

**Course Structure**

**of**

**Master of Arts in Economics**

**Department of Economics**

**Central University of Haryana,**

**Mahendergarh**

**(Finalized By School Board in 2011)**

The Master of Arts (M.A.) in Economics is a two years full time programme. The programme is composed of four semesters I, II, III and IV. Following is the semester wise distribution of study courses:

### Semester –I

Paper Nomenclature	Course Code	Credit
<i>Core Courses</i>		
Microeconomic Theory-I	SHS ECO 01 101 C 3104	4
Macroeconomic Theory-I	SHS ECO 01 102 C 3104	4
Economic Growth and Development-I	SHS ECO 01 103 C 3104	4
Mathematics for Economic Analysis	SHS ECO 01 104 C 2103	3
<i>Elective Courses</i>		
Agriculture Economics	SHS ECO 01 101 E 2103	3
Labor Economics	SHS ECO 01 102 E 2103	3
Mathematical Economics-I	SHS ECO 01 103 E 2103	3
<i>Electives to be opted from Courses Offered by:</i>		
Management Department		3
Education Department		3
Law Department		3
Total Credit		33

### Semester-II

Paper Nomenclature	Course Code	Credit
<i>Core Courses</i>		
Microeconomic Theory-II	SHS ECO 01 201 C 3104	4
Macroeconomic Theory-II	SHS ECO 01 202 C 3104	4
Economic Growth and Development-II	SHS ECO 01 203 C 3104	4
Statistical Methods	SHS ECO 01 204 C 2103	3
<i>Elective Courses</i>		
Health Economics	SHS ECO 01 201 E 2103	3
Industrial Economics	SHS ECO 01 202 E 2103	3
Mathematical Economics-II	SHS ECO 01 203 E 2103	3
<i>Electives to be opted from Courses Offered by:</i>		
Management Department		3
Education Department		3
Law Department		3
Total Credit		33

### Semester-III

Paper Nomenclature	Course Code	Credit
<i>Core Courses</i>		
International Economics-I	SHS ECO 01 301 C 3104	4
Econometrics-I	SHS ECO 01 302 C 3104	4
Indian Economy	SHS ECO 01 303 C 3104	4
Public Economics-I	SHS ECO 01 304 C 2103	3
<i>Elective Courses</i>		
Financial Markets, Institutions and Services	SHS ECO 01 301 E 2103	3
Applied Demand Analysis	SHS ECO 01 302 E 2103	3
Economics of Infrastructure	SHS ECO 01 303 E 2103	3
<i>Electives to be opted from Courses Offered by:</i>		
Management Department		3
Education Department		3
Law Department		3
Total Credit		33

### Semester-IV

Paper Nomenclature	Course Code	Credit
<i>Core Papers</i>		
International Economics-II	SHS ECO 01 401 C 3104	4
Econometrics-II	SHS ECO 01 402 C 3104	4
Research Methodology	SHS ECO 01 403 C 3104	4
Public Economics-II	SHS ECO 01 404 C 2103	3
<i>Elective Paper</i>		
Contemporary Issues in Indian Economy	SHS ECO 01 401 E 2103	3
Time Series Econometrics	SHS ECO 01 402 E 2103	3
Applied Production Analysis	SHS ECO 01 403 E 2103	3
<i>Electives to be opted from Courses Offered by:</i>		
Management Department		3
Education Department		3
Law Department		3
Total Credit		33

### Course Code: Example

SHS ECO 01201C/E 3104: SHS (School of Arts, Humanities and Social Sciences), ECO (Economics Department), 01(Programme), 2 (Semester), 01 (Course), C/E (Core/ Elective), 3 (Lecture), 1 (Tutorial), 0 (Practical), 4 (Total Credits).

## **Microeconomic Theory-I**

Nature and scope of microeconomics; the circular flow of economic activity, positive and normative economics, theorizing and modeling; theory of consumer behavior: cardinal utility, indifference curve, revealed preference theory, derivation of consumer demand, Slutsky's theorem (substitution and income effect); market demand; elasticities of demand, relation between revenue and price elasticity, constant elasticity demand function; consumer surplus, indirect utility function.

Consumer behaviour under risk and uncertainty: concept of certainty, risk, and uncertainty, measurement of risk, attitudes towards risk, risk aversion, risk loving and risk neutral, risk aversion and indifference curves, reducing risk and uncertainty, insurance and gambling.

