

**DEPARTMENT OF ECONOMICS: :GAUHATI UNIVERSITY**  
**SYLLABUS OF MA/MSc IN ECONOMICS UNDER CBCS**  
*(Effective from January, 2018)*

<b>Course Code</b>	<b>First Semester</b>
ECO 1016	Principles of Microeconomics (C)
ECO 1026	Elements of Macroeconomics (C)
ECO 1036	Quantitative Orientation *(C)
ECO 1046	Elements of Development Economics(C)
ECO 1054	Statistical Software for Data Analysis*[VA]
<b>Course Code</b>	<b>Second Semester</b>
ECO 2016	Advanced Microeconomics (C)
ECO 2026	Macroeconomic Theory and Policy (C)
ECO 2036	Quantitative Tools*(C)
ECO 2046	Development Economics : Theory and Practice(C)
ECO 2054	Quantitative Aptitude and Test of Reasoning [VA]

<b>Course Code</b>	<b>Third Semester</b>
ECO 3016	Elements of Econometrics*( <i>C</i> )
ECO 3026	Public Finance ( <i>C</i> )
ECO 3036	International Economics( <i>C</i> )
ECO 3046	Financial System [ <i>E</i> ]
ECO 3056	Industrial Economics[ <i>E</i> ]
ECO 3066	Environmental Economics[ <i>E &amp; O</i> ]
ECO 3074	Project Formulation and Execution [ <i>VA</i> ]
<b>Course Code</b>	<b>Fourth Semester</b>
ECO 4016	Indian Economy in the Global Context( <i>C</i> )
ECO 4026	Demography [ <i>E</i> ]
ECO 4036	Operations Research* [ <i>E</i> ]
ECO 4046	Econometric Methods*[ <i>E</i> ]
ECO 4056	Model Building and Simulation in Economics*[ <i>E</i> ]
ECO 4066	Agricultural and Resource Economics[ <i>E</i> ]
ECO 4076	Financial Operations & Management♦[ <i>E</i> ]
ECO 4086	Indian Economy: Post Independence Evolution and Present Perspective [ <i>O</i> ]
ECO 4106	Economics of Health [ <i>E</i> ]
ECO 4116	Environment and Energy Economics [ <i>E</i> ]
ECO 4094	Research Methodology for Social Science[ <i>VA</i> ]

Notes:

1. The first digit indicates the semester, the next two the course number and the fourth the credit per week the course carries
2. There will be four courses per semester plus a non-graded Value Added Course
3. (*C*)= Core, [*E*] =Elective, [*O*]=Courses open for students of other disciplines  
[E-*O*] = Elective and Open for students of other disciplines  
[*VA*]= Value Added Course  
(Please refer to Clause 4a of CBCS regulations for details)
4. \*These Papers will involve exercises using computers
5. ♦Paper ECO 4076 is available only for those students who had taken up Financial System (ECO 3046) in the third semester.

# **ECO 1016**

## **Principles of Microeconomics**

### **Unit - 1: Theory of Production and Cost**

Production function and related concepts – Isoquants and Substitution between Factors – Elasticity of Substitution – Returns to Scale and Returns to a Factor – Technical Progress and Production Function – Forms of Production Function; Cobb-Douglas, CES and Fixed coefficient Type – the Ideas of Partial and Total Factor Productivity - Single Decision of a Firm; Choice of Optimal Factor Combination – Expansion Path – Derivation of Cost Function from Production Function – Multi-product Firm: production Efficiency Locus, Production Possibility Frontier and Choice of Optimal Combination of Output of Products

### **Unit - 2: Analysis of Consumer's Choice**

A Review of Indifference Curve and Revealed Preference Approach – Violation of the Premises of Indifference curve Approach: Satiation and Lexicographical Ordering – Indirect Utility Function – Dual Properties of Utility and Expenditure Functions, Ray's Identity-ordinary and compensated demand curves and measures of welfare change – Linear Expenditure System.

### **Unit - 3: Market Structure and Pricing of Products**

A Review of Perfect Competition Equilibrium – Monopoly and its Regulation – Monopolistic Competition: Price-Output Equilibrium – Duopoly Models of Cournot, Bertrand and Stackelberg – Kinked Demand Curve Model of Oligopoly – Collusive Oligopoly: Price Leadership Models.

- Contestable Markets.

### **Unit - 4: Business Accounts and Managerial Theories of the Firm**

Profit and Loss Account, Balance Sheet and Cash Flow Statements of a Firm, Break Even Analysis; A critique of the Traditional Theories of Firm –Contributions of Baumol, Morris and Williamson to Managerial Theories of the Firm

### **Course Outcomes**

- To examine the theoretical developments in the working of the firm producing a single product and multiple products
- To analyse the behaviour of the consumer
- To explain and analyse the working of markets operating at differing levels of competition.

- To differentiate and analyse the various financial statements of a firm.
- To compare and contrast the managerial theories of the firm with the traditional theories.

### **Recommended Readings:**

1. Anindya Sen, “Microeconomic Theory”, Oxford University Press.
2. Koutsoyiannis, A., “Modern Microeconomics”, Macmillan.
3. Madalla and Miller, “Microeconomics”, McGraw Hill.
4. Mukherjee, S., “Business and Managerial Economics”
5. Pindyck, R. & Rubinfeld, D.L., “ Microeconomics”
6. Ryan and Pearce, “Price Theory,” Macmillan.
7. Snider and Nicholson, “Microeconomics”

## **ECO 1026 Elements of Macroeconomics**

### **Unit - 1: A Review of Aggregate Income and its Determination**

The Ideas of Income, Domestic Income and National Income; GDP as a Production Total and its sectoral composition, NDP as an Income Total, the Circular Flow and GDP as an Expenditure Total; Introduction to Equilibrium and Disequilibrium in the Macro-economy; Classical Model of Full Employment; Keynes Criticism of Classical theory, The Simple Keynesian Framework and the Multiplier

### **Unit - 2: Income Determination with Money Market**

Liquidity Preference and the Rate of Interest; the IS-LM framework and Policy Analysis, IS-LM Model with Flexible Prices; Real Balance Effect and Patinkin’s Full Employment Equilibrium

### **Unit - 3: Consumption Function**

The Consumption Function Puzzle; The Relative Income Hypothesis; The Permanent Income Hypothesis; The Life Cycle Hypothesis; Random Walk Hypothesis; Consumption Theories and Policy Implications

