & Classification of Natural Resources

Measurement of Natural Resources

Management and Conservation of Natural Resources

UNIT-II**12 Lectures****Natural Resource Scarcity**

Factors of Resource Scarcity

Detection & Indicators of Resource Scarcity

Evidence of Resource Scarcity

UNIT -III**12 Lectures****Energy : Introduction & Background**

Review of the Basics of Supply, Demand & Price Formation in Competitive Markets

Energy Demand : Short Run and Long Run Price and Income Elasticities
Energy Supply & Economics of Depletable Resources.

UNIT -IV

12 Lectures

Energy Security

World Oil Market & Energy Security
Risk Management, Future Market & Derivatives
Energy Efficiency Policies

Reading List :

Bhattacharya, S. (2011), Energy Economics : Concepts, Issues, Market & Governance, Springer Verlag Limited, London.

Deffeyes, K. (2001), Hubbert Peak : The Impending World of Oil Shortage, Princeton, N.J. Princeton University Press.

Hotelling, H. (1931), The Economics of Exhaustible Resources.

Pindyck, R., and D. Rubinfeld, Microeconomics, Prentice Hall, 2005.

Tietenberg, Tom (2004), Environmental & Natural Resource Economics, Pearson Education, Singapore.

Elective Groups

GROUP-IV (Public Policy)

ECO-583- Environmental Economics (Elective - 4 Credits)

UNIT-I

10 Lectures

Introduction

Environmental Economics - Concept and Dimensions
Links between Natural Environment and Human Economy
Neo-classical Perspective: Circular Flow Model
Ecological Perspective: Material Balance Model

UNIT-II

14 Lectures

Fundamentals of Environmental Resources and Environmental Problems

The Economic Process and the Assimilative Capacity of the Natural Environment
The Optimal Level of Pollution
Environmental Damage

Public Goods

Common Property Resources

Externalities: Types of Externalities, Basics of Externality Theory.

UNIT-III

14 Lectures

Solution to Environmental Problems

Command-and-Control Approach : Liability Law, Emission Standard, Property Rights.

Market approach: Pollution Tax, Pollution Subsidy, Deposit/ Refund System, Pollution Permit Trading System.

The Economic Approach to Environmental Valuation

Direct and Indirect Methods: Market Pricing Approach, Replacement Cost Approach, Hedonic Pricing Approach, Household Production Function Approach, and Contingent Valuation Approach.

Benefit -Cost Analysis.

UNIT-IV

10 Lectures

Environment and Development

Environmental Kuznets Curve

Sustainable Development -Conceptual Framework

Indicators of Sustainable Development

Environmental Accounting

Reading List :-

Baumol, W.J & Wallace, E.O. : The Theory of Environmental Policy, Prentice Hall, New Jersey

Bhattacharya, Rabindra N (ed.) : Environmental Economics -An Indian Perspective, Oxford University Press, New Delhi

Eugene, T , Environmental Economics, Vrinda Publishers, New Delhi

Hanley, Nick; Shorgen, Jason F. & White, Ben: Environmental Economics- In Theory & Policy , Macmillan, New Delhi

Hussen, Ahmad M , Principles of Environmental Economics, Routledge, London

Jhingan, M L. & Sharma, C.K. , Environmental Economics -Theory, Management & Policy, Vrinda Publishers, New Delhi

Karpagam, M, Environmental Economics, Sterling Publishers, New Delhi

Kolstad, Charles D., Environmental Economics, Oxford University Press, New Delhi

Mohanty, S. K , Environmental and Pollution Laws, Universal Law Publishers Co., New Delhi

Rangarajan, Mahesh , Environmental Issues in India, Pearson Longman, New Delhi

Sankar, Ulagnathan, Environmental Economics, Oxford University Press, New Delhi

Sengupta, Ramprasad , Ecology & Economics, Oxford University Press, New Delhi

Singh, Katar & Shishodia, Anil , Environmental Economics -Theory and Application, Sage Publication, New Delhi

Speth, J. G. & Haas, P.H , Global Environmental Governance, Pearson Longman, New Delhi

Thomas & Callan , Environmental Economics, Thomson South-Western, New Delhi

Tietenberg, Tom, Environmental and Natural Resource Economics, Pearson Education, New Delhi.

