SYLLABUS

FOR

M.A./M.SC. IN ECONOMICS

(IN CBCS STRUCTURE with effect from the Academic Session 2019-20)

Approved in the PG BOS meeting held on 30.04.2019 & 26.06.2019

DEPARTMENT OF ECONOMICS

WEST BENGAL STATE UNIVERSITY

Berunanpukuria, P.O. - Malikapur, Barasat, North 24 Parganas, Kolkata- 700126

Program Specific Outcome (PSO)

The M.A./M.Sc. program in Economics emphasizes both theory and practical applications of economic problems. It is organized to provide students with analytical tools by which they can used to solve many economic problems existing in the real world. The program also provides students with practical econometric skills that are popularly used in both private and public sectors.

Students will be able to apply:

1. Critical thinking
    a. Apply economic analysis to evaluate everyday problems.
    b. Apply economic analysis to evaluate specific policy proposals.

2. Quantitative reasoning skills

    a. Understand how to use empirical evidence to evaluate an economic argument.
    b. Obtain or collect relevant data using specific research methods.
    c. Interpret statistical results.
    d. Perform appropriate statistical analysis of data.
    e. Develop deeper quantitative thinking skills.

3. Analytical skills

    a. Analyze problems that have clear solutions.
    b. Propose solutions for problems that do not have clear answers.

4. Communication skills

    a. Communicate effectively in written and spoken form about specific economic issues.
    b. Develop a well-organized written argument that states hypothesis.
    c. Present an economic argument orally.

CBCS COURSE STRUCTURE

M.A./M.Sc. Economics

Semester	Type of Course	Name of the course	Credit	Marks	Total
Semester I	Departmental 1 (Core) Departmental 2 (Core) Departmental 3 (Core) Departmental 4 (Core) Departmental 5 (Core) AECC	Microeconomics I Macroeconomics I Quantitative Techniques International Economics Indian Economic Issues Data Analysis with R	4 4 4 4 4 2	50 50 50 50 50 25	Marks:275 Credit :22
Semester II	Departmental 6 (Core) Departmental 7 (Core) Departmental 8 (Core) Departmental 9 (Core) Departmental 10 (Core) SEC	Microeconomics II Macroeconomics II Statistical Methods Econometrics I Game Theory and Applications Evaluation of Public Policies	4 4 4 4 4 2	50 50 50 50 50 25	Marks: 275 Credit : 22
Semester III	Departmental 11 (Core) Departmental 12 (Core) Departmental 13 (Core) Departmental 14 (Core) Departmental 15 (DSE) GEC	Econometrics II Growth Economics Development Economics Industrial Organization *Any one* 1. History of Economic Thought 2. Advanced Economic Theory 3. Operations Research Contemporary Issues in Indian Economy	4 4 4 4 4 4	50 50 50 50 50 50	Marks :300 Credit :24
Semester IV	Departmental 16 (Core) Departmental 17 (Core) Departmental 18 (Core) Departmental 19 (DSE) Departmental 20 (Project)	Econometrics III Public Economics & Social Sector Financial Economics Any one 4. Ecology and Environment 5. Agricultural Economics 6. Law and Economics Project Work through Field Survey Dissertation Presentation	4 4 4 4 4 4	50 50 50 50 50 50	Marks : 300 Credit :24

Semester-I

Microeconomics I

Type of Course: Departmental 1 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

The students will learn the basics of microeconomics namely the consumer behavior, theory of production and cost based on duality concepts. They will also get knowledge about the different types of market mainly about the monopoly market and barriers to entry and about oligopoly market structure. The course also includes theories of uncertainty. This course will enable them to study industrial organization in semester-III and advanced microeconomics in semester-II.

Module 1. Theory of Consumer Behaviour (Lecture hours 20)

Preference relations - Introduction, basic properties ; Preference and utility - Existence of a utility function, Lexicographic preference relation, Leontief preference relation ; Utility maximization problem - representation, solution , Walrasian demand function, Indirect utility function and its properties ; Expenditure minimization problem - representation, solution, Hicksian demand function, expenditure function and its properties ; Duality - Introduction, relationships between demand, indirect utility and expenditure functions (Some important identities including Roy's identity) ; Money metric utility functions -examples (Cobb-Douglas utility function and CES utility function) ; Choice - Comparative statics, Slutsky equation, properties of demand functions, integrability problem ; Revealed preference theory - GARP, SARP, WARP ; Inverse demand functions and consumers' surplus in reference to welfare evaluation of economic changes.

Module 2. Theory of firms (Lecture hours 15)

Technology

Specification of technology, Output set , Input requirement set, Properties of technology – Monotonic, Convex and Regular; Different technologies- CD, CES, Translog and Leontief Technology; Returns to scale and Scale Elasticity, Elasticity of factor substitution, Homogenous and Homothetic production function, properties of these functions and case of multiple products.

Profit

Profit maximization, Properties of Profit Functions, Hotelling's Lemma, factor Demand functions, Supply functions, Comparative Statistics using profit Function.

Cost

Cost minimization, Derivation of cost functions from production functions of different technology; Conditional factor demand functions for inputs; Cost Function, Geometry of

costs, Properties of cost function, Shephard's lemma; Homothetic Cost Function; Duality between production and cost functions ; Sufficient Conditions for Cost Functions, Uses of Duality.

Module 3. Market Structure (Lecture hours 25)

Perfect Competition-Marginal analysis as an approach to price and output determination: perfect competition - short run and long run equilibrium of the firm and industry, price and output determination, supply curve; Welfare Analysis, Efficiency and Welfare.

Monopoly - Short run and Long run equilibrium, Price Discrimination, Market Power; Welfare aspects, Monopoly Control and Regulation; Pricing Behavior, Cost Distortions, Rent Seeking Behavior, Durable Goods and Limits to Monopoly Power .

Monopolistic competition - General and Chamberlin approaches to equilibrium, equilibrium of the firm and the group with product differentiation and selling costs, excess capacity under monopolistic and imperfect competition, criticism of monopolistic competition;

Oligopoly in a game theoretic approach - Cournot-Nash equilibrium; Bertrand model; Product differentiation- Linear City Model; Dynamic game: Backward induction, Subgame perfect equilibrium; Repeated Interaction: Finitely and infinitely repeated games.

Selected Readings

1. Gravelle, H. and R. Rees: *Microeconomics*, 2003, Third Edition, Prentice Hall
2. Kreps, D; A Course in Microeconomic Theory.
3. Mas-Colell, Andrew. Michael D. Whinston and Jerry R. Green: *Microeconomic Theory*, 1995, Oxford University Press.
4. Silberberg, E.: *The Structure of Economics: A Mathematical Analysis*, 1990, McGraw Hill, Second Edition.
5. Tirole, Jean: *Theory of Industrial Organisation*, 1996, Eastern Economy Edition, Prentice Hall of India.
6. Varian, H (2000) Microeconomic Analysis. W.W. Norton, New York.

Macroeconomics I

Type of Course: Departmental 2 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

The course offers an introduction to modern macroeconomics at the PG level. The purpose of the paper is to make the students familiar with the concepts of modern macroeconomics and to give students a wider vision of the present discourse in macroeconomics. The objective of this course is to introduce students to the models in macroeconomics and show how these are relevant to contemporary problems facing policymakers. This course also provides an understanding of analytical framework developed in modern macroeconomics and the policy discourse. The course structure is designed in a way to

- understand systematic facts and latest theoretical developments of macroeconomics of consumption, investment and money.
- cover major debate on inflation-unemployment trade-off.
- grasp issues of open economy macroeconomics by the learners.

The course will prepare the students to understand kinds of issues and challenges in modern macroeconomics. Students will learn the behavior of macroeconomic variables and their relationships in the context of optimality. The course will help the learners to develop aptitude to relate concepts with research and policy.

Module 1. Behavioral Foundations of Macro Economics: Consumption (Lecture hours 12)

Evolution of Macroeconomic Theories: Schools of Macroeconomic Thoughts; Consumption Function: Short-run Variability and Long-run Constancy; Permanent Income Hypotheses & Life Cycle Hypothesis; Inter-temporal Optimization Model; Interest Rate and Saving; Consumption and Uncertainty – Random Walk Hypothesis.

Module 2. Behavioral Foundations of Macro Economics: Investment (Lecture hours 12)

Marginal Efficiency of Capital Theory; The Accelerator and Investment Behaviour: Flexible Acceleration Principle; Jorgenson's Neo classical Theory of Investment; A Model of Investment with Adjustment Costs; Tobin‘s q Model: Analyzing & Implications of the Model; The Effects of Uncertainty.