#### **Unit - 4: Investment and Business Cycles**

Firm Business Investment: The Rental Price of Capital, the Cost of Capital and Determination of Investment; Residential and Inventory Investment: nature and determinants; the Accelerator Model; Business Cycles as Multiplier Accelerator Interaction Process

#### **Unit - 5: Open Economy Macroeconomics**

The Exchange rate and its Determination; Balance of Payment and its Adjustment under Fixed and Flexible Exchange Rate Regimes, Effectiveness of Devaluation; The Open Economy IS-LM Model; Capital Flow and the Mundell-Fleming Model; Foreign Trade Multiplier

#### **Course Outcomes**

- To elaborate on the basics of National Income accounting and Income-Employment Determination Process
- To interpret the complications of macroeconomic policy making in closed and open economy frameworks
- Link macroeconomic theory to micro foundation of consumers' choice and firms' investment decisions

#### **Recommended Readings:**

1. Brian Snowdon and H R Vane, Modern Macroeconomics
2. Don Patinkin, D., Money, Interest and Prices
3. Levacic and Rebman: Macroeconomics: An Introduction to Keynesian Neo-Classical Controversies
4. N. Gregory Mankiw, Macroeconomics
5. Ola Olson, Essentials of Advanced Macroeconomic Theory
6. Raghavendra Jha, Macroeconomics for a Developing Economy
7. Soumen Sikdar, Principles of Macroeconomics

## **ECO 1036 Quantitative Orientation**

#### **Unit - 1: Classical Optimization**

Unconstrained maxima and minima with a single explanatory variable – applications to cost minimization, revenue maximization, tax revenue maximization, profit maximization and equilibrium of firm, Unconstrained maxima and minima with more than one explanatory variables –

applications to discriminatory monopoly, Multiproduct equilibrium, Multiplan equilibrium, equilibrium of firm with advertisement cost and subsidy.

### **Unit – 2: Optimization with Equality Constraint**

Optimization with equality constraints, Lagrange’s multiplier method – application to consumer’s equilibrium and producer’s equilibrium in factor market

### **Unit – 3: Integration**

Applications relating to derivation of total functions from marginal functions, estimation of consumer’s surplus, producer’s surplus, problems relating to investment, capital formation and derivation of simple growth process (Domar).

### **Unit - 4: Matrix Algebra and its Applications**

Rank, Norm and Trace of a matrix, Partition matrix, Matrix inversion, Structure of input-Output table, Static Leontief system –Domestic and External sector

### **Unit – 5: Probability: Basic Ideas**

Axiomatic Definition and derivation of Basic Probability Rules – Conditional Probability, Baye’s Theorem (Concept only) – Random variable – Mathematical Expectation and Moments relating to Discrete random variables

### **Unit – 6: Theoretical Probability Distributions**

Binomial, Poisson and Normal Distributions with Properties – Moment Generating Function – The Central Limit Theory (without Proof).

### **Course Outcomes**

- To elaborate on the use of basic mathematical tools such as matrix, differentiation and integration in economics.
- To discuss how these tools can be applied in economics.
- While going through this course, students will have an idea of using the quantitative technique in Microeconomics, Macroeconomics and other fields of economics.
- To prepare the student to analyse economic theory in an empirical way.

### **Recommended Readings:**

1. A.C. Chiang, “Fundamental Methods of Mathematical Economics”, McGraw Hill.

2. Gupta, S.C. and Kapoor, U.K., “Fundamentals of Mathematical Statistics”
3. Hooda, P.R., “Statistics for Business and Economics”, Macmillan.
4. Hoy. M. and others: Mathematical Economics
5. J. M. Henderson and R. E. Quandt, “Micro-economic Theory – A Mathematical Treatment.”
6. Mouhammed, “Introduction to Mathematical Economics”, Prentice Hall of India
7. Nagar, A.L. and Das, R.K., “Basic Statistics”, Oxford.
8. R.G.D. Allen, “Mathematical Analysis for Economists.”
9. S. Baruah, “Basic Mathematics and its Economics Applications”, MacMillan.
10. Salvatore, Dominick and Reagle, Darrick, “Statistics and Econometrics”, TMH
11. Yamane, Taro, “Statistics – An Introductory Analysis”.

## **ECO 1046**

### **Elements of Development Economics**

#### **Unit – 1: Development and its Measurement**

Problems in Defining Economic Development, Per Capita Income as an Index of Development, Alternative Measures of Development Gap: HDI, GDI and related indices.

#### **Unit – 2: Poverty and Inequality**

Poverty: Concepts and Measurement, Income Inequality: Axioms, Index and Measures, Redistribution with Growth

#### **Unit – 3: Classical Development Theories**

Theories of Evolution of a Capitalist Economy: Classical, Marx and Schumpeter, Theories of Persistence of underdevelopment: The Vicious Circle Theory, The Stages of Growth: Rostow

#### **Unit – 4: Development Strategies**

Big Push: Rosenstein-Rodan, Balanced Growth: Nurkse, Unbalanced Growth: Hirschman, Critical Minimum Efforts: Leibenstein.

#### **Unit - 5: Dualistic Pattern of Development**

Unlimited Supply of Labour and the Dual Economy - Models of Arthur Lewis and Fei-Renis,  
Rural-Urban Migration: The Harris–Todaro Model, Core-Periphery Models - The Process of Cumulative Causation: Myrdal, Neo-Colonial Dependence Model

## **Unit – 6: Development Planning**

The Concept and Types of Planning, Rationale for Planning in a Developing Economy, The Planning Process: Projection of Macro Variables, Input-Output Models and Sectoral Projections, Project Evaluation and Social Cost-Benefit Analysis, Plan Failures, Market Versus Planning, Planning in a Market Oriented Economy, Plan Models in India

### **Course Outcomes**

- To get an insight into the real meaning of development, and how elements of economics and political economy influence the allocation of resources and can facilitate, or under certain situations, hamper the reduction of poverty, inequality and unemployment in a given society.
- To interpret the various development strategies and theories to assess the different development paths followed by different societies of the world. This can assist them in answering certain basic questions as to why some countries grow at a fast rate, while others lag behind; what are the conditions that can promote growth, and what are the conditions that can hinder growth, among others.
- To explain the measurement issues relating to development, the developments that have taken place over the years in terms of changes in the definition of development, and the related methodological issues. The students also gain knowledge on the issues relating to the definition and measurement of poverty and inequality – be it inequality in terms of income, or inequality involving gender.