Elective Groups

GROUP-IV (Public Policy)

ECO-584- Environmental Issues & Institutions (Elective - 4 Credits)

UNIT -I

12 Lectures

Environmental Issues and Challenges

Domestic Environmental Issues

Air, Water and Soil Pollution

Natural Resource Depletion

Deforestation

Global Environmental Issues

Global Warming

Greenhouse Gas Emissions

Ozone Depletion

Climate Change

UNIT -II

14 Lectures

Global Environmental Institution and Summits

International Union for Conservation of Nature

United Nations Environment Programme

United Nations Framework Convention on Climate Change

UN Conferences on Human Environment

UN Conferences on Sustainable Development

World Commission on Environment and Development

Major Environmental Institutions and Reports

A Brief Outline of Important Conventions - Ramsar Convention on Wetlands,

UN Convention to Combat Desertification, Rotterdam Convention on

Hazardous Chemicals and Pesticides in International Trade Stockholm

Convention on Persistent Organic Pollutant, Nagoya Protocol on Biological

Diversity, Cartagena Protocol on Bio-safety.

A Brief Outline of - Agenda 21, Clean Development Mechanism,
Environment Performance Index & Green Climate Fund

UNIT-III

12 Lectures

India's Environmental Institutional Structure

Ministry of Environment, Forests and Climate Change

Central Pollution Control Board

State Pollution Control Board

Pollution Control Unit

National Green Tribunal

National Ganga River Basin Authority

UNIT-IV

10 Lectures

Environmental Policy in India

Environmental Laws in India

National Environmental Policy

State Environmental Policy

National Action Plan of Climate Change

Environmental Initiatives in India

Reading List :

Mohanty, S. K , Environmental and Pollution Laws, Universal Law
Publishers Co., New Delhi

Sankar, Ulagnathan , Environmental Economics, Oxford University Press,

New Delhi

Speth, J. G. & Haas, P.H , Global Environmental Governance, Pearson
Longman, New Delhi

Elective Groups

GROUP-IV (Public Policy)

ECO-585- Economics and Law (Elective - 4 Credits)

UNIT-I

12 Lectures

Land, Agricultural and Industrial Law

Land Acquisition Act, 1894 & Amendments

Agriculture Produce Marketing Committee Acts

Consumer Protection Act, 1986

M.R.T.P. Act, 1969

Competition Act, 2002

UNIT-II

12 Lectures

Financial Sector

RBI Act, 1934

Banking Regulation Act, 1949

Companies Act, 1956

Income Tax Act, 1961

SEBI Act, 1992

IRDA Act, 1999

FRBM Act, 2003

UNIT -III

12 Lectures

Environmental Law

The Environmental (Protection) Act, 1986

The Hazardous Wastes (Management and Handling) Rules, 1989

The Noise Pollution (Regulation and Control) Rules, 2000

The Water (Prevention and Control of Pollution) Act, 1974

The Air (Prevention and Control of Pollution) Act, 1981

The National Environmental Tribunal Act, 1995

The Forest (Conservation) Act, 1980

The Wild Life (Protection) Act, 1972

UNIT -IV

12 Lectures

Intellectual Property Law

Indian Copyright Act, 1957

Indian Patent Act, 1970

Industrial Design Act, 1996

Geographical Indication of Goods (Regulation and Protection) Act, 1999

Trade Mark Act, 1999

Elective Groups

GROUP-V (Quantitative Economics)

ECO-591- Advanced Econometrics (Elective - 4 Credits)

Unit-I

12 Lectures

Theory of Estimation: Different Methods of Estimation, Characteristics of Estimators in Both Small and Large Sampling; Gauss Markov Theorem, Confidence Interval and Confidence Limits of Parameter Estimates of OLS and Generalized OLS Linear Regression Model, Explanation of R² and Adjusted R-2.

Unit-II

14 Lectures

Econometric Problems in Regression Analysis

- A. Autocorrelation: Nature, Identification, Consequences and Remedial Steps for Autocorrelation Problems.
- B. Heteroscedasticity: Nature, Identification, Consequences and Remedial Steps for Heteroscedasticity Problems.
- C. Multicollinearity: Nature, Identification, Consequences and Remedial Steps.
- D. Micronumerocity: Identification and Multicollinearity.

Unit-III

12 Lectures

- A. Specification of Errors; Errors of Measurement; Dummy Variables and Regressions using Dummy Variables.
- B. Lag in Economic Relationship: Estimation of Single Regression Equation with Lags & Distributed Lag Models.