Module 3. Money, Inflation & Unemployment (Lecture hours 18)

Theories of Money Demand; Money in the Utility Function; Money: Inside and Outside; Teigens' Model of Money Supply; Behavioural Approach of Money Supply;
Theories of Inflation - A Brief Review; Bent Hansen’s' Dynamic Inflation Model; Phillips Relation; Phillips Curve and Price Expectation: Natural Rate of Unemployment Hypothesis; Tobin’s Modified Philips Curve; Adaptive Expectations and Phillips Analysis; Phillips Curve and Rational Expectations - NAIRU; Okun’s Law; Seigniorage and Inflation.

Module 4. Open Economy Macroeconomics (Lecture hours 18)

Open Economy Income Determination & Balance of Payment Adjustment; Foreign Exchange Market – Equilibrium & Stability; Balance of Payment and Exchange Rate; Mundell-Fleming

Model: Equilibrium & Stability; Exchange Rate, Capital Mobility and Policy Analysis; Asset Markets, Expectations and Exchange rates; Exchange Rate Overshooting.

Selected Readings

1. Romer, D.L. Advanced Macroeconomics, 3rd Edition, McGraw Hill Company Ltd., New York.
2. Levacic, R and A. Rebman , Macroeconomics; (2nd Ed, Macmillan).
3. Branson, W.A. (1989), Macroeconomic Theory and Policy, (3rd Edition), Harper and Row, New York.
4. Mankiw, N. Gregory (2000) – Macroeconomics (4th Ed, Macmillan-Worth))
5. G. Gandolfo. International Finance and Open Economy Macroeconomics, Springer
6. Blanchard O.J. and S. Fischer. Lectures on Macroeconomics, Prentice Hall of India, 1989
7. Snowdon Brian and Vane Howard R, (2005) Modern Macroeconomics: Its Origin, Development and Current State, Edward Elgar Publishing Ltd.

Quantitative Techniques

Type of Course: Departmental 3 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

This course offers some fundamentals concepts in mathematical economics including static and dynamic optimization which would help the students to understand advanced micro and macroeconomic theories. These ideas will be helpful to the students for better understanding of growth economics and environmental in later stage.

Module 1. Functions - Concave, Convex, Quasi- concave and Quasi- convex. Homogenous and Homothetic functions, Indirect Utility Function. (Lecture hours 10)

Module 2. Static Optimization - 1st order and 2nd order conditions for constrained optimization. Global and Local optimum. Uniqueness of Local Maximum- application to economic theory. Compensated demand function/ ordinary demand function/ input demand function. (Lecture hours 15)

Module 3. Implicit function theorem - The Envelop Theorem - Hotelling's Lemma - Shephard's Lemma. Concave programming- Kuhn-Tucker condition

(Lecture hours 10)

Module 4. Comparative static analysis: Application to microeconomic theory and macroeconomic theory. Dynamic Analysis- 1st order and 2nd order homogenous / non-

homogenous differential equations and their applications- 1st and 2nd order homogenous / non- homogenous difference equations and their applications.

(Lecture hours 15)

Module 5. Calculus of Variation and Optimal control theory (Lecture hours 10)

Selected Readings

Chiang, A. C.: *Fundamentals of Mathematical Economics*, 1988, McGraw Hill.

Madden, Paul,: *Concavity and Dynamic Optimization in Microeconomics*: Blackell, 1986.
Michael Hoy, John Livernois, Chris McKenna, Ray Rees and Thanasis Stengos: Mathematics for Economics, Second edition, prentice-Hall, India

International Economics

Type of Course: Departmental 4 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

The main objective of the course is to provide the students a deep understanding about the broad principles and theories, which govern the free flow of trade in goods, services and capital across different countries. The paper spread over different modules which cover important international trade theories and policies. The different aspects of welfare implications of the policy of economic openness and the distribution of gains from trade in goods and services between and within countries are also included in the paper. The students may learn about the relevance and limitations of these principles and empirical evidence of theories. The contents of the course are particularly relevant to the students from the policy point of view under the present era of globalization and liberalization.

Module 1. **Theory of International Trade** (Lecture hours 25)

1. Distinguish between inter-regional and international trade. A brief review of traditional trade theories - absolute advantage, comparative advantage and opportunity costs, reciprocal demand.
2. The modern theory of factor endowments, theory of factor price equalization,
3. Extension of Heckscher-Ohlin theory of trade, Economies of scale and Trade under imperfectly competitive market, Role of dynamic factors - changes in factor endowments (The Rybczynski Theorem), changes in tastes, technology, non-traded goods, differing demand conditions and transport costs in explaining the emergence of trade;.
4. New trade theories- The Kravis Theory of Availability, Linder's Theory of Volume of Trade and Demand Pattern, Kenen's Theory of Human Capital, intra-industry trade and its impact on developing economies.

Module 2. Trade Policy & Intervention (Lecture hours 8)

The Theory of Interventions (Tariffs, Quotas and non-tariff barriers): Economic effects of tariffs and quotas on national income, output, employment, terms of trade, income distribution. The political economy of non-tariff barriers and their implications; nominal, effective and optimum rates of tariffs — their measurement, impact and welfare implications.

Module 3. Economic Growth and International Trade (Lecture hours 7)

Production and consumption effects of growth -H.G. Johnson, effects of growth on terms of trade- immiserizing growth.

Module 4. The Economic Integration and Co-operation (Lecture hours 10)

Distinguish between Regional economic integration and international economic integration, different types of economic integration (PTA, FTA, CU, CM, EU, TEI). Theory of customs union, trade creation versus trade diversion, partial and general equilibrium approaches to the theory of customs union, static and dynamic affects.

Module 5. Balance of Payments (BOP) & Exchange Rate (Lecture hours 10)

Structure of BOP accounts, equilibrium and disequilibrium in the BOP, the Monetary Approach to BOP, Monetary and Fiscal Policies under Alternative Exchange Rate Regimes (Mundell-Flemming model).Foreign Exchange Market - Spot and Forward Rates, Hedging and Speculation, Interest Rates Arbitrage.

Selected Readings

1. Appleyard, A. Field, S.L. Cobb (1992), International Economics, McGraw-Hill Irwin.
2. Balassa, B. (1962), The Theory of Economic Integration, George Allen & Unwin Ltd., London.
3. Chacholiades, M. (1990), International Trade: Theory and Policy, McGraw Hill, Kogakusha, Japan.
4. Krugman, P.R. and M. Obstfeld (1994), International Economics: Theory and Policy, Glenview, Foresman.
5. Soderston & Reed (1994),International Economics, The Macmillan Press Ltd., London

Indian Economic Issues

Type of Course: Departmental 5 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

The main objective of this paper is to develop the analytical ability of the student by highlighting an integrated approach to the different aspects and dimensions of the Indian economy. The course is divided into several modules which include economic growth and structural changes in India, functioning of Indian agriculture sector, industrial sector, financial sector and India's external sector. The emphasis of the paper is on overall social, political and economic environment influencing policy decisions. Contemporary issues in Indian economics are also highlighted in the course for the students to properly understand various issues and problems of Indian Economy.

Module 1. Growth and Structural Changes (Lecture hours 8)

Economic Growth in Independent India ; Occupational structure and economic development – growing importance of the tertiary sector, an analysis of trend during 1951-2000 ; Approaches to economic development and its measurement ; Human Development in India and its constituent states (WB economy in Special)

Module 2. Agriculture Sector (Lecture hours 15)

Trends in Agricultural production and productivity, Issues in Indian agricultural policy, Agricultural price policy, Agricultural subsidies and investment, Food Security, Public distribution system in India, Agriculture and W.T.O., Rural Credit, Farmers' earning and rural indebtedness, Contract Farming.

Module 3. Industrial Sector (Lecture hours 8)

Growth and pattern of industrialization; New Industrial policy under economic reforms; Small-scale industries in India; Industrial labour and Trade Union movement; Financing and Investment in industrial sector.

Module 4. Poverty and Inequality (Lecture hours 7)

Poverty and Inequality: Concept and Measurement; Inequality and poverty in India: Estimates; Regional and Sectoral Dimensions; Rural Poverty and Agricultural Performrnce (Aluwalia); Causes and consequences; Poverty and Economic Reforms; Inequality development relationship; Growth and poverty reduction in the context of Indian Economy; Poverty alleviation programmes in India – Implication and ineffectiveness

Module 5. India's External Sector (Lecture hours 15)

India's foreign trade – Structure and direction; BOP and trade reforms; Foreign capital in India- composition and direction of foreign investment; Foreign capital and role of MNCs/TNCs in India, impact of FDI; India's external debt; India's foreign policy- Issues in

Export-import policy and FEMA, Exchange rate policy; WTO and India's trade reforms; Globalisation of Indian economy; Issues in competition and safety nets.

Module 6. Financial Sector **(**Lecture hours 7)

Banking sector reforms; Role of Reserve Bank of India in Indian Economic Development; Policies of the Government for financial inclusion : Revenue and expenditure of Central and State Governments; Fiscal Reforms.