Theory of production: diminishing law of variable proportions, law of returns to scale, marginal rate of technical substitution, elasticity of substitution, factor intensity, efficiency of production, multi product firm, production possibility curve: properties and empirical significance of Cobb-Douglas(C-D), constant elasticity of substitution (CES) and Trans-log (TL) production functions; Traditional and modern theories of cost, total, fixed and variable costs, short run and long run cost, relation between average and marginal costs, 'envelope' and L-shaped curves.

Theory of firm: price and output determination under perfect competition, short run and long run equilibrium of the firm and industry, supply curve, efficiency implications of perfect competition, determination of price and output under monopoly; short run and long run equilibrium, price discrimination, regulated monopoly and monopoly control.

## **Macroeconomic Theory-I**

Introduction, measurement of national income: product approach, income approach, expenditure approach; measures of aggregate income: concept of gross, net, national, domestic, market prices and factor costs, concept of value added; methodology of estimation of national income in India; GDP deflator, consumer and producer price index.

Classical macroeconomics; Say's law, equilibrium output and employment, New classical models of output determination, Keynes model of income determination,

Consumption function: average and marginal propensity to consume, consumption hypothesis; permanent income hypothesis, relative income hypothesis, life cycle hypothesis.

Savings and investment; business fixed investment, residential investment, inventory investment, marginal efficiency of investment (MEI), marginal efficiency of capital (MEC), saving and investment functions, determination of interest rates, multiplier concept, acceleration principle and its implications, business cycles; meaning and phases of the business cycle, interaction of multiplier and accelerator; Business cycles; Samuelson model, Hicks model, Keynesian model and Kaldor model.

Introduction to economic fluctuations: time horizons in macroeconomics, aggregate demand, aggregate supply, stabilization policy.

## **Economic Growth and Development-I**

Meaning and measurement of economic development; economic growth and development, economic development and welfare, meaning of economic under development, characteristic of under developed economies, vicious circle of poverty; measurement of development; conventional, human development index, and quality of life indices, concept of sustainable development.

The big push theory, critical minimum effort thesis, stages of economic growth, concept of take off into self-sustained growth, balanced versus unbalanced growth, balanced growth, unbalanced growth, Malthus Theory of population, factors in economic development, theories of development: Lewis model, Renis-Fei model.

Neo-classical model of economic growth; short run versus long run, three determinant of growth, basic growth equation, conditions for steady state growth, stability of steady state growth, sources of growth, technical progress and neutrality of technical change.

Economic development and planning models: meaning of economic planning, planning versus price mechanism, main elements of plan and plan models; Harod-Domar model, Mahalanobis model and development plans in India.

## **Mathematics for Economic Analysis**

Concepts of sets subset and bounded set, set operations, convex set, identification of convex set in budget line statement, production possibility frontier, indifference and isoquant curves, Cartesian product, relations and functions, idea of polynomial, exponential, logarithmic and trigonometric functions; Solution of linear and quadratic equations; limit and continuity of functions (single variable);

Concept of a derivative and rules of differentiation: monotonicity, concavity and convexity of functions of a single variable; necessary and sufficient conditions for a maximum and minimum: applications to economics, total to marginal magnitudes, elasticities.

Idea of integration: definite and indefinite integral, rules of integration, applications in economics, relation between marginal and total magnitudes, relations between cost curves, consumer surplus.

Definitions of vector and matrix: addition and multiplication of matrices, transpose and inverse of a matrix, minors and co-factors of a matrix, determinant of a matrix, rank of a matrix, simultaneous system of equations, Cramer's rule, solution of homogeneous and non homogeneous system of equations; signs of quadratic forms with and without constraints, positive definite, negative definite, positive semi definite, negative semi- definite.

Functions of several variables: production functions, utility functions, cost functions; partial and total derivatives; implicit functions and their derivatives. Homogeneous functions; Euler's theorem; degrees of homogeneity of production functions, cost functions, demand, functions and their economic interpretation,

Necessary and sufficient conditions for stationary values without constraints; necessary and sufficient conditions for stationary values with linear constraints- the Lagrange method; constrained maximization of utility.

Difference equation: solutions of linear first and second order difference equations with constant coefficients and constant terms.

## **Agriculture Economics**

Nature and scope of agricultural economics; economic development with unlimited supplies of labour; Lewis-Fei-Ranis model; Lewis versus the Harris-Todaro view of underemployment in LDCs, wage spillover and unemployment in a wage-gap economy; measurement problems of surplus labour and disguised unemployment; theory of agricultural production, three stages of production function.

Agricultural labour force and productivity: farm size and productivity, supply functions and price responsiveness, contractual arrangements, employment and wages in rural markets; interdependence between agricultural and industry; terms of trade between agriculture and industry.