Unit-IV

10 Lectures

Probit Models, Logit Models, Tobit Models & ARCH Models.

Reading List :-

Baltagi, B.H., *Econometrics*.

Chow, G.C., *Econometrics*.

Dhrymes, P.J., *Econometrics Statistical Foundations and Applications*.

Dongherty, C., *Introduction to Econometrics*.

Goldberger, A.S., *Introductory Econometrics*.

Gujarati, D. N. (1995), *Basic Econometrics (IInd Edition)*, New Delhi, McGraw-Hill.

Greene W.H., *Econometric Analysis*, 4th edition, Pearson Education (2000)

Hamonda, O.F. and J.C.R. Roley: *Time Series Model, Causality and Exogeneity*

Intrilligator, M.D., *Econometric Methods, Techniques and Applications*.

Intrilligator, M.D., *Econometric Methods, Techniques and Applications*.

J. Johnston, *Econometric Methods*, 3rd Edition, McGraw-Hill/Irwin; 4th edition (1996)

Klein, L.R., *Introduction to Econometrics*. Mehta P. C. And Madnani G.M. K., *Econometrics*, Latest Edition.

Koutsoyiannis, A. (1997), *Theory of Econometrics (IInd Edition)*, London, the Macmillan Press.

Krishna, K. L., (1997), *Econometric Applications in India*, New Delhi, Oxford University Press.

Kamenta, J. (1997), *Elements of Econometrics*, New York, University of Michigan Press.

Maddala, G.S. (Ed.) (1993), *Econometrics Method and Applications*, (2 vols.) U. K.; Alders Hot.

Sen, A., *Poverty: An Ordinal Approach to Measurement*, *Econometrica*.

Theil, H., *Introduction to Econometrics*.

Theil. H., *Principles of Econometrics*.

Elective Groups

GROUP-V (Quantitative Economics)

ECO-592- Time Series Analysis & Computer Application

(Elective - 4 Credits)

Unit-I

12 Lectures

Time Series Econometrics: Pooling of Time Series and Cross Sectional Data: Panel Data, Difference Between Time Series Analysis and Time Series Econometrics. Tests of Stationarity of Time Series, Unit Root Test, Tests of Causality; Transforming Non-Stationary Time Series Cointegration; Regression of a Unit Root Time Series on Another Unit Root Time Series; Some Economic Application.

Unit-II

14 Lectures

Simultaneous Equation Model: Problems of Estimation of Parameters of Simultaneous Equation Model. Identification Problems: Rank and Order Condition for Identification, Indirect Least Squares Method of Estimation. Instrumental Variables, Two Stage Least Squares Methods of Estimation, Three Stage Least Squares Methods of Estimation.

Maximum Likelihood Estimation Method: Full Information Method, Partial Information Method.

Unit-III

10 Lectures

Basic of Computer and Languages, MS-Excel, SPSS, e-views.

Unit-IV

12 Lectures

Methods for Estimation of Demand, Supply, Production, Consumption and Cost Functions based on Computer Application.

References:

Computer language and operating systems.

Enders, Time series Econometrics

Gujarati, D. N. (1995), Basic Econometrics (IInd Edition), New Delhi, MCGraw-Hill.

Henderson, J.M. and Quandt, R.E., Microeconomic Theory: A Mathematical

Approach.

Intrilligator, M.D., *Econometric Methods, Techniques and Applications*.

Intrilligator, M.D., *Econometric Methods, Techniques and Applications*.

Johnston, J., *Econometric Methods*.

Johnston and Dinardo, *Econometrics*

Koutsoyiannis, A. (1997), *Theory of Econometrics (IInd Edition)*, London, the Macmillan Press.

Krishna, K. L., (1997), *Econometric Applications in India*, New Delhi, Oxford University Press.

Kamenta, J. (1997), *Elements of Econometrics*, New York, University of Michigan Press.

Klein, L.R., *Introduction to Econometrics*.

Lange, Oscar, *Introduction to Econometrics*.

Maddala, G.S. (Ed.) (1993), *Econometrics Method and Applications*, (2 vols.) U. K.; Alders Hot.

Mehta, B.C., *Mathematical Economics: Microeconomic Models*.

Manual book on SPSS for computer applications.

Manual book on MS-Excel.

Manual book of e-views.