Selected Readings

1. Ahluwalia. I.J. and I M D Little (Eds.) (1999) India's Economic Reforms and Development (Essays in honour of Manmohan Singh), Oxford University Press, New Delhi.
2. Bardhan, P.K. (9th Edition) (1999) The Political Economy of Development in India, Oxford University Press, New Delhi.
3. Chakravarty, S. (1987) Development Planning; The Indian Experience, Oxford University Press, New Delhi.
4. Misra, S. K. and Puri, V. K. – Indian Economy (Latest Edition)
5. Nayyar, D. 2006, 'Economic Growth in Independent India, EPW, 2006
6. Sundaram K. 2007, 'Employment and Poverty in India, 2000-05, EPW, 2007.
7. Mahendra Dev , Ravi, C, 2007, 'Poverty and Inequality : All India and States, 1983-2005, EPW, 2007.
8. Brahmananda, P.R. and V.R. Panchmukhi (Eds.) (200l), Development Experience in the Indian Economy Inter State Perspectives, Bookwell, Delhi.

Ability Enhancement Compulsory Course (AECC)

Data Analysis with R

Type of Course: AECC
Number of Credit: 2

Full Marks: 25 **Lecture hours: 30**

Course Outcome

Exploratory data analysis is an approach for summarizing and visualizing the important characteristics of a data set. It intends to develop intuition about the data set, to consider how that data set came into existence, and to decide how it can be investigated with more formal statistical methods.

1. Exploratory Statistical Analysis with tables, charts and diagram
2. Statistical analysis : Univariate and Bivariate
3. Basic Econometric applications : Classical linear regression model and diagnostics

Semester-II

Microeconomics II

Type of Course: Departmental 6 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

The students will learn the fundamental methods and theories of microeconomics of General Equilibrium and Welfare Economics and will be provided with the basic tools and concepts required to understand scientific papers at the research frontier of microeconomic theory.

Module 1. General Equilibrium (Lecture hours 15)

Walrasian eqilibrium in a pure exchange economy: Existence, uniqueness, stability; Fixed Point theorems; Core: basic idea, Walrasian equilibrium and the core, Shrinking core and Tannonement Process, Walrasian equilibrium under production.

Module 2. Welfare Economics (Lecture hours 15)

Pareto Efficiency Conditions, Pareto Efficiency and Competitive Markets, First fundamental theorem of welfare economics, Distribution and Market, Second fundamental theorem of welfare economics, Pareto optimal conditions; Optimal resource allocation; Value judgment; The role of convexity of preferences and technologies. Aggregation and Welfare Social welfare functions and Pareto criterion: Compensation Principle-Kaldor-Hicks-Scitovsky; Inability to obtain optimum welfare — Imperfections, market failure, decreasing costs, uncertainty and non-existent and incomplete markets; Theory of Second Best,: Arrow's impossibility Theorem.

Module 3. Choice under Uncertainty (Lecture hours 15)

Von Neumann- Morgenstern expected utility theory.
On utility for money: Absolute and relative risk aversion.
Applications to market demand: demand for insurance and demand for financial assets.
States of nature and Subjective probability theory; Savages sure thing principle.

Module 4: Economics of Information (Lecture hours 15)

The Principal agent problem; The lemons problem; Managers and Job Market Signaling

Selected Readings

1. Hal R. Varian: *Microeconomic Analysis* (3rd Edition), 1992, International Student Edition, W. W. Norton and Company
2. Kreps, D; A Course in Microeconomic Theory
3. Mas-Colell, Andrew. Michael D. Whinston and Jerry R. Green: *Microeconomic Theory*, 1995, Oxford University Press
4. Sadler, I.M. Castrillo and Watt, An Introduction to the Economics of Information: Incentives and Contracts, Second Edition, Oxford University Press.
5. Silberberg, E.: *The Structure of Economics: A Mathematical Analysis*, 1990, McGraw Hill, Second Edition

Macroeconomics II

Type of Course: Departmental 7 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

This course is introduced to understand how modern analytical structure developed in modern macroeconomics shape policy discourse. The course covers the ideas of disequilibrium models by the Post-Keynesian Economists in the context of Walrasian framework. New classical macro theories are also introduced. The course also contains the theories of Real Business cycles in order to capture the behavior of economic fluctuations in modern macroeconomics. Modern Macro models of Basic Infinite Horizon are also initiated. New Keynesian theories are also introduced to learn the nature of contemporary unemployment situations. The students will understand the analytical methods used in macroeconomic models and policy analysis. The course will develop the thinking of the Students to assess the policies of the Govt. pertaining to the macroeconomic environment of the economy. The paper helps the students for the preparation of National Eligibility Test, Indian Economic Service and Indian Civil Service Examinations. Those who are going to pursue research in macro policies can receive a lot from this paper.

Module 1. Keynesian Analysis in Walrasian Framework: Disequilibrium Models

(Lecture hours 15)

Incompatibility of Walras Law and Neoclassical Synthesis of Keynes's General Theory; Walrasian and Keynesian Adjustment Mechanism; Unitary Decision and Dual Decision Hypothesis: Clower; Constrained Demand and General Equilibrium Model - Barro & Grossman; Quantity Constrained Models.

Module 2. Rational Expectations and New Classical Macroeconomics (Lecture hours 15)

Role of Expectations in Macroeconomics; Adaptive Expectation & Rational Expectation Hypothesis; Rational Expectation and Policy Ineffectiveness Proposition; Lucas Imperfect Information Model and Rational Expectations; Lucas Supply Function; A Complete New Classical Macro Model

Module 3. Consumption and Investment: Basic Infinite Horizon Model

(Lecture hours 10)

The Ramsey Problem: The Keynes Ramsey Rule; The Decentralized Economy & the Command Economy; The Government in the Decentralized Economy;
Overlapping Generations Model: (a) Two-Period Lives. (b) Social Security and Capital Accumulation. (c) A Model of Perpetual Youth;
Overlapping Generations Model with Money

Module 4. Real Business Cycle Theory (Lecture hours 10)

Some Facts about Economic Fluctuations; A Baseline Real Business Cycle Model; Household Behaviour; A Special Case of the Model and its Solution; Output and Employment Fluctuations; Productivity Shocks, Consumption and Capital Accumulation; Effects of Technology Shocks; Fiscal and Monetary Policy Impacts

Module 5. New Keynesian Macroeconomics (Lecture hours 10)

Menu Costs and Real Rigidity; Efficiency wage & Unemployment; Model of Implicit Contracts; Insider-Outsider Models; Search and Matching Models.

Selected Readings

1. Romer, D.L. Advanced Macroeconomics, 3rd Edition, McGraw Hill Company Ltd., New York.
2. Levacic, R and A. Rebman , Macroeconomics; (2nd Ed, Macmillan).
3. Mankiw, N. Gregory (2000) – Macroeconomics (4th Ed, Macmillan-Worth))
4. Mankiw, N.G. and D. Romer (eds.) (1991) – New Keynesian Economics; (MIT, Cambridge)
5. Blanchard O.J. and S. Fischer. Lectures on Macroeconomics, Prentice Hall of India, 1989
6. Snowdon Brian and Vane Howard R, (2005) Modern Macroeconomics: Its Origin, Development and Current State, Edward Elgar Publishing Ltd.
7. Hall, R.E. and J.B. Taylor (1986), Macroeconomics, W.W. Norton, New York.
8. Sheffrin, S.M.(1996), Rational Expectations, Cambridge University Press, Cambridge.

Statistical Methods

Type of Course: Departmental 8 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

This course offers advanced statistical methods such as estimation and inference which are required for better understanding of econometrics.

Module 1. Random Sampling and sampling Distributions - Expectation and Standard Error of sample mean with replacement and without replacement- Standard Normal Distribution, χ^2 distribution, t- distribution and F- distribution. (Lecture hours 20)

Module 2. Statistical Inference - point estimation of parameters- unbiased estimator, consistent, sufficient and maximum likelihood estimators. MLE from ND, PD and BD- Interval estimation of parameters. (Lecture hours 20)

Module 3. Exact Tests and confidence interval for univariate normal distribution. (Lecture hours 20)

Selected Readings

1. Goon, A. M., M. K. Gupta and B. Dasgupta (1993) Fundamentals of Statistics, Vols l & 2, The World Press Ltd. Calcutta.
2. Gupta, S. C. (1993) Fundamentals of Applied Statistics, S. Chand & Sons, New Delhi.
3. Chou, Y. (1975) Statistical Analysis, Holt, Reinhart and Winston, New York Croxton,
4. Crowden and Klein (1971) Applied General Statistics Prentice Hall of India, New Delhi.