### **Recommended Readings:**

1. Barro & Salai-Martin, “Economic Growth”, Prentice Hall of India.
2. Basu, K., “Analytical Development Economics:”, OUP.
3. Meier, G.M., “Leading Issues in Economic Development”, OUP.
4. Roy, D., “Development Economics”, OUP.
5. Thirlwall, A. P. “Growth and Development” Palgrave
6. Todaro, M.P., “Development Economics”, Pearson.
7. UNDP, “Human Development Reports”, OUP.
8. World Bank, “World Development Reports”, OUP

**ECO 1054**  
**Statistical Software for Data Analysis and Presentation**  
*(Value Added)*

This course will give an idea to students about the use of computer for presenting and summarizing data. Students can learn appropriate use of diagrammatical and tabular presentation of information. The use of computer and other statistical software in computing basic statistical tools and other relevant statistical technique will also be covered in this course. There will be hands-on training for each student with single computer.

**Unit 1: Presentation of data**

Diagrammatic Presentation- One dimensional –single, subdivided, multiple deviation; Two dimensional- histogram, pie diagram; Three dimensional- rectangular, cube; Pictograms and cartograms, scatter, line and radar diagrams; Tabular Presentation -Single; Double, Multiple

**Unit 2: Basic statistics**

Frequency, Summation, maximum, Minimum, Mean, Median, Mode, standard deviation, skewness

**Unit 3: Statistical relations**

Covariance; correlation- Bivariate, Partial, Rank, Correlation matrix; Simple Linear regression

**Course Outcomes**

- To describe the use of computer for presenting and summarizing data. Students can learn appropriate use of diagrammatical and tabular presentation of information.
- The use of computer and other statistical software in computing basic statistical tools and other relevant statistical technique is also covered in this course.
- There will be hands-on training for each student with individual computer.

## **ECO 2016**

### **Advanced Microeconomics**

#### **Unit 1: Inter-temporal Choice and Choice under Uncertainty**

Discounting and Present Value – Inter-temporal Consumption Decision – Inter-temporal Production Decision – Evaluation of Investment Projects – Determination of the Rate of Interest; Attitude towards Risk – Expected Utility – Measures of Risk Aversion – Certainty Equivalence and the Cost of Risk

#### **Unit 2: Economics of Insurance and Information**

Economics of Insurance – Asymmetric Information and Adverse Selection – Moral Hazard – Signaling and Screening - the Principal Agent Problem

#### **Unit 3: Determination of Factor Prices**

Pricing of Factors under Perfect Competition – Factor Share and Technical Progress – Backward Bending Supply Curve of Labour – Monopsony

#### **Unit 4: General Equilibrium**

Partial Versus General Equilibrium Approaches –Walrasian General Equilibrium System: Existence, Stability and Uniqueness of the Equilibrium - Tatonnement and Non-tatonnement Process–Arrow and Debreu re-specification of the Walrasian Economy – Idea of Fixed Point Theorems and their Application to Existence Proof – Uncertainty and the Contingent Markets – Ideas of Computable General Equilibrium

#### **Unit 5: Welfare Economics**

Pareto Optimality – The Fundamental Theorems of Welfare Economics – Market Failure: Externality and Public Good – Welfare Effects of Non-price Allocations and Price Control – Problem of Welfare Maximization: Compensation Principle, Social Welfare Function – Social Choice: Contributions of Arrow and Sen.

#### **Course Outcomes**

- To discuss how an individual could take decision under uncertain situation about current and future conditions which is a more realistic situation in our day to day life.
- Against the typical assumptions of complete knowledge about market, in this course discusses incomplete information about the market by the agents (which is of course more real).

- While going through this course student could quantify the risk involve in different real life situation and know how decision could be made that will maximize their satisfaction.
- How can the welfare of society be enhanced by considering the character of goods and social choice is also discussed in this course

### **Recommended Readings:**

1. Baumol, W.J., “Economic Theory and Operations Research”, Prentice Hall.
2. Hands, D.W., “Introductory Mathematical Economics”
3. Layard and Walters, “Microeconomic Theory”,
4. Madalla and Miller, “Microeconomics,” Tata McGraw Hill.
5. Sen, Amartya., “On Economic Inequality”
6. Snyder and Nicholson “Microeconomics”
7. Varian, Hall, “Intermediate Microeconomics.”

## **ECO 2026 Macroeconomic Theory and Policy**

### **Unit 1: Money, Inflation and Unemployment**

Inventory and Portfolio Balance Approaches to Demand for Money; Friedman’s Restatement of the Quantity Theory of Money; Inflation-Unemployment Trade-off: the Philips Curve Analysis; Monetarists’ Criticism of the Trade-off, Natural Rate of Unemployment and the Long Run Philip Curve; Adaptive versus Rational Expectations, New Classical School and the Policy Ineffectiveness Hypothesis

### **Unit 2: Supply of Money**

Supply of Money and its Components, Inside and Outside Money, Determinants of Money Supply, High-powered Money, Money Multiplier, Money Supply Determination in an Open Economy

### **Unit 3: Advances in Business Cycle Theory**

Theory of Real Business Cycles, Interpretation of the Labour Market, Importance of Technology Shocks, Neutrality of Money; New Keynesian Economics: Manu Cost Model, Recessions as Coordination Failure

#### **Unit 4: Growth Theory**

Determinants Growth, Harrod-Domar Model: Instability of Equilibrium, Solow's Neoclassical Model and Steady State Growth, the Alternative Theory: Kaldor's theory of Distribution and Growth

#### **Unit 5: Further Issues in Growth Theory**

The Convergence Debate, Role of Technical Progress, Learning by Doing, Role of Human Capital, Endogenous Growth Theories, Accounting for Sources of Economic Growth, Overlapping Generation Models

#### **Course Outcomes**

- To evaluate the nuance of different schools of thought and the implications thereof for macroeconomic policy formulation
- To extend the ideas of Monetary Economics to the working of the wider Financial Economy
- To enumerate the latest advances in theories of growth and business cycles

#### **Recommended Readings:**

1. A P Thirlwal, Growth and Development
2. Brian Snowdon and H R Vane, Modern Macroeconomics
3. David Romer, Advanced Macroeconomics
4. Debraj Ray, Development Economics
5. Levacic and Rebman: Macroeconomics: An Introduction to Keynesian Neo-Classical Controversies
6. N. Gregory Mankiw, Macroeconomics
7. Ola Olson, Essentials of Advanced Macroeconomic Theory
8. Soumen Sikdar, Principles of Macroeconomics

## **ECO 2036 Quantitative Tools**

#### **Unit – 1: Calculus for Dynamic Analysis**

First and second order differential equation and its solutions – application to dynamic stability of market and simple growth process (Harrod Domar), First order difference equation and its solution application of difference equation – lagged market model (Cobweb) and Harrod's model of growth; Optimal Control Theory- Basic Idea– Procedure – A few illustrative examples

**Unit – 2: Optimization with inequality constraint**

Liner programming, General formulation Transportation problem, diet problem and production problem – Simplex method of solution for well behaved and ill behaved functions (two variables, two constraints only) – Concept of duality, Formulation of dual equations.