Nachane, Dilip M.; *Econometrics*.

Theil, H., *Introduction to Econometrics*.

Theil, H., *Principles of Econometrics*

Elective Groups

GROUP-V (Quantitative Economics)

ECO-593- Financial Econometrics (Elective - 4 Credits)

Unit-I

12 Lectures

Basic Financial Terms, Concepts and Their Evaluation: Financial Securities- Zero Coupon Bond, Fixed Interest, Index Linked Securities etc.; The Time Value of Money; Nominal Vs. Real Interest, Deflationary Conditions; Accumulating Factors, Force of Interest, Compound Interest Functions; Time

Series Econometrics and Time Series Analysis and Their Application.

Stationary Time Series Model: Autocorrelation and Partial Autocorrelation, Auto Regressive and Moving Average Models, Conditions for Stationary and Invertible Process, Box-Jenkins Approach, Forecasting, Permanent Versus Temporary Abruption, Simple Exponential Smoothing and Choice of Parameter, Seasonal Models with Trend, Seasonal Decomposition; Test of Causality- G.C. Test.

Unit-II

14 Lectures

Nonstationary Time Series and Volatility: Integrated Process and Random Walk, Engle Granger Method and Johansen Test, Error Correction Model, Vector Auto Regressive Model, Impulse Response Function, Variance Decomposition, Forecasting; Volatility Clustering, Leverage Effect, ARCH Model, GARCH Model and its Various Extension, Multivariate GARCH Modeling, Forecasting.

Annuities and Equation of Value: Discounting and Accumulation: Discrete and Continuous Cash Flows; Level Annuities, Deferred and Increasing/Decreasing Annuities, Equation of Value and Yield on Transaction, Probability of Cash Flows, Higher Discount, Loan Schedules; Consumer Credit: Flat Rate and APRs.

Unit-III

10 Lectures

Capital Budgeting Techniques and Compound Interest Problems: Introduction to Financial Statement, Assessing Financial Performance, Net Present Value, Internal Rate of Return, Payback Period; Projects with Different Lives; Money and Time Weighed Rate of Return; Fixed Interest Securities, Uncertain Income Securities, Equities, Valuing a loan with Allowance for Capital Gains and indexation.

Unit-IV

12 Lectures

Arbitrage, Forward Contracts, and Term Structure of Interest: Rationale for no Arbitrage Assumption; Forward Contracts, Calculating the Forward Price for a Security with known dividend yield; Hedging, Fixed Cash Income; Discrete Time and Continuous Time Rates; Continuous Time Spot Rates and Forward Rates; Instantaneous Forward Rates; Term Structure of Interest Rates; Yield Curve; Yields to Maturity; Convexity and Immunization; Interest Rate Risk. Government Bills: Corporate Debt, Debentures, Unsecured Loan Stocks,

Eurobonds, Certificates of Deposit, Convertibles, Property, Derivatives, Future, Range of Futures, Clearing House, Margin, Bond Futures, Short Interest Futures, Stock Index Futures etc.

Reading List:

Coelli, T., D.S. Prasada Rao, and G. E. Battese, *An Introduction to Efficiency and Productivity Analysis*, Kluwer Academic Publishers, 1997.

Baxter, M. and A. L. Rennie, *Financial Calculus*, Cambridge University Press, 1996.

Enders, W., *Applied Econometric Time Series*, second edition, John Wiley and Sons, 2006.

Greene, W.H. *Econometric Analysis*, fifth edition, Pearson Education Inc., 2003

Hamilton, J. D., *Time Series Analysis*, Princeton University Press, 1994

Karatzas, L. and S.E. Shreve, *Methods of Mathematical Finance*, Springer, 1998.

Martin, P.G. and B.Michael, *Applied Financial Mathematics*, Prentice Hall, 1991.

Ross, S.M., *An Introduction to Mathematical Finance*, Cambridge University Press, Norton, London, 1999

Watsham, T.J. and Perramone, K., *Quantitative Methods in Finance*, International Thomson Business Press, 1997

Wooldridge, J. M., *Econometric Analysis of Cross Section and Panel Data*, MIT Press, 2001

Elective Groups

GROUP-V (Quantitative Economics)

ECO-594- Linear Economics (Elective - 4 Credits)

Unit-I

12 Lectures

Linear Economics: Meaning and Constraints of Linear Economics, Importance of Linear Economics.