Econometrics I

Type of Course: Departmental 9 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

The present paper is devoted to equip the students with basic theory of Econometrics and the applications of the econometric methods for understanding of applied economic research. The paper includes various problems of estimation of single–equation regression models and the problems of inference. The paper will enable the students in selecting suitable model. It also analyses problems of regression with qualitative regressors and the errors of measurement in the variables.

Group A

Module 1. Single-Equation Regression Analysis (Lecture Hours 10)

(Extensions of Two-Variable and K-variable Classical Linear Regression Model); Assumptions of CLRM, Estimation of Regression Parameters (OLS & ML Estimation); Properties of Least-Squares Estimators; Coefficient of Determination and Analysis of Variance (ANOVA); Applications of Regression Analysis; The Problem of Prediction.

Module 2: Problems of Classical Regression Model (Lecture Hours 20)

Choice of Functional Forms of Regression: Log-Lin, Lin-Log and Log-Log Models; Problem of Heteroscedasticity: Nature and Consequences of Heteroscedasticity, Detection and Remedial measures of the problem, An illustrative example; Problem of Autocorrelation: Nature and Consequences of Autocorrelation, Detection and Remedial measures of the problem, An illustrative example; 2.4 Problem of Multicollinearity: Nature and Consequences of Multicollinearity, Detection and Remedial measures of the problem, An illustrative example.

Group-B

Module 3. Regression with Qualitative Regressors (Lecture Hours 8)

Dummy Variables Meaning and Use; Classification system; Dummy Variable Trap, Interpretation of Estimated Coefficients; Class-effect and Interaction-effect, Comparing dummy variable Approach with Chow Test; Use of Dummy Variables for deseasonalization.

Module 4. Errors in Variables (Lecture Hours 12)

Measurement Errors in dependent variables, Measurement Errors in explanatory Variable; The classical solution for a single equation Model with one Explanatory variable measured with error; The Single Equation Model with two explanatory variables: One Measured with Error; The Single Equation Model with explanatory Variables: Both Measured with Error; Reverse Regression; Instrumental Variable Method.

Module 5. Model Selection, Diagnostic Checking and Specification Testing

(Lecture Hours 10)

Concept of specification: Specification Error; Diagnostic Tests Based on Least Square Residuals; Tests for Omitted Variables; Model Selection; Hypothesis Testing Search; Selection of Regressors, Theil's Criterion, Akaike's Information Criterion; Error of prediction, Criteria based on Minimising the Mean Squared; Diagnostic Tests: Chow test, Ramsey RESET, Bera- Jarque test of normality of errors.

Selected Readings

1. Kmenta, J. (1997), Elements of Econometrics (Reprint Edition), University of Michigan Press, New York.
2. Gujarati, D. N., Porter, D, C., & Gunasekar, S. (2017), Basic Econometrics, McGraw Hill Education (India) Private Limited, Chennai.

3. Judge, G.G. et al., *Introduction to the theory and Practice of Econometrics, 2nd ed*., John Wiley and Sons.
4. Koutsoyiannis, A. (1977), Theory of Econometrics (2nd ed.), The Macmillan Press Ltd., London.
5. Greene William H. Econometric Analysis, Pearson Education, Asia Johnston: Econometric Method, McGraw Hill.
6. Johnston and Dinardo: Econometric Methods - Tata McGraw Hill
7. Maddala, G.S. (Ed.) (1993), Econometrics Methods and Application (2 Vols.)
8. Johnston: Econometric Method, McGraw Hill
9. Maddala G.S.(2002) Introduction to Econometrics , Wiley , India

Game Theory and Applications

Type of Course: Departmental 10 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

This course includes some basic concepts of game theory. This course will prepare them to study advanced models of game theory and theory of contract at advanced level and will also be helpful for better understanding of Industrial organization theory.

Module 1. Static Games of Complete Information (Lecture Hours 20)

Basic Theory: Normal-Form Games and Nash - Equilibrium; Applications; Advanced Theory: Mixed Strategies and Existence of Equilibrium

Module 2. Dynamic Games of Complete Information (Lecture Hours 20)

Dynamic Games of Complete and Perfect Information. Theory: Subgame Perfection; Repeated Games.

Module 3. Bayesian games (Lecture Hours 20)

Module 4. Dynamic games of incomplete information (Lecture Hours 20)

Selected Readings

1. Gibbons:, R. Game theory for applied economists, 1992, Princeton University Press
2. Maschler, M. E Solan and S. Zamir, Game Theory, Cambridge University Press, 2013.
3. Osborne, M.J. An Introduction to Game Theory, Oxford University Press 2003.

Evaluation of Public Policies

Type of Course: SEC
Number of Credit: 2

Full Marks: 25 **Lecture hours: 30**

Course Outcome

This course will help to critically evaluate public policies based on either primary or secondary data which is expected to have employment opportunities at government as well as non governmental organizations engaged in public policies practice and research.

Critical Analysis of Public policies at the centre or state level (At least two)

1. Diverse Methods for Policy analysis
2. Win-Win Analysis
3. Win-Win Example

Selected Readings

1. Handbook of Public Policy Evaluation, Stuart N. Nagel, Sage Publications

Econometrics II

Type of Course: Departmental 11 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

This course assumes that students are familiar with the simple linear regression and multiple regression analysis. The paper Econometrics-II covers some selected econometric techniques to test economic theories, estimate economic relationships, and evaluate policy using real world data. This course includes (i) Non-linear Regression Models, (ii) Qualitative response regression models, (iii) Panel data regression models, and (iv) Simultaneous Equation System. These regression models are extremely useful in applied economic research and these models also pose some special challenges. The students may learn from the course about how the models are estimated and interpreted.

Module 1. Dynamic Econometric Model/Regression with Lagged Variables

(Lecture hours 6)

Sources of Lagged Variables; Consequences of applying direct OLS in Distributive Lag models: Polynomial Distributed Lag models, Geometric Lag models, Autoregressive and distributed lag models Koyak model, Partial adjustment model; Adaptive expectations; Instrumental variables; Problem of auto-correlation: Applications under different situations; Almon approach to distributed-lag models; Causality test, Granger test.

Module 2. Nonlinear Regression Models (Lecture hours 6)

Non-Linear least Squares Estimation; Maximum Likelihood Estimation; Hypothesis Testing and Parametric Restrictions; F and Wald Statistics; Likelihood Ratio Test; Lagrange Multiplier Test; Box-Cox Transformation.

Module 3. Qualitative Response Models (Lecture hours 8)

The nature of qualitative Response Model; The Linear Probability Model (LPM) and its application; The Logit Model: Estimation of the Logit Model and its application ; Estimation of Probit Model; The Tobit Model and its application.

Module 4. Panel Data Regression Models: Introduction to Static Panel

(Lecture hours 10)

Fixed Effects

Introduction-Least Square Dummy Variable Approach; Testing the significance of the group effects, The Within and between Groups Estimators .Fixed Time and Group Effects, Unbalanced Panels and Fixed Effects.

Random Effects

Generalized Least squares, Feasible Generalized Least Squares, Testing for Random Effects , Hausman's Test for Fixed and random Effects, Unbalanced and Random Effects

Module 5. Simultaneous Equation System: Overview and Identification

(Lecture hours10)

Basic Concepts – Introduction and examples; The simultaneous equation bias and inconsistency of OLS estimators; Structural Form, Reduced Form and Final Form Models; The identification problem - Rank and Order conditions; Reduced Form approach to identification; A Test of Simultaneity: Hausman Specification Test; Tests for Exogeneity.

Module 6. Simultaneous Equation System: Methods of Estimation (Lecture hours 20)

Single Equation Methods; Recursive Models and OLS; Indirect Least Squares (ILS); Instrumental Variable (IV) estimation; Two-Stage Least Square Estimator (2SLS); Limited Information Maximum Likelihood (LIML); System Methods: Three-Stage Least Squares (3SLS), Full Information Maximum Likelihood Estimation (FIML), Seemingly unrelated regression equations (SURE).

Selected Readings

1. Balatagi, Badi. H, Econometric Analysis of Panel Data
2. Johnston: Econometric Method, McGraw Hill
3. Johnston and Dinardo: Econometric Methods - Tata McGraw Hill
4. Kmenta, J. (1997), Elements of Econometrics (Reprint Edition), University of Michigan Press, New York.

a. Greene William H., Econometric Analysis, Pearson Education, Asia.

5. Maddala, G.S. (Ed.) (1993), Econometrics Methods and Application (2 Vols.)
6. Maddala, G.S. Limited Dependent and Qualitative Variables in Econometrics, Cambridge University Press.
7. Hsiao Cheng, "Analysis of Panel Data", Econometric Society Monographs.
8. J.W. Wooldridge. *Econometric Analysis of Cross section and Panel Data*, MIT Press, 2010.
9. Maddala G.S.(2002) Introduction to Econometrics , Wiley , India.