**Unit – 3: Game Theory**

An overview of game theory, Nash equilibrium-economic application, Prisoner’s dilemma-economic application, Repeated games, Finitely repeated Prisoner’s Dilemma and Infinitely repeated Prisoner’s Dilemma.

**Unit – 4: Sampling and Estimation**

Concept of Sampling Distribution and Standard Error of a Statistic – Methods of Estimation – Principles of Moments, Least Square and Maximum Likelihood (Concepts only)

**Unit – 5: Statistical Inference**

Testing of Hypothesis: Type I and Type II Errors, One-tailed and Two-tailed Tests – Test based on Standard Normal, t and Chi-Square Distributions.

**Course Outcomes**

- To analyse the classical equilibrium analysis with maximization of profit and minimization of cost.
- To apply the techniques of game theory for solving various economic problems.
- To assess the techniques of sampling and hypothesis testing for using in research purposes.

**Recommended Readings:**

1. A.C. Chiang, “Fundamental Methods of Mathematical Economics”, McGraw Hill.
2. Gupta, S.C. and Kapoor, U.K., “Fundamentals of Mathematical Statistics”
3. Hooda, P.R., “Statistics for Business and Economics”, Macmillan.
4. Hoy. M. and others: Mathematical Economics
5. J. M. Henderson and R. E. Quandt, “Micro-economic Theory – A Mathematical Treatment.”
6. Mouhammed, “Introduction to Mathematical Economics”, Prentice Hall of India

7. Nagar, A.L. and Das, R.K., “Basic Statistics”, Oxford.
8. R.G.D. Allen, “Mathematical Analysis for Economists.”
9. S. Baruah, “Basic Mathematics and its Economics Applications”, MacMillan.
10. Salvatore, Dominick and Reagle, Darrick, “Statistics and Econometrics”, TMH
11. Yamane, Taro, “Statistics – An Introductory Analysis”.

## **ECO 2046**

### **Development Economics: Theory and Practice**

#### **Unit – 1: Financing of Development**

Domestic Sources: Private Savings, Taxation, Financing by Money Creation and its Effects, The Dual Gap Analysis: Saving-Investment Gap and the Foreign Exchange Gap, Foreign Borrowing and the Debt Serving Problem, Private Foreign Investment: Portfolio and Direct Investment, Effects on Host and Investing Countries – Direct Investment and Exploitation

#### **Unit – 2: Trade and Development**

Trade as an Engine of Growth, Trade and Aid, Gains from Trade, Terms of Trade and LDCs: Prebisch, Singer and Myrdal’s Views.

#### **Unit – 3: Environment and Development**

Environment and Economy Interdependence, Poverty and Environmental Degradation, The Concept of Sustainable Development, Micro Planning for Environmental and Eco- Preservation, Watersheds and Joint Forest Management, Role of State in Environmental Preservation

#### **Unit – 4: Economics of Education**

Education and Economic Development, Cost –Benefit Analysis of Education, Measurement of Costs, Measurement of Benefits, The Rate of Return of Investment in Education, Social Rate of Return to Investment in Education, Public and Private, Financing of Education: Criteria for Adequacy of Education Finance, Traditional as well as Modern Concept of Adequacy, Financing of Education and Equity

#### **Unit - 5: Health and Economic Development**

Health Care and Human Resource Development, Cost-Benefit Analysis of Health Care facilities, Cost-effectiveness Analysis of Health care Facilities

## **Unit – 6: Role of Institutions in Development**

Overview of growth models, Introducing institutions, Institutions as a determinant of growth, Institutional characteristics, Pitfalls of institutional reform

### **Course Outcomes**

- To identify the various sources of financing of economic development, the associated theoretical models suggesting the objective and the practical outcomes.
- To analyse the linkages between trade and development and environment and development
- To analyse the effects of education and health in the development outcomes of a society
- To illustrate the role of institutions in development

### **Recommended Readings:**

1. Acemoglu, D and J Robinson, “The Role of Institutions in Growth and Development”, Working Paper No.10, Commission on Growth and Development, World Bank.
2. Aghion, P and Steven N Durlauf (ed), “Handbook of Economic Growth”, Volume 1A, Elsevier
3. Basu, K., “The Less Developed Economy:”, OUP.
4. G. Psacharopoulos (ed), “Economics of Education”, Pergamon Press.
5. Ian Beardwell and Len Holden (ed), “Human Resource Management – Contemporary Perspective”, MacMillan.
6. Meier, G.M., “Leading Issues in Economic Development”, OUP.
7. Thirlwall, A. P. “Growth and Development”, Palgrave
8. Todaro, M.P., “Development Economics”, Pearson.
9. World Bank, “World Development Reports”, OUP.

## **ECO 2054** **Quantitative Aptitude and Test of Reasoning** *(Value Added)*

### **Unit 1: Mathematical Reasoning**

Number series – Time and Calendar – Clock related – Number related

**Unit 2: Numerical Ability**

Arithmetic – Profit and Loss – Ratio and Proportion – Simple and Compound Interest - Discount

**Unit 3: Data Interpretation**

Tabulation – Bar graphs – Pie charts – Line graphs

**Unit 4: Logical Reasoning**

Alphabet series – Analogies – Classification - Coding and Decoding – Arranging in Order – Letter Digit term

**Course Outcomes**

- To practise skills for competitive examinations

**Recommended Readings:**

1. Aggarwal, R.S, “Quantitative Aptitude for Competitive Exams”, S.Chand
2. Aggarwal, R.S, “A Modern Approach to Logical Reasoning”, S.Chand
3. Trueman’s Specific Series “UGC NET/SET”

**ECO-3016  
Elements of Econometrics****Unit 1: Classical Linear Regression**

The General Linear Regression Model – Quantitative and Qualitative Explanatory Factors –Least Square Assumptions – OLS Estimators and their Properties – The Coefficient of Determination – Some Results of Two and Three Variable Regression Models - Test of Hypothesis about Regression Coefficients – Prediction with the Linear Regression Equation