Rural credit markets and institutions in developing countries; rural infrastructure prospects and strategies for land reforms; some theoretical aspects of agricultural policies; agricultural diversification, food processing, and standardisation.

Agricultural development strategies: induced technical and institutional change, green revolution; microeconomics of the rural sector; the new development economics; risk and uncertainty in agriculture, environment and agricultural development; WTO and agriculture.



## **Labour Economics**

Labour - Its Characteristics; Role of Labour in Economic Development - W.A. Lewis and Ranis Fie; Mobility and productivity of labour.

Supply of Labour: Static Labor-Leisure Choice, Effects of Social Programs and Income Taxes, The Life-Cycle Model, Investments in Human Capital, Collective Models of Household Labor Supply, Occupational Choice; Demand of Labour: Static Cost, Profit and Labor Demand Functions, Elasticity of Derived Demand: the Hicks-Marshall Rules, Adjustment Costs and Dynamic Labor Demand; Equilibrium in Labour Market: Compensating Differences -- Adam Smith, Efficiency Wages, Segmented Labor Markets, Migration.

Employment and Development Relationship - Unemployment: Concept, Types, and Measurement, particularly in India; Public Sector and Employment in Agricultural Sector; Analysis of Educated Unemployment; Employment Policy in Five Year Plans and its Evaluation.

Classical, Neo-classical and Bargaining Theories of Wage Determination; Concepts of Minimum Wage, Living Wage and Fair Wage in Theory and Practice; Discrimination in Labour Markets; Productivity and Wage Relationship; Analysis of Rigidity in Labour Markets; National Wage Policy; Wages and Wage Boards in India; Bonus System and Profit Sharing.

Theories of Origin and Growth of Labour Movement - Growth, Pattern and Structure of Labour Unions in India, Achievements and Failures of Labour Unions; Industrial Relations - Industrial Disputes and industrial Peace; Causes of industrial Disputes and their Settlement and Prevention Mechanism.

Special Problems of Labour: Child Labour, Female Labour, Discrimination and Gender Bias in Treatment of Labour; Labour Market Reforms in India - Second National Commission on Labour; Globalisation and Labour Markets.

## **Mathematical Economics-I**

Introduction: The role of theory, Microeconomics, The role of mathematics.

Theory of consumer behaviour: basic concepts, maximization of utility, demand functions, income and leisure, substitution and income effects, generalization of n variables.

Topics in consumer behaviour: A linear expenditure system, separate and additive utility function, homogeneous and homothetic utility functions, indirect utility functions and duality in consumption, theory of revealed preferences, derivation of demand functions from necessary conditions' and the Slutsky equation from the sufficient condition, interpretation of Lagrangian multiplier, consumer surplus, Problem of choice in situations involving risk, behaviour under uncertainty.

The Theory of firm: basic concepts, optimizing behaviour, input demands, cost functions, joint production, profit maximization and substitution effect.

Topics in theory of firm: homogeneous production function, CES production functions, C-D production function, the Kuhn-Trucker theorem, duality in production, production under uncertainty, linear production functions, linear programming.

## **Microeconomic Theory-II**

Monopolistic competition; price and output decisions under monopolistic competition, equilibrium with product differentiation and selling costs, excess capacity under monopolistic and imperfect competition, criticism of monopolistic competition; non-collusive oligopoly, Cournot, Bertrand, Chamberlin, and kinked demand model, collusive and non-collusive oligopoly behavior; cartels and mergers, price leadership and basing point price system.

A critique of Neoclassical theory of the firm; Alternative theories of the firm: Baumol's sales revenue maximization model, Williamson model of managerial discretion, Marris model of managerial enterprise, Bain's limit pricing theory, the behavioral model of Cyert and March.

Neoclassical theory of factor pricing: marginal productivity theory, product exhaustion theorem, elasticity of technical substitution, technical progress and factor shares, theory of distribution in imperfect product and factor markets, determination of rent, wages, interest and profits.

General equilibrium theory: Walras general equilibrium model, graphical illustration of existence, uniqueness and stability of equilibrium; Welfare economics: criteria of social welfare, the Pareto-optimality criterion, Kaldor Hicks compensation criterion; Bergson's social welfare function, criterion Arrow's impossibility theorem; Game theory: zero-sum and non-zero-sum game, pure and mixed strategy, dominant strategy, Nash equilibrium.

## **Macroeconomic Theory-II**

Money: definition, components of money stock, demand for money, transaction motive, precautionary motive, speculative motive, quantity theory of demand for money, Cambridge quantity theory, Baumol and Tobin demand for money, inflation and interest rates, nominal interest rate and demand for money, Keynesian liquidity approach, determinants of money stock, money multiplier.