Semester-III

Growth Economics

Type of Course: Departmental 12 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

This course is indeed to deliver basic theories of economic growth with emphasis on neoclassical growth theory and endogenous growth theory. This course requires basic foundations in dynamic optimization taught in first semester. Tis course will be useful for further empirical and theoretical research in this area.

Module 1. Exchange Based Models – Harrod's Model, Dynamic Equilibrium in Harrod's Model

(Lecture hours 15)

Module 2. Solow's Growth Model and its extensions. Technological Progress, Exogeneous, Endogeneous, Hicks Neutral, Harrod Neutral

(Lecture hours 15)

Module 3. Swan and Kaldor model of Growth

(Lecture hours 10)

Module 4. Endogenous Growth Theory of Arrow and Romer ; The Ramsay model ; Long Run Growth and Capital Accumulation ; Technical Changes.

(Lecture hours 20)

Selected Readings

1. Growth Economics- Selected Readings, Edtd by A. K. Sen, Penguin Books,
2. Barro, Robert J. and Xavier Sala-i- Martin (1995), *"Economic Growth"*, McGraw-Hill, Inc., Singapore
3. Jones, H.G (1976): *An Introduction to Modern Theories of Economic Growth*,McGraw-Hill.
4. Stiglitz, J. E. and H. Uzawa (ed.)(1969): *Readings in Modern Theory of Economic Growth*, MIT Press.

Development Economics

Type of Course: Departmental 13 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

The course is about the fundamental models used to analyze theoretical and empirical issues in Development Economics. The main purpose of the course is to familiarize students with the contemporary issues of development in underdeveloped and developing economies. The aim of the course is to develop critical and analytical thinking on the evolution of the theories of development in the context of developing economies. The course covers theoretical developments in areas of growth and economic development, economic inequality & poverty issues, rural-urban interconnections, markets for land & credit and global perspective of economic development including the role of Institutions. Students would be able to understand the problem of development issues and the related policy discourse. The course is designed in a way that students may use quantitative methodologies in their research at the regional level.

Module 1. Economic Development: Theoretical Ideas & Measurement Issues

(Lecture hours 15)

Development Theory in Historical Perspective: Growth & Development; Economics of Growth: Theoretical and Historical Perspective; Development: Meaning and Measurement; Mobility Matrix; Social Development & Basic Needs Approach; Physical Quality of Life Index (PQLI); Human Development: Development as Capability Expansion; Human Development Index (HDI), Development as Freedom, Inclusive Development; Regional Growth Differences; New Economic Geography and Growth.

Module 2. Rural -Urban Interconnections and Development (Lecture hours 10)

Rural-urban Interconnections: An Overview; Surplus Labour: Sen's Theoretical Explanation ; Surplus Labour & Economic Development :Lewis, Ranis and Fei model ; Stiglitz's Labour Turnover Model ; The Wage Productivity model ; Surplus labour and Efficiency Wage

Module 3. Income Inequality & Poverty Issues (Lecture hours 15)

Income Distribution in the Developing Countries: Problem of Income Inequality: Conceptual Issues; Measurement of Income Inequality: Different Indices; Inequality and Growth: Inverted U Hypothesis; Empirical Testing of the Inverted U hypothesis: Evidence from Different Countries; Role of Distribution and Redistribution on Growth.
Poverty - Conceptual Issues; Different Dimensions of Poverty; Measures of Poverty: Different Indices; Human Poverty & Multidimensional Poverty: Conceptual Ideas and Measurement; Poverty and Nutrition; Poverty Nutrition and Labour Markets; Economics of Poverty Alleviation

Module 4. Rural Land & Credit Markets (Lecture hours 10)

Theory of Agrarian Contracts: Ownership and Tenancy; Productivity, Efficiency and Tenancy; Rural Informal Financial System: Credit Market; Theories of Informal Credit

Markets; Credit Default & Collateral; Interlinked Transactions in Rural Markets: Rural Interlinkage; Credit Rationing; Insurance, Risk and Vulnerability in an Agrarian Economy.

Module 5: Institutions and Economic Development (Lecture hours 10)

Institutions: Function & Importance; Evolution of Institutions and New Institutional Economics; Transaction Cost; Problems of Property Rights, Externalities and Market Failure; Institutions and Role of the State, Governance & Economic Development.

Selected Readings

1. Ray, Debraj (1999): *Development Economics*, Oxford India Paperbacks.
2. Basu, K. (1997), *Analytical Development Economics*, OUP.
3. Bardhan, P. and C. Udry (1999), *Development Microeconomics*.
4. Chenery, H. and T.N. Srinivasan (Eds.) (1989), Handbook of Development Economics, Vols. 1 & 2, Elsevier, Amsterdam.
5. Hayami, Y. (1997), *Development Economics: From the Poverty to the Wealth of Nations*, Oxford:Clarendon Press.
6. Thirwal, A.P. (1999), (6th Edition), Growth and Development, Macmillan, U.K.
7. Dasgupta, Partha (1993): *An Inquiry into Well Being and Destitution*, Clarendon Press
8. Kahkonon, S. and M. Olson (2000), A New Institutional Approach to Economic Development, Vistaar.

Industrial Organization

Type of Course: Departmental 14 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

This course is based on Structure-Conduct-Performance Paradigm which is a departure from neoclassical paradigm. This course requires foundation knowledge of game theory and includes both theoretical and empirical issues in firms strategic behavior in markets. This course intends to develop a strong base on understanding the role of R &D, advertising, product differentiation in determining firm level decision. It also covers topics such as merger, concentrations, entry issues etc.

Module 1. Theory of Firm: Transactions Cost Approach-Coase(1937) and Williamson(1985), Grossman and Hart(1986)

(Lecture hours 15)

Module 2. Market Structure and Market Power; Product Differentiation: Cournot Versus Bertrand; Location Models (Linear City and Circular City)

(Lecture hours 15)

Module 3. Advertising, Strategic Behaviour, Entry and Exit

(Lecture hours 10)

Module 4. Research and Development (Lecture hours 20)

Selected Readings

1. Belleflamme, P. and Peitz, M., Industrial Organization, Cambridge University Press.
2. Cabral, Luis, Introduction to Industrial Organization, MIT Press
3. Handbook of Industrial Organization, Volume 1, 2 and 3
4. Oz Shy: Industrial Organization, MIT Press.
5. Tirole, J. Theory of Industrial Organization

Discipline Specific Elective (DSE) Courses (Any One)

History of Economic Thought

Type of Course: Departmental 15 (DSE-1)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

This course of History of Economic thought is a course on historical evolution of the ideas of economic sciences including Mercantilism, Physiocracy, Classical Political economy.

Module 1. The Beginnings : The Old Testament, Plato and Aristotle , The Middle ages and the Canon Law. (Lecture hours 10)

Module 2. The Decline of Scholasticism, Mercantilism, Thomas Mun (Lecture hours 10)

Module 3. Economic Thought of Petty, Locke, North, Law, Hume, Cantilion, Steuart; Economic Ideas of Physiocrats – Quesnay's 'Tableau oeconomique'.

(Lecture hours 15)

Module 4. The Classical System: Features; Economic Ideas of

- Smith: On Economic Development , Political Economy, Value and Distribution
- Ricardo: On value and Distribution and Growth
- Malthus: On Population and Accumulation
- Marx: On value and Surplus Value, Reproduction, transformation Process, Organic Composition of capital, Rate of Profit.

(Lecture hours 15)

Module 5. Indian Economic Thought

- Early economic ideas: Kautilya, Valluvar.
- Modern economic ideas: Naoroji, Ranade, R.C. Dutt and M.N. Roy.
- Economic ideas of Gandhi: Village, Swadeshi, place of machine and labour, cottage industries, trusteeship.

- Early approaches to planning (The national planning committee), Gadgil: cooperation as a way of life and strategy of development. (Lecture hours 10)

Selected Readings

1. Eric Roll, A history of Economic Thought, OUP
2. Blaug, Mark, Economic Theory in Retrospect, Cambridge UP
3. Dasgupta, A.K, Epochs of Economic History, Basil Blackwell
4. R. Paul, History of Economic Thought

Advanced Economic Theory

Type of Course: Departmental 15 (DSE-2)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

This advanced theory considers theory of general equilibrium, theory of contracts and game theory all at advanced level so as to orient the students towards model building.