## **Unit 2: Further Topics in Linear Regression**

Consequences of Omission of Relevant Regressors and Inclusion of Irrelevant Regressors; Multicollinearity: Effects, Detection and Remedies, Dummy Variable Trap; Heteroscedasticity: Consequences, Tests and Remedy, Auto-correlated Disturbances: Consequences, Detection and Remedy

## **Unit 4: Introduction to Time Series Econometrics**

The Idea of a Stochastic Time Series - Stationary and Non-stationary –Simple Random Walk and Random Walk with a Drift–Unit Root: Dickey Fuller Tests –Spurious Regression–Integrated Series and Simple Cointegration

## **Unit 5: Introduction to Simultaneous Equation Model**

Structural and Reduced Forms – Simultaneity Bias – Informal Introduction to Identification Problem, Indirect Least Squares and Two Stage least Squares

## **Course Outcomes**

- Provide Econometric literacy to enable students to read technical literature in Economics
- Elaborate the techniques for undertaking empirical research
- Analyse and interpret the stochastic situation commonly encountered in real life economic situations

## **Recommended Readings:**

1. Christopher Daugherty, Introduction to Econometrics, OUP
2. DamodarGujarathi, Basic Econometrics, McGraw Hill.
3. Jeffery M Wooldridge, Introductory Econometrics: a Modern Approach
4. Johnston and Dinardo, Econometric Methods, McGraw Hill

## **ECO 3026**

### **Public Finance**

#### **Unit-1 Role of the State in the Economy**

The role of the government in the economy -allocation, distribution, and stabilization functions. Criteria for policy evaluation – equity, economic efficiency, paternalism and individual freedom and their tradeoff. The welfare cost of inefficient output.

#### **Unit-2: The Provision of Public Goods**

The nature of Public goods. Public Goods and market failure. The efficient provision of public goods. The Theory of Clubs, Inter-local competition and Tiebout Hypothesis. Inefficiency from externalities and its correction. Internalizing externalities: The Coase Theorem. Viability of government intervention.

#### **Unit-3: The Theory of Public Choice**

Preferred political outcome of a voter and Downs' Rational Voter Hypothesis. Majority Rule and the Median Voter Model. Cyclical Majority Phenomenon and Arrows Impossibility Theorem. Political Positioning and the Median Voter. Voting on multiple issues: Logrolling.

#### **Unit-4: Public Expenditure**

Public Expenditures on non-marketed goods, fixed-quantity subsidy for marketed goods and excise subsidy-their impact on allocation and distribution. Program Budgeting and Cost-effectiveness Analysis. Public Project Appraisal: Cost-Benefit Analysis. Public expenditure on Health Care, Education and Retirement Security: Rationale and Emerging Issues.

#### **Unit-5: Public Revenue**

Concepts of Tax Ratio, Buoyancy, and Elasticity of taxation, Tax Credit, Exemption and Deduction, and Taxable Capacity. Excess burden- Lumpsum Tax versus Price Distorting Tax, Efficiency Loss Ratio of a tax. Partial versus General Equilibrium Analysis: Incidence of Excise Taxes and General Sales Tax. The welfare cost of taxation. Goods and Services Tax (GST) and the Indian experience.

#### **Unit-6 The Public Budget and Deficit Financing**

Structure of a public budget. Concepts of Budget Deficits Burden of Deficit Finance- Ricardian Equivalence Theorem. Deficit financing and the Capital market: *The Crowding Out Effect*. The Welfare Cost of Deficit Finance. Rationale and methods of reducing deficits.

## **Unit-7. Fiscal Federalism**

Principles of division of financial resources. Instruments of inter-government resource transfer. Horizontal and Vertical fiscal balance. Problems of Centre-State Financial Relations in India.

### **Course Outcomes**

- To discuss the role of the state in Public Finance in terms of the various functions.
- To interpret the phenomenon of total and partial market failure and prescribe potential corrections.
- To execute various forms of voting rules as a means of more effective public intervention.
- To analyze effects of subsidy under various preconditions.
- To illustrate the Cost-Benefit Technique which can be applied to various social security issues.
- Public Budgeting is analysed in details and the implications of the various deficits can be interpreted.
- Principles of fiscal federalism and a perspective of the relevant issues are examined

### **Recommended Readings:**

1. Browning E K & Browning J M, Public Finance and the Price System, Pearson
2. Cullis, John & Jones, Philip, Public Finance and Public Choice, McGraw Hill.
3. Education. Singapore.
4. Ghosh A & Ghosh C, Public Finance, PHI Learning Private Limited, Delhi.
5. Hyman D N, Public Finance: A Contemporary application of Theory to Policy,
6. Mukherjee S, Ghose A & Nag N N, Analytical Public Finance. Public Economics-Public Choice-Public Policies, New Central Book Agency (P), Kolkata.
7. Musgrave & Musgrave., Public Finance in Theory and Practice, McGraw Hill,
8. Singapore.
9. Thomson South Western.
10. Ulbrich H, Public Finance in Theory and Practice, Thompson South Western.

## **ECO 3036**

### **International Economics**

#### **Unit 1: International Trade Theories**

Factor Endowments and Trade: Heckscher-Ohlin Theory, Factor –Price Equalization Theorem and Income distribution- Stolper-Samuelson Theorem, The Specific-Factors Model.

#### **Unit 2: Economic Growth and Changes in Trade**

Shifts in Demand: Engel Effects and Engel's Law; Factor Growth-Rybczynski Theorem; Technical progress and Trade; Technological Change and Trade: Technology as Factors of Production; New Products and the Product Cycle.

#### **Unit 3: Economies of Scale, Imperfect Competition, and International Trade**

Monopolistic Competition and Trade-Economies of Scale and Comparative Advantage, Significance of Intra-industry Trade, Economies of Reciprocal Dumping

#### **Unit 4: International Trade Policy**

Tariff Analysis in General Equilibrium; Theory of Customs Unions; Export Barriers; Export Subsidies and Countervailing Duties, Dumping. Retaliation against Dumping; International Cartels.

#### **Unit 5: International Monetary Order**

International Monetary System --Gold Standard, Inter War Period, Bretton Woods System; Managed Flexibility, Floating Exchange Rate, Monetary Union, Optimum Currency Area,

#### **Unit - 6: International Debt Crisis**

Dimensions of Debt Crisis, International capital Movement, Capital Transfer Process, Recycling of Petro-Dollars, Causes of Debt Crisis, Secondary Market for Debt of Developing Countries, Alternative Policy Options.