Goods market and IS curve, money market and LM curve, equilibrium, explaining fluctuations with the IS-LM model, IS-LM – fiscal and monetary policy. Aggregate demand in the open economy, Mundell-fleming model, exchange rate: determination, flexible and fixed exchange rate system, monetary and fiscal policy in flexible and fixed exchange rate system.

Inflation and its effects; effect on distribution of income and wealth, effect on output, employment and growth, causes and types of inflation; demand pull inflation, cost push inflation, structural inflation, policies to control inflation, tradeoff between inflation and unemployment, Philips curve: adaptive and rational expectations.

New macro economics; Lucas imperfect information, model, new Keynesian model of price stickiness, rational expectations, random walk of GDP.

Central banking and monetary controls; functions of a central bank; monetary policy: objectives of monetary policy, policy making process, implications of targeting monetary aggregates and interest rate.

## **Economic Growth and Development-II**

Role of education, knowledge, and governance in economic development; trade and development; trade as engine of growth; Perbisch, Singer and Myrdal views, gains from trade and less developed countries (LDC), role of foreign direct investment(FDI) and multinational corporation (MNC) in economic development.

Concept and measures of poverty; head count ratio, income gap ratio, Sen's poverty index; concept and measures of inequality; Lorenz curve and Ginnis' coefficient; growth and new industrial policy; privatization and disinvestments; labour market reforms; state and state failures; issues of good governance.

Economic development and environmental degradation: environmental Kuznet's curve, preservation and irreversibility of environmental change, Krutilla-fisher equation, energy and development.

Solow model: Basic Solow model, technology and Solow model, Solow model with human capital; Economics of ideas; Economic growth: Romer model,

Endogenous growth: mechanics of endogenous growth, the deeper economics of endogenous growth, convergence, population growth and Malthus, Lessons from Asian tigers, natural resources as limits to growth, neoclassical versus endogenous growth theory.

## **Statistical Methods**

Data and data types, representation of data; Measures of central tendency from grouped and ungrouped data: arithmetic mean, median, mode, geometric mean, and harmonic mean, measures of dispersion from ungrouped data, range, mean deviation, quartile deviation, standard deviation and coefficient of variation.

Measures of Skewness and Kurtosis: moments about origin, arithmetic mean, and an arbitrary value; concepts and computation of Skewness and Kurtosis.

Correlation and regression: method of least squares, estimation of parameters of a regression equation; simple, partial, and multiple correlation coefficients.

Probability and probability distribution: concepts, addition and multiplication rules of probability, mathematical expectation; theoretical distributions: binomial, normal, and Poisson distribution.

Sampling and sampling distribution: sample and population, sampling and non sampling errors, sampling techniques.

Estimation and hypothesis testing: point and interval estimation, properties of estimator; consistency, sufficiency, unbiasedness, and efficiency, null and alternative hypotheses, degrees of freedom, Type-I and Type-II errors; level of significance; small and large sample tests;  $t$ ,  $\chi^2$ ,  $F$  and  $Z$ .

## **Health Economics**

Introduction: the relevance of economics in health and medical care

The Supply and Demand for Health and Medical Care: Supply of Health and Medical Care, The production of health, The production, cost and technology of medical care; Demand for Health and Medical care: Health as an investment good, Demand for Medical care; The demand for health insurance; The market for health insurance: its performance and structure

The role of government in Health and medical care: Government intervention in medical care, market imperfections, market failure, redistribution using in-kind subsidies; Health care reform

Health dimensions of development - Determinants of health – Poverty, malnutrition, illiteracy and lack of information, Economic dimensions of health care –Financing of health care and resource constraints - Inequalities in health – Class and gender perspectives; Institutional issues in health care delivery.

## **Industrial Economics**

Concept and organisation of firm ownership, control and objectives of a firm. Theories of Industrial Location; Weber and Sargent Florence, Factors Affecting Location, Market Structure; Seller's Concentration, Product Differentiation, Entry and Exit Conditions, Economies of Scale, Market Structure and Profitability. Market Structure and Innovation.

Product-Pricing Theories and Evidence. Investment Expenditure and Methods of Evaluating Investment Expenditure; Theories and Empirical Evidence on Mergers and Acquisitions (M & As), and Industrial Diversification. Growth and constraints on the Growth of the Firm, Concepts and Measurement of Productivity, Efficiency, and Capacity Utilisation.