Module 1. Arrow Debreu Equilibrium and Radner Equilibrium under contingent assets (Lecture hours 10)
Module 2. Contract Theory (Lecture hours 15)
Module 3. Bargaining Game (Lecture hours 10)
Module 4. Mechanism Design (Lecture hours 10)
Module 5. Auctions (Lecture hours 15)

Selected Readings

1. Bernard Salanie', The Theory of Contracts, MIT Press, Second Edition
2. Mas-Colell, Andrew. Michael D. Whinston and Jerry R. Green: *Microeconomic Theory*, 1995, Oxford University Press

Operations Research

Type of Course: Departmental 15 (DSE-3)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

Operational Research (OR) is a discipline which deals with advanced analytical methods for better decision making and problem-solving in the system of management of organisations. The subject of OR spread over other disciplines like Mathematics, Statistics, Information

Technology, Economics, Engineering, etc. It deals with the application of scientific methods for decision-making, and especially to the allocation of scare resources. This course provides a unique blend of theories of decision making and practices on different fields to improve efficiency of the system of organisations. From this course the students are able to know real world problems and develop their practical skills to solve different complex scenarios.

Module 1: Introduction to Operation Research and Review of Mathematics

(Lecture hours- 15)

Origin and Scope of Operational Research; Linear combination; Linear dependence and independence; Concept of vector and matrix, Concept of Vector space, matrix space and Euclidean space; Concept of spanning set and basis; Concept of convex combination and convex set; Concept of extreme point

Module 2: Theorem of Linear Programming (Lecture hours- 15)

Concept of the primal and the dual; Weierstrass's Theorem; Fundamental Lemma; Existence Theorem; Duality Theorem; Equilibrium Theorem; Economic Interpretation of Equilibrium Theorem

Module 3: Linear programming (Lecture hours- 15)

Standard and Canonical Form of LP Problem; Nature of feasible, basic and optimal solution; Theory of Simplex Method; Simplex Algorithm – Maximisation Case, Minimisation case; Solution of linear programming problem through graphical and simplex method; Applications.

Module 4: Non-Linear Programming (Lecture hours 15)

Kuhn-Tucker optimality conditions; Kuhn-Tucker Sufficiency theorem; Economic Interpretation of non-linear programming; Duality in non-linear programming; Applications.

Selected Readings

1. Dorfman, Samuelson and Solow, Linear programming and Economic Analysis, Dover, 1958.
2. Dimitri Bertsekas, Non-Linear Programming, Atlanta Scientific, 2000
3. Hadley, G. (1962) Linear Programming, Addison Wesley, Publishing Co. Massachusetts.
4. Lancaster, K Mathematical Economics, 1975.
5. Taha, H.A., Operations Research An Introduction, 1976. 4/e, Macmillan Pub.

Generic Elective Course (GEC)

Contemporary Issues in Indian Economy

Type of Course: Generic Elective Course (GEC)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

The course introduces contemporary issues in Indian Economy. It emphasizes on understanding of sector-specific issues and policies. The paper mainly covers issues in Indian agriculture, industry, services, external sector, financial sector, and. social sector development. The focus of the course is on the growth and development of Indian Economy and to aware of the students regarding recent trends in major economic and social indicators and policy debates in India. The various problems of social sector like issues of poverty, unemployment, food security etc. are included. It also highlights major policy debates and examines India's empirical experiences. The major objectives of the course are to equip the students with different research questions on Indian Economy, to provide deeper conceptual understanding of the subject, to know methods of empirical research, different sources of database and to enhance ability of the students to draw policies for growth and development of Indian economy.

Module 1. Issues in Indian Agriculture (Lecture hours 15)

Trends in agricultural production and productivity, diversification of agriculture, technological change in agriculture, agricultural workers, agricultural price policy, agricultural marketing, agricultural trade and WTO, Food security and rural livelihoods. Database for agricultural research.

Module 2. Issues in Indian Industry (Lecture hours 10)

Growth performance of Indian industries since 1991, Role of public and private sector, Small scale and cottage industries, New Industrial Policy, Role of ICT in industrial development, Foreign Companies in the industrial sector – their contribution in investments, exports, technology and employment. Database: Industrial Survey of India (ASI).

Module 3 Issues in Indian Labour Market (Lecture hours 10)

Labour force participation, Problems of unemployment and underemployment, Gender and work, workers in informal economy, skill and unskilled workers, Human capital-education and training, Globalisation and labour mobility, development, displacement and labour migration. Data sources- NSSO and Census.

Module 4 Issues in Financial sector (Lecture hours 8)

Indian Budget-Fiscal and Monetary policies -Definition, components, receipts, revenue and capital account, tax revenue, Public Debt and Government expenditure. Central –State Finance relations. Planning Commission of India and NITI Aayog.

Module 5 Issues in External sector (Lecture hours 7)

Composition and Direction of Foreign trade in India, Foreign capital and FDI in India, EXIM policy in India.

Module 6 Problems of poverty, inequality and Human Development (Lecture hours 10)

Definitions and measurements problems of poverty, Income Poverty and Human Poverty, distribution and deprivation, Income inequality, regional inequality, Human Development Index, Human Deprivation Index, Poverty eradication programmes, Role of MGNREGA, Resource allocation policies of the government. Public Distribution System in India.

Selected Readings

1. K. Basu, An economist in the real world: the art of policymaking in India. 2016, Viking.
2. S. K. Misra and V. K. Puri – Indian Economy (Latest Edition)
3. Rudder Dutt and KPM Sunderam – Indian Economy (Latest Edition)
4. Economic Survey, Ministry of Finance, Government of India, Various editions.
5. Uma Kapila, Indian Economy since Independence (edited).

Selected articles on relevant topics on Indian Economy from (i) Economic and Political Weekly, (ii) Indian Journal of Agricultural Economics, (iii) Indian Journal of Labour Economics, (iv) American Journal of Agricultural Economics, (v) Journal of development studies etc. are also suggested.

Semester-IV

Econometrics II

Type of Course: Departmental 16 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

This course has two parts the first one is an applied course in data analysis attached with the econometric techniques and the second part is time series analysis both considering theory and applications. The purpose of this course is to provide the students with the econometric tools and techniques and practical experience necessary to do applied econometric research. Hands-on practice in data analysis will be provided using the statistical softwares. The focus is on conceptual understanding and 'hands on' applications using economic data drawn from real-world examples, rather than on formal theoretical proofs alone. By the end of the course, students should be able to develop simple econometric models and to estimate and interpret the econometric and statistical results reported in other studies. Students may also be able to use quantitative measurement techniques in their research problems at the regional level.

Group A

Module 1. Exploratory Data Analysis & Application of Econometric Techniques

(Lecture hours 10)

Module 2. Functional Estimation: Problems & Techniques (Lecture hour 10)

(a) Consumer's Demand Analysis, Demand Functions and Theoretical Restrictions; Specification and Estimation; Engel Curve & Estimation of Engel Elasticities; Estimation of complete Demand System: LES, AIDS.
(b) Estimation of Production Function: Problem of Identification and Bias, Specification and Estimation. Estimation of Cobb-Douglas, Leontief & CES Production Function.
(c) Specification and Estimation of Money Demand Function; Partial Stock Adjustment and Optimum Money Demand; Estimation of Long Run & Short Run Elasticities.
(d) Application of Panel Data Econometrics.

Module 3. Quantitative Measurement Techniques (Lecture hour 10)

Measuring Diversification: Indices & applications; Measures of Economic Inequality: Different Indices, Implications and Applications; Measurement of Income Poverty: Different Dimensions; Measuring Relative Deprivation; Multidimensional Poverty: Quantitative Measurement & Applications; Measuring Gender Discrimination, Measures of Development– HDI, IHDI, HPI, Etc.

Selected Readings

1. Desai M. Applied Econometrics
2. Intrilligator, M.D. (1978), Econometric Methods, Techniques and Applications, Prentice Hall, Englewood Cliffs, New Jersey.
3. Raw and Miller. R.L., Applied Econometrics, PHI, Delhi, 1959.
4. Measurement of Inequality and Poverty, S. Subramanian ed. Oxford University Press
5. *Fukuda-Parr, S. and A. K.* Shiva Kumar (eds.) (2003): *Readings in Human Development*, Oxford University Press.
6. G.G Judge et.al., *The Theory and Practice of Econometrics*, John Wiley and Sons, New York.