## Course Outcomes

- To analyse the International trade theories, changing pattern of international trade in view of developments in trade environments
- Elaborate how different international trade policies undertaken by the trading nations
- To illustrate the historical facts and present status of international trade relations among countries

## Recommended Readings:

1. Caves, R. E., J. A. Frankel and R. W. Jones, “World Trade and Payments”, Pearson.
2. Chacholiades, M., “International Trade: Theory and Policy”, McGraw Hill.
3. Kindleberger, Ridge, “International Economics”, Irwin.
4. Krugman, P. R. and M. Obstfeld, “International Economics”, Pearson.
5. Lipsey, R. G., “The Theory of Customs Union”, Windfield.
6. Meade, J. F., “Theory of International Economic Policy”, OUP.
7. Roy, P. N., “International Trade: Theory and Policy”.
8. Soderston, B., “International Economics”, Tata McGraw Hill.

## **ECO 3046** **Financial System** *(Elective)*

### **Unit-1: The Financial System**

The nature of credit, Financial system and its Components: *Instruments, Markets, Institutions and Services*, The Functional Perspective of the Financial System, Financial System in Economic Growth and Global Integration.

### **Unit-2: Intertemporal Value of Money**

Time Value of Money, Future Value: Single Cash Flow, Multiple Cash Flows, Annuity, Present Value: Single Cash Flow, Multiple Cash Flows, Annuity, Present Value, Net Present Value, Rate of Return, Internal Rate of Return

### **Unit-3: The Money Market**

Structure and functions, Instruments in the money market, Call Money Market and its participants, Volatility in Call Rates, Money Market Intermediaries: *The Discount and Finance House of India and Money Market Mutual Funds*, Liquidity Management Instruments in the Money Market

### **Unit-4: The Capital Market**

The Capital market: Its nature and functions, Primary Capital Market: Instruments of resource mobilization- *Public Issues: IPO & FPO, Right Issues, and Private Placement*, Resource mobilization from International Capital Market, Pricing of new issues: the Book Building process, Reverse Book Building and Green Shoe Option, Secondary Capital Market: Organization, Management and Membership, Trading & Settlement, *The Over the Counter Exchange of India*, The Depository System and its operation, Stock Market Index- Method of calculating the index, Mutual Fund and its functional classification, Net Asset Value

### **Unit 5: The Derivative Market**

Nature of the Derivative Market, Traders and Instruments in a derivative market, Trading Strategies: Hedging with Index futures, Speculation Strategies and Strategies for Arbitrage

### **Unit-6: Valuation of Financial Assets**

Concept of Value, The valuation of debt instruments: bonds with maturity-Yield to Maturity, Current yield, Yield to Call, Deep Discount Bonds, Perpetual Bonds, Interest Rates and Bond Values, Valuing stock: Value of a Preference Share, Ordinary Shares: Single Period and Multi-Period Valuation, Linkage between Share Price, Earnings and Dividends, The significance of Price-Earnings Ratio (P/E)

### **Unit-7: Banking Sector Operations and Management**

Overview of bank operations: Banks as financial intermediaries, Sources of Funds of banks, Uses of Funds by banks, Off-balance sheet activities of banks, Regulation of banks: Capital Regulation, Operations Regulation, Bank Monitoring Measures undertaken by Regulators, Issues relating to government bailout, Reforms in Banking Sector in India.

## Course Outcomes

- Students analyse the financial system including its various components like markets, assets and institutions.
- To estimate parameters like cash flow, annuity, net present value, rates of return etc.
- Students are able to analyze the operation of the various instruments of the money market.
- Exposure to the capital market enables the students to explain the modalities of resource mobilization through various capital market assets.
- To illustrate the trading in the stocks market and analyze the complexities of the derivative market.
- To undertake valuation of both debt and equity instruments. They acquire the ability to analyze profitability of such instruments as investment destination

## Recommended Readings:

1. Alexander G J, Sharpe W F & Bailey J V. *Fundamentals of Investments* Pearson Education, Singapore.
2. Bhole L. M. *Financial Institutions and Markets: Structure, Growth & Innovation*, Tata McGraw Hill, New Delhi
3. Bodie Z, Merton R. C. & Cleeton D. L. *Financial Economics*. Pearson/ Prentice Hall.
4. Gupta, S. B. *Monetary Economics: Institutions, Theory and Policy*, S Chand & Co, New Delhi.
5. Madura J. *Financial Institutions and Markets*, Thomson South Western.
6. Panday I.M. *Financial Management* . Vikas.
7. Pathak B. V. *Indian Financial System*, Pearson Education, Singapore.

## **ECO 3056** **Industrial Economics** *(Elective)*

### Unit 1: Introduction to Industrial Economics

Meaning, scope, need and significance of the study on Industrial Economics

**Unit 2: Alternative Theories of the Firm**

Profit Maximization – Sales Maximization – Managerial Theory – Behavioural Theory – Transaction Costs Theory.

**Unit 3: Industrial Organization**

Market Structure, Market Conduct and Market Performance – Meaning and their interrelation under different markets –Market Concentration and Monopoly Power – Definition and Measurement.

**Unit 4: Diversification, Vertical Integration and Merger**

Diversification, Vertical Integration and Merger – Meaning - Types - Motives - Measures of diversification, vertical integration and merger.

**Unit 5: Pricing and Investment Decision**

Theoretical considerations- Cost –plus pricing -Variable cost pricing - Target rate of return pricing –Pricing in Public Enterprises – Nature and Type of Investment Decisions – Methods of Project Evaluation – Risk and Uncertainty in Project Appraisal.

**Unit 6: Industrial Finance**

Financial Statements - Ratio Analysis and Interpretation – Industrial Finance: Types of Finance – Money and Capital Markets Commercial and Development Bank – Objectives and functioning – Impact of these Institutions on the Supply of Long and Medium Term Finance for the Industrial Sector and on the Financial Structure of the Corporate Sector, Its Implications.

**Unit 7: Industrial Location Analysis**

Determinants of Industrial Location – Economic theories of Industrial Location –Industrial locational trends in India.

**Unit 8: India's Industrial Economy**

Structure of India's industrial sector – MSME sector – India's corporate sector –Policy framework for India's industrial sector since independence.

**Course Outcomes**

- To examine the alternative theories of the firm as opposed to the traditional theories of the firm
- To analyse the structure, conduct and performance of the firm under different market conditions.
- To categorise the different motives and measures of firm Diversification, Integration and Merger
- To interpret the Pricing process and Investment Decision of firm, the sources of industrial finance, and the factors determining industrial location.