Pattern of Industrialization; Public and Private, Large and Small Industries. Cost Benefit Analysis; Net Present Value (NPV); Internal Rate of Return (IRR); MNC and Transfer of Technology; Foreign Direct Investment (FDI) and Technology, Industrial Labour Problems, Reforms, Liberalisation, Disinvestment, Privatisation and Social Security Consideration.

Industrial finance; Owned, External, and other components of funds. Role, nature, volume, and types of institutional finance; IDBI, IFCI, SFCs, SIDC, Commercial banks, Financial statements; balance sheet, profit and loss account, assessment of financial soundness, and ratio analysis. Development of small scale and cottage industries in India.



## **Mathematical Economics-II**

Market Equilibrium: Assumptions of demand function, demand functions, supply functions, commodity market equilibrium; Monopoly, monopsony & monopolistic competition: monopoly basic theory, monopoly price discrimination, monopoly applications, monopolistic competition.

Welfare economics: Pareto optimality, efficiency of perfect competition, external effect in consumption and production function, taxes and subsidies, social welfare functions, theory of second best.

Applications to Harrod-Domar one sector model, Solow model, Endogenous growth model: AK and Lucas model; Cobweb model and the dynamic multiplier, Samuelson multiplier acceleration interaction model, IS and LM curves.

Leontief's input-output models (closed and open), Hawkin-Simon condition, price solution for Leontief model; Elementary idea of game theory: zero sum and non zero sum game, pure and mixed strategy, dominating strategy, saddle point solution of a game, a duopoly game.

## **International Economics-I**

International economics: introduction, international trade and Nation's standard of living, current international economic problems; Trade theories: concept of international trade, basis for and gains from trade, trade based on Absolute Advantages, Comparative advantages, Comparative advantages and opportunity cost; standard theory of trade: production frontier with increasing costs, community indifference curve, equilibrium in isolation.

Demand and supply, offer curves and terms of trade: Equilibrium relative commodity price with trade - a partial equilibrium analysis, general equilibrium analysis, offer curves, terms of trade.

Factor endowments and Hecksher Ohlin Theory: factor intensity, factor abundance, factor price equalization, and income distribution, Stolper Samuelson theorem, Leontiff paradox; Modern trade theory: economies of scale, imperfect competition, product differentiation.

International Trade Policy: Trade Restrictions; tariffs, partial equilibrium analysis of a tariff, theory of tariff structure, general equilibrium analysis of tariff in small country and large country, optimum tariff; non-tariff barriers: import quotas, other non-tariff barriers and new protectionism, political economy of protectionism, Uruguay round and outstanding trade problems.

## **Econometrics-I**

Introduction: Broad classification of economic relations, stochastic and non stochastic relations, econometrics versus mathematical economics, econometrics versus statistics, concepts of econometric and mathematical models and their essential ingredients, functions of econometrics, essential steps of an empirical study.

The simple linear regression model: ordinary least squares (OLS) estimators and their properties, goodness of fit and tests of hypotheses, effect of changing scale and units of measurement of variables.

Multiple linear regression model: least squares estimators and their properties, coefficient of determination ( $R^2$ ) and adjusted coefficient of determination ( $R^2$ ) as measures of goodness of fit, commonly used functional forms, their choice and interpretation of coefficients, testing of hypotheses, testing individual coefficients, testing several coefficients jointly, testing linear combination of coefficients, computing  $R^2$ ,  $R^2$  and F-statistic when there is no intercept term, effect of omitting intercept term, effect of inclusion of irrelevant and exclusion of relevant variable in the model.

OLS assumption violations: Multi-collinearity, heteroscedasticity, and auto-correlation, detecting the problems, their consequences and solutions.

## **Indian Economy**

Characterization of Indian Economy as a Developing Economy, Output of the economy and its composition; Rationale, Features and Objectives of Indian Economic Planning, Vision and Strategy for Twelfth Five Year Plan, Economic Reforms in India, Macroeconomic Stabilisation, Structural Reforms, Performance of Indian Economy since Economic Reforms.

Capital Requirement and Economic Growth; Domestic Savings and Capital Formation; Concept and Incidence of Poverty in India.

Role, nature and cropping pattern of agriculture in India; public and private investment in agriculture; W.T.O. and Indian agriculture; causes and measures of low productivity in Indian agriculture; land reforms, agricultural inputs and green revolution; importance, sources, and availability of agricultural finance; agricultural marketing in India; evaluation of government's agricultural policy; agricultural subsidies, public distribution system.

Problems of small scale and cottage industries and government policy in India; industrial policy in pre and post reform period in India; evaluation of privatisation and disinvestment policy in India; private sector in the post liberalisation period.