Group B

Time Series Econometrics (Lecture hour 10)

Module 1. Stationary Time Series Models ; Time series and stochastic process ; Time domain vs. frequency domain, Strict stationary vs. weak stationary, White noise processes, Autoregressive processes (AR), Moving Average processes (MA), ARMA models, Stationarity and invertability restrictions for an ARMA(p,q) model, Autocorrelation function (ACF) and correlogram: AR(1), AR(2), MA(1), MA(2), ARMA(1,1), Partial autocorrelation (PACF) : AR(1), AR(2), MA(1), MA(2), ARMA(1,1), Sample autocorrelation function (SACF) and Sample partial autocorrelation (SPACF), Box Jenkins Model Selection Forecast function Seasonality ARIMA modelling

Module 2 : Testing for trends and Unit roots (Lecture hour 10)

TSP vs. DSP; Unit root processes; Dickey-Fuller Tests; Extensions of the DF test: Augmented Dickey-Fuller (ADF) test; Nelson and Plosser (1982) data; Power problem of the ADF test; Phillips-Perron test: Concept only

Module 3: Spectral Properties of Stationary models (Lecture hour 5)

Periodogram of a time series, Spectrum and spectral density function, Simple example of spectral density function

Module 4: Multi - equation Time Series models (Lecture hour 5)

Intervention Analysis, Transfer function models, Estimating a transfer function; The Impulse response function

Selected Readings

1. Box, Jenkins and Reinsel , Time Series Analysis
2. Enders, W. Applied Econometric Time Series
3. Maddala and In-Moo Kim Unit Roots, Structural Change and Cointegration
4. Mills, T.C. Time Series for Economists

Public Economics & Social Sector

Type of Course: Departmental 17 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

The first part of the course covers elements of public economics and the second part of the course includes different issues of economics of social sector. Education and health are the two important social dimensions of human development. The different models of demand for education and supply of education are included. The paper also covers demand and supply of health care, resource allocation in the health sector both public and private sector, evaluation of benefits and costs of health services, financing of health services and role of government and institutions for development of social sector. The course emphasizes on the macroeconomic and microeconomic studies of impact of education and health. The course will enrich the students with theoretical as well as empirical studies on economics of social sector focusing on role of public finance and human capital on economic growth.
Group A: Public Economics

Group-A
Public Economics

Module 1. Introduction: Public Sector and Private Sector- Targets and instruments of public sector- Public Good, Private good, Club and local public goods-Justification of public sector-Market vs. Government-Development Models of Public Sector Growth- Wagner's Law and Baumol' law (Lecture hour 10)

Module 2. Structures of Government Expenditure & Revenue with examples from Indian Economy- Basic Objectives of Government Budget-Revenue Budget and Capital Budget: Different concepts of Budget Deficits. (Lecture hour 7)

Module 3. Grounds for Income Taxation_ Determining Taxable Income- Concepts of tax evasionand tax avoidance: Effect of income tax on savings- Incidence of Sales Tax, Value Added Tax and Excise Duty-Deadweight loss. (Lecture hour 8)

Module 4. Borrowing and its economic effects- Incidence of Borrowing – Public Debt and its impact on society and future generation. . (Lecture hour 5)

Selected Readings

1. Musgrave& Musgrave- Theory of Public Finance
2. Due & Friendlander_-Government Finance
3. Ulrich-Public Finance
4. Hindricks & Myles_ Intermediate Public Economics
5. Mukherjee, Ghose & Nag- Analytical Public Economics
6 Johansen : Public Economics

Group B
Economics of Social Sector

Module 1. Economics of Education (Lecture hour 15)

Education as an instrument for economic growth; Human capital - Human capital vs. Physical capital, components of human capital; Demand for education - private demand and social demand, Determinants of demand; Cost of Education - Expenditure on education, private costs and social costs; Benefits of education - Direct and indirect benefits, private and social benefits; Cost-benefit analysis, production function models, Manpower requirements approach, programming and input-output models; Education and labour market -Effects of education, ability and family background on earnings, poverty and income distribution, education and employment; Relation between education market and Labour Market; Different Models of Education ; Rate of Return vs Fixed Coefficient Model; Microeconomic Analysis of the Return to Education, Social versus Private Returns to Education in Macro Growth Models, Empirical Macro Growth Equations.

Module 2. Health Economics (Lecture hour 15)

Health dimensions of development; Measurement of Health; Determinants of health - poverty, malnutrition and environmental issues; Economic dimensions of health care - demand and supply of health care; Financing of health care and resource constraints; The concept of human life value; Theory and empirical studies of production of health care; Inequalities in health - class and gender perspectives; Institutional issues in health care delivery; Health infrastructure provisions both public and private sector - health policy.

Selected Readings

1. Becker, G.S. (1974), Human Capital (2nd Edition), National Bureau of Economic Research, New York.
2. Blaug, M. (1972), Introduction to Economics of Education, Penguin, London.
3. Mikael Lindahl & Alan B. Krueger, 2001. "Education for Growth: Why and for Whom?," Journal of Economic Literature, American Economic Association, vol. 39(4), pages 1101-1136, December.
4. Woodhall, M. (1992), Cost Benefit Analysis in Educational Planning, UNESCO, Paris.
5. Dasgupta, M., Chen, L.C. and Krishnan, T.N. - Health, Poverty and Development in India (ed.), Delhi, Oxford University Press, 1998.
6. Feldstein, M. S. (1977), Economic analysis of Health Service Efficiency, NorthHolland, Amsterdam.
7. National Family Health Survey (various issues)
8. World Health Report 2000, WHO, Geneva.

Financial Economics

Type of Course: Departmental 18 (Core)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

This course is an introductory course for financial economics including both corporate finance and investment issues. This course will deliver some aspects of mathematical finance and deals with frontier areas of financial economics such as derivatives, options, futures etc.

Group-A

Module 1. Introduction to Finance and Financial System: Finance and the Role of Financial Institutions, Financial Markets and Financial Instruments; Basic Ideas of Corporate Finance - Principal Agent Problem; Basic Ideas of Finance and Financial Liberalization in the Age of Globalization – Concept of Securitization; Indian Financial System – Basic Ideas, Concepts, Relevant Markets, Institutions and Financial Instruments. (Lecture hour 5)

Module 2. Financial Statements - Balance Sheet, Income Statement, Working Capital Statement and Financial Cash Flow Statement; Time Value of Money.
(Lecture hour 5)

Module 3. Risk and Return - Portfolio Diversification; Valuation of Securities - Bond Market and Stock Market. (Lecture hour 5)

Module 4. Capital Budgeting along with analysis of different Investment Criteria – NPV Criterion, Benefit-Cost Ratio Criterion, Internal Rate of Return Criterion, Payback Rule and Accounting Rate of Return Criterion, Cost of Capital, Dividend Policy; Introduction to Derivatives – Forward Contracts, Futures, Options and Swaps (Only rudimentary ideas).
(Lecture hour 15)

Selected Readings

1. Principles of Corporate Finance - Brealy and Myers
2. Corporate Finance – Ross, Westerfeld and Jaffey
3. Investment – Sharpe, Alexander and Bailey
4. Financial Institutions and Markets: Structure, Growth and Innovations - L. M. Bhole
5. Financial Markets and Institutions: Global Edition - 7th Edition - Frederic Mishkin, Stanley Eakins
6. The Economics of Money, Banking and Finance - 4th Edition - Peter Howells, Keith Bain
7. Introduction to Futures and Options - John C. Hull
8. International Finance - Maurice D. Levi

Group-B

Module 1. Portfolio selection: Efficiency set theorem – concavity of efficiency set- choice of optimal portfolio – portfolio diversification- lending under risk- free rate - Lending and borrowing under risk free market – market model. Bonds: Basic concepts, Types of bonds, Bond valuation, Yield – to – Maturity.

(Lecture hour 10)

Module 2. Financial Derivatives - Future and options - Basic concepts - Marketing - to - market principle - Determinants of value of option – Futures and Options vs. Forward Contract - Pay-off profiles of Futures and Options

(Lecture hour 5)

Module 3. Efficient Market Hypothesis- Concept, forms-Random walk model and Martingales- Portmanteau tests- Variance ratio tests-Predictability and nonlinearity-BDS test

(Lecture hour 5)

Module 4. Volatility- Historical, Implied and Stochastic volatilities- ARCH, GARCH-Asymmetry- EGARCH and TGARCH, Modeling Long run relationships- Cointegration, Engle and Granger test, Johansen trace test, Granger Representation Theorem-Error correction model- Granger causalty, Switching Models- SETAR, STAR Jmulti software.

(Lecture hour 10)

Selected Readings

1. Campbell, Lo and MacKinlay: The Econometrics of Financial Markets
2. Brooks, Chris: Introductory Econometrics for Finance

Discipline Specific Elective (DSE) Courses (Any One)

Ecology and Environment

Type of Course: Departmental 19 (DSE-1)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

The course is a course on ecology and environmental economics. This course follows a mathematical approach to modeling several issues in environmental economics as well as some policy related issues such as pollution tax and tradable permits.

Module 1. Cost efficient rule for pollution control – Equality of Marginal Abatementcosts (MACs); Taxation for pollution control - Efficient control of pollution under a pollution tax - advantages of a pollution tax; The basic theory of Tradable Pollution Permits (TPPs) and the least – cost, property of such permits; The Coase theorem.