- To examine the industrial economy of India

### **Recommended Readings:**

1. Barthwal, R. “Industrial Economics”, Wiley Eastern.
2. Bain, J., “Industrial Organization”, John Wiley.
3. Panagariya, A., “India – The Emerging Giant”
4. Koutsoyiannis, A., “Modern Microeconomics”, Macmillan.
5. Sen, A., “Industrial Organisation”, Oxford.

## **ECO 3066** **Environmental Economics** *(Elective/Open)*

*The primary objective of this paper is to introduce the students to environmental issues with an interdisciplinary focus. The paper will be especially appropriate for students with major in Economics, Political Science, Environmental Science and Biological Sciences*

### **Unit –1: Environmental Economics as a sub discipline in Economics**

Environmental Economics –Scope and Nature- Environmental Economics , Ecological Economics and Resource Economics.

Basic Concepts : Natural Resources-Renewable and Non-Renewable, Market Failure, Externality, Property Rights , Transaction costs, Pigouvian Tax – Environment as Public Goods- Open Access – The Tragedy of Commons.

Global Environmental Issues- Climate Change, Loss of Biodiversity, Ozone Depletion, Pollution Havens-

### **Unit –2: Environment and the Economy- the neoclassical perspective**

Environment and the Economy : the neoclassical perspective- Role of natural environment on the economy-market as a provider of information on resource scarcity-price as an indicator of absolute, relative and emerging resource scarcity; Factor substitution possibilities , technical change-implications on resource scarcity and resource conservation. Economy and the environment-Neoclassical worldview.

### **Unit –3: Environment and the Economy-An ecological perspective**

Environment and the Economy : An ecological perspective – Ecosystem structure, Ecosystem function-materials recycling-energy and thermodynamics, Ecological Succession, Ecology and its implications for the economy.

### **Unit – 4: Economics of Natural Resources**

Economic Issues relating to use of Non-renewable Resources, Optimal Depletion – Issues relating to Renewable resources, Sustainable exploitation, Common Property Resources – Case studies (e.g Sacred groves)

### **Unit –5: Valuation of Environmental Goods and Services**

Demand for environmental goods –ordinary goods vs. environmental goods- Willingness to pay and willingness to accept- Use and Nonuse Values; measuring demand-revealed preference and stated preference. Methods for measuring benefits of environmental improvement –the market pricing approach, the replacement cost approach. Hedonic Pricing approach-valuation of health risks; Household Production Function Approach-Aversive expenditure, Travel Cost method; Contingent Valuation Method

### **Unit –6: Pollution Control**

Pollution Prevention, Control and Abatement – Command and Control and Market Based Instruments –Taxes Vs Tradable Permits ; International Conventions and Protocols ; Environmental Policy in India-Environmental Impact Assessment.

### **Unit –7: Environment and Development**

Environment Development Trade off : Population, development and environmental degradation in the developing world -Poverty and Environment – Affluence and its contribution to environmental degradation Sustainable Development-Hartwick-Solow Approach, ecological economics approach-safe minimum standard approach; Sustainable National Income Accounting .

### **Course Outcomes**

- The primary objective of this paper is to introduce the students to environmental issues with an interdisciplinary focus.
- The paper will be especially appropriate for students with major in Economics, Political Science, Environmental Science and Biological Sciences
- To analyse the working of the Environment and the Economy from the neoclassical and ecological perspective.

- To interpret the issues related to the use of natural resources
- To explain the various techniques of valuation of environmental goods and services.
- To explore the relationship between environment and development.
- To discuss various pollution control measures.

#### **Recommended Readings:**

1. Bhattacharjya, R., *Environmental Economics*’, Oxford University Press.
2. Hanley, Shogren and White, *Environmental Economics*, Macmillan.
3. Hussen, Ahmed, (2004)*Principles of Environmental Economics*,Routledge
4. Kolstad, Charles D., *Environmental Economics*, Oxford University Press.
5. Kolstad, Charles D.,(2011) *Intermediate Environmental Economics*, Oxford University Press.
6. Shanker, U, *Environmental Economics*, Oxford University Press.

## **ECO 3074**

### **Project Formulation and Execution**

*[Value Added]*

#### **Unit 1: Preparing Research Proposal for Ph.D/ M.Phil Programmes**

Meaning and Purpose, Structure of the format, Report Outline, Body of the report-Introduction, Review of literature, Methodology, description of study area. Presentation Techniques: *Results and Discussion, Findings, Conclusion and Recommendation, References/ Bibliography*

#### **Unit 2: Preparing Research Proposal for Academic Sponsorship**

Meaning and Purpose, Structure of the format, Report Outline, Body of the report- Introduction, Statement of research problem, Review of literature and recent development, Inter-disciplinary/ Interdepartmental/Inter Institutional Relevance, Methodology, description of study area, Presentation Techniques: *Results and Discussion, Policy Implication, References, Budget, Duration.*

#### **Unit 3: Preparing Research Proposal for Consultancy Services**

Meaning and Purpose, Structure of the format, Report Outline, Body of the report- Introduction, Review of literature, Methodology, description of study area.

Dimensions of Study: Project Appraisal (*Cost-Benefit Analysis, Cost-Efficiency Analysis, Environmental Impact Assessment*).  
Presentation Techniques: *Results and discussion, References*

**Unit 4: Execution of different types of reports**

Technical Report, Popular Report, Interim Report, Executive / Summary Report, Research Abstract

**Unit 5: Preparation of budget**

Meaning and Purpose, Content of budget, Guidelines of a budget

**Unit 6: Preparation of Work Plan**

Meaning and Purpose, content of a work plan

**Recommended Readings:**

1. Baker, R.P and Howell, A.C (2003): The Preparation of Reports, Ronald Press, New York
2. Kothari, C.R (2004): Research Methodology: Methods and Techniques, New Age International Publishers, Delhi
3. Krishnaswami, O.R. (2003): Methodology of Research in Social Sciences, Himalaya Publishing House, Delhi

**ECO 4016**  
**Indian Economy in the Global Context**  
*(CORE)*

**Unit – 1: Global Economy: Concept and Evolution**

Global Economy- Nature of Global Economy; Emergence and evolution of the Global Economy-Pre-Industrial Revolution to the Present Times.

**Unit – 2: Global Economy: Key Issues**

International Trade, Transnational Production,, Global Financial System, Global Division of Labour, Gender, Economic Development, Global Environmental change, Ideas, Security, Governance.