Monetary Policy of the Reserve Bank of India and its Appraisal; Fiscal Policy in India; Fiscal Imbalance, Deficit Finance and Fiscal Responsibility in India; Growth and Structure of India's Foreign Trade, the Pre and Post 1991 Period Balance of Payments Situation in India;

## **Public Economics-1**

Allocation of resources – Provision of public goods; Voluntary exchange models; Impossibility of decentralized provision of public goods (contributions of Samuelson and Musgrave); Demand revealing schemes for public goods – Tiebout model, theory of club goods; Stabilization Policy – Keynesian case of stabilization policy; Uncertainty and expectations; Failure of inter temporal markets; Liquidity preference; Social goals; Poverty alleviation; Provision of infrastructural facilities, removing distributional inequalities and regional imbalances.

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; Wagner's law of increasing state activities; Wiseman-Peacock hypothesis; Pure theory of public expenditure; Structure and growth of public expenditure; Criteria for public investment; Social cost-benefit analysis – Project evaluation; Estimation of costs, discount rate; Reforms in expenditure budgeting; Programme budgeting and Zero base budgeting.

Theory of incidence; Alternative concepts of incidence – Allocative and equity aspects of individual taxes; Benefit and ability to pay approaches; Theory of optimal taxation; Excess burden of taxes; Trade-off between equity and efficiency; Theory of measurement of dead weight losses; The problem of double taxation.

## **Financial Markets, Institutions and Services**

Financial system: An overview, global financial system, Indian financial system, functions of financial system in an economy, financial services: insurance services, IRDA and its functions, factoring and forfaiting, merchant banking, mutual funds, venture capital, micro-financial services.

Indian financial markets: Money markets and capital markets. Recent Reforms Call Money Market, Treasury Bills Market, Commercial Bills Market, Markets for Commercial Paper & Certificate of Deposits, Recent Developments in Capital Markets in India, Role of SEBI, Merchant Banking, Venture Capital.

Financial & Banking Institutions: Role, Meaning and Importance of Financial Institutions, SIDBI, NABARD, IFCI, state finance corporations and Banks in the Emerging New Environment of Privatization and Globalization.

Investment Trust Companies, Economics of Investment Trust Companies, Mutual Funds, A Detailed Critical Appraisal of UTI in the Indian Financial System. NBFC: Activities and Role of NBFC; Regulatory Framework of NBFC; Recent development.

Financial sector reforms, features of financial markets, financial repression and major financial reforms in India, supply and loans of demand for deposits.

## **Applied Demand Analysis**

Theory and Models of Theory; Testability of Theory and Models; Significance of Consumer Demand; Sources, Nature, and Refinements of Consumer Demand Data; Concept of Duality and Duality Between Direct and Indirect Utility Functions; Roy's Identity.

Estimation and Analysis of Consumer Demand Models; Measurement of Engle Curves From Household Budget Data; Modelling of Household Composition and Size; Specification and Estimation of Single Equation Models of Demand.

Constant Elasticities Demand Functions; Simultaneous Equation Demand Models; The Linear Expenditure Model, The Rotterdam Model, Addilog (Direct and Indirect) Model, and Almost Ideal Demand (AID) Model; Incorporation of Durablegoods, habit formation and distributional effects.

## **Economics of Infrastructure**

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; Economies of scale of joint supply; Marginal cost pricing vs. other methods of pricing in public utilities; Cross subsidization – free prices, equity and efficiency.

The structure of transport costs and location of economic activities; Demand for transport – Models of freight and passenger demand; Model choice; Cost functions in the transport sector; Principle of pricing; Special problems of individuals modes of transport; Inter-model condition in the Indian situation.

Rate making in telephone utilities; Principles of decreasing costs in telephone industry – Characteristics of postal services; Criteria for fixation of postal rates; Measurement of standards of service in telephone and postal utilities.

Primacy of energy in the process of economic development; Factors determining demand for energy; Effects of energy shortages; Energy conservation, renewable and nonconventional sources of energy; Energy modeling; The search for an optimal energy policy in the Indian context.

Bulk supply and pricing of electricity – The relative economics of thermal, hydel and nuclear power plants – The case for a National Power Grid, financing water utilities - Urban and rural water supply; The exploitation of National Gas; Pricing problem.

Education and economic growth; Approaches to educational planning, social demand, rate of return and manpower balance approaches; The case for universal, free, primary education; Structure of higher education and problems of its financing in India; Human resources and human capital development – The issues in education policy;



## **International Economics-II**

Economic integration: customs, unions and free trade area; trade creation, trade diversion, theory of second best, dynamic benefits from trade unions.