Tools of Linear Economics:

A. Determinants: Types of Determinants, Minor, Co-factors and Other Operations of Determinants.

B. Matrices: Types of Matrices, Other Operations of Matrices Namely Addition, Subtraction, Multiplication, and Division, Transpose, Rank and Inverse of Matrices.

Unit-II

12 Lectures

Linear Simultaneous Equation System; Conversion of Linear Simultaneous Equation into Matrix Form; Solution of Linear Simultaneous Equation System via Determinants and Matrix Method; Linear Supply Model, Linear Cost Model, Linear Saving Model, Linear Investment Model and Linear Inventory Model etc. based on more than one Explanatory Variables.

Problems of Simultaneous Equations Model ;

(a) Related to Identification

(b) Related to Estimation

(c) Structural Models; Reduced form Model & Recursive Models, Difference their Conversions

Unit-III

10 Lectures

Input-Output Model: Basic Features and Types, Open and Closed Static Input-Output Model for Three and More than Three Sectors, Open and Closed Dynamic Input-Output Model for Two and Three Sectors.

Unit-IV

14 Lectures

General Linear Programming Problems and Its Matrix Conversion, Simplex Method, Degeneracy Surplus and Slack Variables and Their Use in Solving Linear Programming Problems, Interpretation of Input-Output Model, Hawkins-Simon Conditions, Samuleson's Substitution Theorem.

Game Theory: Meaning and Types, Pay-off Matrix of 'M x M', Saddle Point. Solution and Linear Programming Equivalence to Game Theory.

Applications of Game Theory for Domestic & Global Economic Problems.

Reading List :-

Allen, R.G.D, Mathematical Analysis for Economists.

Archibald, G. and Lipsey, R.G., Introduction to Mathematical Treatment of Economics.

A. Dixit, Optimization in Economic Theory, OUP, (1995).

A First Course in Optimization, Sundaram, OUP, 1996.

Baumol, W.J., Economic Theory and Operations Analysis.

Basic Linear Algebra - T. S. Blyth and E. F. Robertson; Springer.

Bolton and Dewatripont, *Contract Theory*, the MIT Press, 2005.

Chiang, A.C., *Fundamental Methods of Mathematical Economics*.

Dorfman, P. Samuelson and R. Solow, *Linear Programming and Economic Analysis*.

Fudenberg and Tirole, *Game Theory*, the MIT Press, 1991.

Hadley, *Linear Programming*, Addison-Wesley Pub Co (1962)

Intrilligator, *Mathematical Optimization and Economic Theory*, (1971).

K. Sydsaeter, P Hammond, *Mathematics for economic analysis*, Pearson Education, (2002).

Laffont and Martimort: *Theory of Incentives, The Principal Agent Model*, Princeton University Press, 2001.

Mehta B. C. And Madnani G.M. K., *Mathematics for Economists*, Latest Edition.

Mathematical Programming, F. S. Hillier and G. J. Liberman (available in the Departmental Library)

Osborne, Martin J., *An Introduction to Game Theory*, the MIT

Simon and Blume, *Mathematics for Economists*, Norton and Company, 1994.

Yamane, T., *Mathematics for Economists*.

Elective Groups

GROUP-V (Quantitative Economics)

ECO-595- Applied Econometrics (Elective - 4 Credits)

Unit-I	12 Lectures
Estimation of P Keynesian Aggregate Consumption Function.	
Estimation of Alternative Consumption Function: Duesenbury, Kuznets, Hanson, Milton Freidman and Life Cycle	
Unit-II	12 Lectures
Estimation of Demand and Supply Function.	
Estimation of Demand Investment Function- Micro and Macro	
Estimation of Aggregate Saving Function	
Unit-III	12 Lectures
Estimation of Simultaneous Equation Models	
Particularly Supply/Demand Models and IS-LM Model	
Estimation of Aggregate;	

- a- Tax Function
- b- Import Function and
- c- Export Function

Unit-IV

12 Lectures

Estimation of Production Function

Short-run and Long-run Production Function

Cobb-Douglas Production Function and CES Production Function.

Reading List :

Baltagi, B.H., Econometrics.

Chow, G.C., Econometrics.

Dhrymes, P.J., Econometrics Statistical Foundations and Applications.

Dougherty, C., Introduction to Econometrics.

Goldberger, A.S., Introductory Econometrics.