(Lecture hours 15)

Module 2. The Economics of Sustainable Development - Weak Vs Strong Sustainability - Economic Indicators of Sustainability; Green Growth and economic growth model; The Economics of Non-renewable Resources - Socially Optimal Extraction; Renewable Resources: A Static Economic Model of the Fishery - The Dynamic model of Fishing - Continuous -time Dynamic Optimization - Optimal harvest; Natural Resource and Economic Growth - Solow model of Economic Growth and Romer Endogenous Growth model; Valuation of Environmental Resources

(Lecture hours 20)

Module 3 Climate Change and Economic Growth in Developing countries - The Cass-Koopmans Optimal Growth model- Implications of the climate change induced impacts on factors of production say labour and capital in a Cass- Koopmans model.

(Lecture hours 15)

Module 4 Social, Economic and Environmental aspects of Community Forestry in India - Case studies in South Asia and Africa - Deforestation and Forest Policies in India.

(Lecture hours 10)

Selected Readings

1. Nick Hanley, Jason F. Shogren and Ben white: Environmental Economics, (Macmillan India)
2. Ulganathan Sarkar : Environmental Economics in the Theory and Practice -
3. Franck Lecocq and Zmarak Shalizi : How Might Climate Change affect Economic growth in Developing Countries, Policy Research Working paper, 4315, The World Bank
4. Michael Toman : The Roles of the Environment and Natural Resources in Economic growth Analysis, Discussion Paper 02-71, May 2003, Resources for the Future
5. Economic Policy Research Unit, University of Copenhagen - Thorvaldur Gylfason and Gylfi Zoega.Costanza, R., D' Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., Limburg, K., Naeem, S., O'Neill, R.V., Paruelo, J., Raskin, R.G., Sutton, P., van den Belt, M. (1997). The Value of the World's Ecosystem Services and Natural Capital. Nature 387, 253-260.
6. Pearce, David W. (2001). The Economic Value of Forest Ecosystems. Ecosystem Health , 284-298.
7. Pearce & Turner – Economics of Natural Resources & the Environment.
8. Kolstad – Environmental Economics.

Agricultural Economics

Type of Course: Departmental 19 (DSE-2)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

This course will enable the students to understand the economy of farm household by teaching various models of agriculture economics. The course will focus on various agrarian institutions to understand the working of agrarian economy. Moreover the paper will

highlight on different types of agriculture factors of production namely land, labour, credit and their characteristics. The course will throw light on sustainable agriculture development and will provide an overview of agriculture development in other countries.

Module 1. The farm household Models (Lecture hours 15)

Chayanov farm household model - Extention of Chayanov's model incorporating labour market. New Home Economics: - Essential Features of New Home Economics The Barnum-Squire Farm Household Model; The Low Farm Household Model, Women in the peasant household; Time Allocation and the economic role of the farm women; Scope of new Home Economics.

Module 2: Theory of Agrarian Institutions (Lecture hours 20)

Tenancy, Rent, Cost & Risk sharing; Models of Share Cropping; Problems of marginal and small farmers. Credit market imperfection; Role of capital and rural credit; Organized and unorganized capital market; Characteristics and sources of rural credit- Potential risk and the emergence of Interlinkage; Partial equilibrium in an interlinked market; Interlinkage and Intertemporal Earnings Approach - Moral Hazard and Interlinkage; Institutional and non-institutional Role of Agricultural Marketing; Marketing efficiency, Marketing margins, price spreads, market structure and market imperfections; Marketed and marketable surplus Marketing and government policy.

Module 3: Agricultural Labour Market (Lecture hours 10)

Interlinkage of labour markets; Mobility of labour and segmentation in labour markets; marginalization of rural labour; Nature, extent and trends in rural unemployment; Agriculture wages.

Module 4: Sustainable Agricultural Development (Lecture hours 10)

Optimal use of natural resources and sustainable growth in agriculture; Problem of Soil degradation and water management; Theoretical models relating to sustainable agricultural development; Public Policy for Agricultural Growth and resource management.

Model 5: Experiences of Agriculture Development in other countries (Lecture hours 5)

Selected Readings

1. *Agrarian Studies: Essays on Agrarian Relations in Less-Developed Countries* Edited by V.K. Ramachandran and Madhura Swaminathan, New Delhi: Tulika Books. 2002. ISBN 81-85229-57-0
2. Agricultural Markets From Theory To Practice: Field Experience In Developing Countries by Barbara Harriss-White
3. Ellis, Frank, Peasant Economics, 2nd Edition, 1993.
4. Akram-Lodhi, A. Haroon, and Cristobal Kay (eds.) (2009), Peasants and Globalization: Political Economy, Rural Transformation and the Agrarian Question, Routledge.
5. Scott, James C (2008), The Moral Economy of the Peasant: Rebellion and Subsistence in Southeast Asia, Yale University Press.
6. Debraj Ray, Development Economics, Chs. 11 to 14, OUP, 1998. Pranab Bardhan, The Economic Theory of Agrarian Institutions, OUP, 1989.
7. Pranab Bardhan and Christopher Udry (eds.), Development Microeconomics, OUP, 1999.
8. Select Journal papers as recommended by the Course Instructor.

Law and Economics

Type of Course: Departmental 19 (DSE-2)
Number of Credit: 4

Full Marks: 50 **Lecture hours: 60**

Course Outcome

The new interdisciplinary field of law and economics is the application of the theories and empirical methods of economics to the legal system. A scientific theory of behaviour, economics provides a useful normative standard for evaluating law and policy. Economics predicts the effects of policies on efficiency and distribution. Economic analysis often takes for granted such legal institutions as property and contract, which dramatically affect the economy. The course focuses on conceptual idea of law and economics, economic analysis of property law, contract law, tort law, and competition law. The course deals with the explanation of established links between the subjects of Economics and Law, and development of efficient rules and regulations. Students wish to undertake research programme in future will be able to grasp ideas of this new field of interdisciplinary research.

Module 1: Introduction to Law and Economics (Lecture hours 10)
Economic Analysis of Law: An Introduction; Relationship between law and economics; Economic Concepts and their relevance to Law; Legal Concepts - The Common Law and the Civil Law Traditions; Development of efficient Rules: Selected Cases

Module 2: Theories of Conflict & Efficient Outcome (Lecture hours 10)
Externalities, Transaction Costs, Coase Theorem; Efficiency Hypothesis & Invariance Hypothesis.

Module 3: Economic Analysis of Contract & Tort (Lecture hours 15)
Economic Theory of Contract - Perfect & Imperfect Contracts; Economics of Remedies for Breach of Contract; The problem of Credibility; The Foreseeability Rule in Contract Law; Economics of Torts; Economics of Tort Liability - Liability v. Regulation; Economic approach to Contract law & Tort law in India

Module 4: Economics of Property Rights (Lecture hours 15)
Introduction: An Economic Theory of Property, Economics of Property Law - Market &Non-market strategies; Allocation of Property Rights; Establishment of Entitlements; Intellectual Property Rights**:** Patents, Copyrights; Salient features of Indian Property Laws.

Module 5: Economic Analysis of Competition Law (Lecture hours 10)
Economic Theory of Competition Law; Workable Competition: Structure- Conduct-Performance; Competition as Dynamic Process; Vertical Price Fixing; Predatory Pricing: Lowering Prices; Collusion, Transaction Cost Approach, Theory of Contestable Markets; Competition Policy in India.

Selected Readings

1. Cooter Robert & Ulen Thomas- Law and Economics (5th Edition 2007) (Available for downloading at https://scholarship.law.berkeley.edu/books/2/)

2. Posner Richard A – Economic Analysis of Law (7th Edition 2007)
3. Shavel Steven – Foundation of Economic Analysis of Law (2004)
4. Harison Jeffrey L. & Theeuwes Jules - Law and Economics (2008)
5. Polinsky Mitchell A.- An Introduction to Law and Economics (2003)
6. Micali Thomas J.- The Economic Approach to Law (2009)
7. Hirsch Werner Z. - Law and Economics (1999)

Project Work through Field Survey

Type of Course: Departmental 20 (Core)
Number of Credit: 8 (Dissertation: 4 Credits; Presentation: 4 Credits)
Full Marks: 100

Course Outcome

This purpose of this course is to expose the students with field level experience. Students will be able to apply field survey techniques for collection of data. They will learn to formulate the research problems, to collect necessary data and to apply proper statistical and econometrics techniques to analyze the data.

Dissertation & Presentation (50+50 Marks)

Students will have to prepare a project report/dissertation using data collected from the field. The project report will be evaluated by the departmental teachers and External Expert (s). Students have to give a presentation and to appear at a viva-voce. During the presentation and viva-voce, external Expert(s) will be present along with the departmental teachers for evaluation. Students will have to prepare the project dissertation on the basis of their analysis and findings from the data.