International trade and economic development: importance of trade to development, export instability and economic development, import substitution and export orientation.

Balance of Payment; The Current Account The Capital Account; Foreign exchange markets and exchange rates: exchange rate, spot, forward rates, foreign exchange risks, hedging and market, interest arbitrage and efficiency of foreign exchange markets; exchange rate determination: purchasing power parity, monetary approach to balance of payment.

Flexible and fixed exchange rates, balance of payment adjustments with fixed and flexible exchange rate, income adjustment mechanism, income determination in a closed economy and small open economy. Absorption approach, monetary adjustments, open economy macroeconomics: adjustment policies, The IS-LM-BP model with flexible exchange rate.

International monetary system: past, present and future, gold standard, Bretton woods, International Monetary Fund, World Bank.

## **Econometrics-II**

Qualitative variables as explanatory variables: estimating the shift in intercept and slope coefficient, interpretation of dummy coefficient in log-linear model, estimating season effects, testing for structural change; qualitative dependent variables, Linear probability model, Logit, Probit and Tobit models.

Distributed lag models: lagged independent variables, impact multiplier, interim multiplier, and long-run multiplier, Koyck approach, partial adjustment model, adaptive expectation model, consequences of the presence of lagged dependent variables as regressors.

Simultaneous equation models; structural and reduced form of simultaneous equation models; simultaneous equation bias; identification problem; estimation procedures; indirect least squares (ILS), instrumental variables (IV), and two stage least squares (2SLS).

Lagged dependent variable and serial correlation, tests of serial correlation, estimation methods with lagged dependent variable as regressors; unit roots and Dickey-Fuller tests; stationarity.

Forecasting: fitted values, ex-post, and ex-ante forecasts, evaluation of models, conditional and un-conditional forecasts, forecasting from time trends, combining forecast, forecasting from econometric models, forecasting from time series models.

## **Research Methodology**

Meaning and objectives of research, meaning and formulation of hypothesis, theory, models of a theory, testing of theories and models; Methodology versus methods of research: research problem and selection of research problem; review of literature and its role in selecting a research problem;

Meaning and need for research design: meaning of population, sample and sample size, meaning, types and characteristics of sample design, random and non-random sample, stratified and multistage random samples, systematic samples.

Methods of data collection: primary and secondary data sources, brief information about databases of Indian economy, nature of cross section, time series and panel data, diagrammatic and tabular presentation of data, pie chart, bar diagram, histogram, scatter diagram, tracing of curve, one way and two way tables.

Analysis of data: measures of central tendency and dispersion, Hypothesis testing: parametric and no-parametric tests of hypothesis; linear regression, simple, partial and multiple correlation coefficient, rank correlation, simple and multiple regression models,

Multivariate analysis techniques: factor analysis, cluster analysis, conjoint analysis, multidimensional scaling, discriminant analysis, Analysis of variance; Report writing.

## **Public Economics-II**

Classical view of public debt; Compensatory aspect of debt policy; Burden of public debt; Sources of public debt; Debt through created money; Public borrowings and price level; Crowding out of private investment and activity; Principles of debt management and repayment.

Objectives of fiscal policy – full employment, anti-inflation, economic growth, redistribution of income and wealth; Interdependence of fiscal and monetary policies; Budgetary deficit and its implications; Fiscal policy for stabilization – Automatic vs discretionary stabilization; Alternative measures of resource mobilization and their impact on growth, distribution and prices; Balanced budget multiplier.

Principles of multi-unit finance; Fiscal federalism in India; Vertical and horizontal imbalances; Assignment of function and sources of revenue; Constitutional provisions; Finance Commission; Devolution of resources and grants; Theory of grants; Resource transfer from Union to States – Criteria for transfer of resources; Centre-State financial relations in India; Problems of states' resources and indebtedness; Transfer of resources from Union and States to local bodies.

## **Contemporary Issues in Indian Economy**

Changing structure of Indian economy, Imbalance in occupational pattern and contribution to GDP, Determinants of acceleration in growth rate of GDP in India, Behaviour of saving and investment in recent years.

Stagnancy in productivity in agriculture sector and trends in its diversification; Issues of competitiveness of Indian manufacturing sector, emergence of knowledge intensive industries in India.

Centre-State finance relations; eleventh, twelfth and thirteenth finance commissions; other sources of transfer; Tax revenue of the central and state governments; evaluation of Indian tax structure; direct tax code (DTC), goods and services tax in India.