Gujarati, D. N. (1995), Basic Econometrics (IInd Edition), New Delhi, McGraw-Hill.

Greene W.H., Econometric Analysis, 4th edition, Pearson Education (2000)

Hamonda, O.F. and J.C.R. Roley: Time Series Model, Causality and Exogeneity

Intrilligator, M.D., Econometric Methods, Techniques and Applications.

Intrilligator, M.D., Econometric Methods, Techniques and Applications.

J. Johnston, Econometric Methods, 3rd Edition, McGraw-Hill/Irwin; 4th edition (1996)

Klein, L.R., Introduction to Econometrics. Mehta P. C. And Madnani G.M. K., Econometrics, Latest Edition.

Koutsoyiannis, A. (1997), Theory of Econometrics (IInd Edition), London, the Macmillan Press.

Krishna, K. L., (1997), Econometric Applications in India, New Delhi, Oxford University Press.

Kamenta, J. (1997), Elements of Econometrics, New York, University of Michigan Press.

Maddala, G.S. (Ed.) (1993), Econometrics Method and Applications, (2 vols.) U. K.; Alders Hot.

Sen, A., Poverty: An Ordinal Approach to Measurement, Econometrica.

Theil, H., Introduction to Econometrics.

Theil, H., Principles of Econometrics.

Elective Groups

GROUP-V (Quantitative Economics)

ECO-596- Operations Research (Elective - 4 Credits)

Unit-I

12 Lectures

Concept and Operational Definitions, Phases of O.R., Models and Modelling in O.R., O.R. Techniques, Relevance of O.R. in Business Decisions, Uses and Limitations of O.R.; Linear Programming: Problem Formulation, Graphical Solution, Simplex Method, Duality Concept, Post-Optimality Analysis, Transportation Model.

Unit-II

12 Lectures

Project Management: Comparison of PERT/CPM, Assumption of PERT/CPM, Algorithms of PERT/CPM Techniques, Network Analysis, Fundamental of Network Model, Three-estimate Approach of PERT, Resource Leveling and Time-cost Trade-off Analysis, Project Control, GERT, LOB. Inventory Control Model: Deterministic Inventory Control Models. Simulation Techniques: Operational Definitions, The Nature of Simulation; Systems, Models and Simulation; Motivation, Limitations and Pitfalls; Monte-Carlo Simulation Technique.

Unit-III

12 Lectures

Decision Theory: Basic Structure and Components of Decision, Decision Criteria, Decision Tree.

Game Theory: Theory of Two-person, Zero-sum-Game; Mixed Strategies, Theory of Two-person, Non-zero-sum-game, Solution Method of Game.

Queueing Theory: Basic Characteristics, Queueing Models: M/M/1 System, M/M/C System, M/EK/1 System.

Sequencing Models: Classification, Assumptions, Sequencing Problems: n Jobs through Two Machines, n Jobs through Three Machines, Two Jobs through M-Machines, n Jobs through M-Machines.

Unit-IV**12 Lectures**

Replacement, Maintenance, and Reliability Problems

Information Theory: Entropy- A Measure of Uncertainty.

Integer Programming: Cutting Plane Algorithm, Branch and Bound Algorithm.

Non-Linear Programming: Khun-Tucker Conditions, Quadratic Programming.

Reading List :

Ackoff, Russell L., and Maurice W. Sasieni, *Fundamental of Operations Research*, New York, 1968.

Budnick, Frank S. D. Mcleavery and R. Mojena, *Principal of Operations Research for Management*, Richard D. Irwin Inc., Homewood, Illinois, 1988

Hiller, Frederick S. and Gerald Liberman, *Operations Research*, CBS Publishers, New Delhi, 2000.

Mustafi, C.K., *Operations Research: Method and Practice*, New Age International, New Delhi, 1996.

Sen, Rathindra P., *Operations Research: Algorithms and Applications*, PHI Learning Pvt., Ltd., New Delhi, (Third Print) 2012.

Swarup, Kanti, P.K. Gupta and M. Mohan, *Tracts in Operations Research*, Sultan Chand & Sons, New Delhi, 2010.

Taha, H.A., *Operations Research 1999, An Introduction*, Prentice-Hall of India, New Delhi,

Wagner, H.M., *Principles of Operations Research with Applications to Managerial Decision*, Prentice-Hall of India, New Delhi, 1998.