Infrastructure bottlenecks in Indian economy, impact of institutional factors on development of Indian economy.

Recent foreign trade policy in India; pros and cons of special economic zones policy; Indian government's policy towards foreign capital; foreign investment inflows, foreign aid and India's external debt. Management of foreign exchange reserves and exchange rate; issue of capital account convertibility; operations of multinational corporations (MNCs); meaning and effects of globalization on Indian economy; W.T.O., Provisions and Indian economy.

## **Time Series Econometrics**

Difference equations: Time series models, difference equations and their solutions, solving homogeneous difference equations, particular solutions for deterministic process, the method of undetermined coefficients, lag operators.

Stationary time series models: stochastic difference equation models, ARMA models, stationarity, the autocorrelation function, the partial autocorrelation function, sample autocorrelations of stationary series, Box-Jenkins model selection, and seasonality.

Modeling Economic Time Series: Trends and Volatility: ARCH process, GARCH model, ARCH-M model; Testing for Trends and Unit Roots: Unit root processes, Dicky-Fuller tests, Augmented Dicky-Fuller test, Phillips Perron test.

Multi-equation Time Series Models: Intervention analysis, Transfer function models, Introduction to VAR model, estimation and identification, the Impulse response function, structural VAR.

Co-integration and Error Correction Models: Testing for co-integration, The Engle Granger methodology, Johansen methodology, ARDL bounds-testing approach.

## **Applied Production Analysis**

Theory of production versus models of production, Testability of theory and models: production functions as models of production theory; concepts of duality and self duality, Sheppard lemma, nested and non nested forms.

Flexibility versus well behavedness of production and cost functions: tradeoff between generality and well behavedness; duality between production and cost functions: choice between production and cost function, brief discussion on the sources, nature, and refinement of production data relating to Indian economy.

Applied analysis of production and cost functions: Cobb-Douglas (C-D), constant elasticity of substitution (CSE), variable elasticity of substitution (VES), and Leontief production and cost functions, applied analysis of flexible forms of production and cost functions, trans-log production and cost functions; generalized Leontief and generalized Cobb-Douglas production function, significance of applied production analysis.

## **Suggested Readings**

### **Micro-Economic Theory-I & II**

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Mas-Colell, Andreu, Michael D. Whinston and Jerry R. Green (1995), Microeconomic Theory, OUP, New York.

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Jha, R. (1991) – Contemporary Macroeconomic Theory and Policy; (Wiley Eastern)

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Meier and Rauch: *Leading Issues in Economic Development* (8<sup>th</sup> edition), OUP.

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Sen, S.K. (1984): *Resources, Values and Development*, Basil Blackwell. London.

Thirwall, A. (1978): *Growth and Development*, Macmillan, London.

Todaro, M.P. and Smith, S.C.: *Economic Development* (8<sup>th</sup> Edition), Pearson.

### **Mathematics for Economic Analysis-I & II**

Chiang, Alpha, C : *Fundamental Methods of Mathematical Economics*, 4<sup>th</sup> Edition, MC Grow Hill, 2008.

Mukherjee B and V Pandit, *Mathematical Methods for Economic Analysis* Allied Publishers Pvt Ltd, 1982.

Knut Sydsaeter and Peter J. Hammond, *Mathematics for Economic Analysis*, Prentice Hall.

### **Mathematical Economics-I & II**

Peter N. Hess, *Using Mathematics in Economic Analysis*, Prentice Hall.

Akira Takayama, "Mathematical Economics ", Cambridge University Press, 2nd Edition.

Henderson and Quandant, "Microeconomic Theory: A Mathematical Approach"

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### **Statistical Methods**

- Clarke, G.M. and Cooke D. (1992), A Basic Course in Statistics, 3<sup>rd</sup> edition, Arnold.
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- Freud, J.E. and Walpole, R.E. (1987), Mathematical Statistics, Prentice-Hall Inc.
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- Rees, D.G. (1987), Foundation of Statistics, Chapman & Hall.
- Rice, J.A. (1995), Mathematical Statistics and Data Analysis, 2<sup>nd</sup> edition, Duxbury Press.

### **International Economics-I & II**

- Bhagwati, J. (Ed) (1981), International Trade, Selected Readings, Cambridge University Press, Massachusetts.
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### **Indian Economy**

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### **Economics of Infrastructure**

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### **Contemporary Issues in Indian Economy:**

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### **Time Series Econometrics**

Walter Enders, "Applied Econometric Time Series", John Wiley and Sons.

Kerry Patterson, "An Introduction to Applied Econometrics: A Time Series Approach", Palgrave, MacMillan.