### **Unit – 3: Economic History of India in the Global Context-An Overview**

Transition to colonialism-Colonial Times-Post Colonial –Post Independence-Post reforms.

### **Unit – 4: India’s Economic Reforms**

Rationale for Economic Reforms – India’s Economic Reforms in the Global Context – Foreign Trade Policy – Convertibility of Rupee – Impact of WTO on Indian Economy – Foreign Investment and Multinational Corporations.-Privatisation and Competition – Financial Sector Reforms

### **Unit – 5: India: the Emerging Giant**

Macroeconomic Indicators-GDP-Real Economy-Prices-Saving-Investment-Government Finance, Money and Finance, External Sector, Infrastructural Indicators; Human Development Indicators; Institutional Development in the Financial Sector; Competitiveness Indicators-India and the Global Financial Crisis

### **Course Outcomes**

- To analyse the concept and evolution of the Global Economy, and the key issues involved in the process.
- To provide an insight into the economic history of India and place it in the global perspective.
- To examine and analyse the process and outcome of India’s Economic Reforms
- The course is also intended to help students in their preparation for competitive exams

### **Recommended Readings:**

1. Bardhan, P., “The Political Economy of Development of India”, OUP.
2. Brahmananda, P.R. and Panchamukhi, V.R., “The Development Process of Indian Economy”, Himalaya.
3. Jalan, Bimal (Ed), “The Indian Economy – Problems and Prospects”, Viking.
4. Kapila, Uma (Ed), “India’s Economic Reforms”, Academic Foundation.
5. Hazari, R.K., “Industrial Planning and Licensing Policy”, Final Report.
6. Sen, A. and Dreeze, J., “Economic Development and Social Opportunities”, OUP.
7. Wadhwa, C. (Ed), “Some Problems of India’s Economic Policy”, Tata McGraw Hill.
8. Rao, V.K.R.V., “India’s National Income, 1950-1980”, Sage.

9. Byres, T.J. (Ed), “The State, Development Planning and Liberalisation in India”.
10. O’Brien, Robert and [Marc Williams](#) Global Political Economy: Evolution and Dynamics, Palgrave Macmillan
11. Roy Tirthankar, The Economic History of India, 1857-1947 Oxford

**ECO 4026**  
**Demography**  
*[Elective]*

**Unit-1: Theories of population**

The Malthusian Theory of population. Theory of Optimum Population, Theory of Demographic Transition, Theory of Becker and Easterlin, Henry Leibenstein’s Theory of Fertility. Concept of Stable Population and Stationary Population. The Stable Population model, its vital rates and other characteristics.

**Unit-2 : Vital Rates and the Life Table**

Measures of Reproductively - Total Fertility Rate, Gross Reproduction Rate, and Net Reproduction Rate, Standardised Fertility and Mortality Rates, Different Approaches to Measuring Infant Mortality Rate. Concept of a Life Table. Relationship among the different life table functions.

**Unit-3 : Nuptiality**

Basic measures of nuptiality, Estimation of the singulate mean age at marriage

**Unit-4 : Population Projection**

Component method of projection of population at the national level. Projection of the economically active population

**Unit-5 : Migration**

Internal migration – concepts, determinants and consequences. Measures of internal migration . International migration – types, determinants and consequences. Migration models - Ravenstein’s laws of migration, Everett Lee’s theory of migration, Todaro’s model of rural-urban migration, L-F-R model of migration

### **Unit-6 : Economically Active Population**

Basic concepts and definitions. Female participation in the workforce.

### **Unit-7: Population Policy**

Population policies affecting fertility in developed and less developed countries. Population policies and programmes in India.

### **Course Outcomes**

- To describe the size, composition and distribution of human populations over time and across space, and the processes through which populations change, namely the processes of birth, death and migration.
- To compare and critique the different theories of population, gain awareness on the roles played by factors such as age, sex, education, occupation, income, and others in influencing the size and distribution of populations, thus enhancing their understanding on population dynamics.
- To provide the students with relevant tools to study contemporary and burning issues faced by every country of the world like migration, whether it is domestic or internal and international, migration from rural areas to urban areas, and the types, determinants and consequences of migration.
- To examine the various population policies affecting fertility in the developed and less developed countries, and which contribute in helping the government and society to deal with the issues relating to population growth, aging and migration in a holistic manner.

### **Recommended Readings:**

1. Agarwala, S.N., “India’s Population Problems”.
2. Barclay, “Techniques of Population Analysis”. UNO, “the Determinants and Consequences of Population Trends
3. Bhende, A. and T. Kantikar, “Principles of Population Studies”.
4. Bogue, D.J., “Principles of Demography”.
5. Gupta, S.P. and V.K. Kapoor, “Fundamentals of Applied Statistics”.

6. Ramkumar, R., “Technical Demography”.
7. Shryock, H. and J.S. Seigal, “The Methods and Materials of Demography”.
8. Thompson and Lewis, “Population Problems”.

**ECO 4036**  
**Operations Research**  
*[Elective]*

**Unit 1:**

Definition, features of Operations Research, scientific method in Operations Research, opportunities and shortcomings.

**Unit 2:**

An overview of linear programming, formulation of some special problems, solution methods for the ill-behaved problems, solutions via dual, sensitivity analysis in linear programming and its various techniques, integer programming with special reference to the zero-one programming.

**Unit 3:**

Non-linear Programming, formulation of problems, graphical solution method, Kuhn-Tucker conditions and solution by Kuhn-Tucker conditions.

**Unit 4:**

Transportation Problem, an overview of the transportation problem, balanced and unbalanced transportation problem, method of finding out initial solution by North-West Corner Method, Least Cost Method, and Vogel’s Approximation Method, loop in transportation table, dual of transportation model, method of finding out optimal solution.

**Unit 5:**

Queuing Theory, introduction, essential features of a queuing system, estimation of inter-arrival time distribution, Transient- State and Steady- State- distribution of Service Time, Pure Birth Process and Pure Death Process.

**Unit 6:**

Project Management, introduction, CPM and PERT technique, basic difference between the two, significance of using PERT/CPM, Phases of Project Management, PERT/ CPM Network Components and Precedence Relationships, Activity-on-Node(AON) and Activity-on-

Arrow(AOA) network, errors and dummies in Network, Critical Path Analysis, Forward Pass Method and Backward Pass Method, Float of an activity and event.

### **Course Outcomes**

- To explain the various linear and non-linear programming techniques.
- Describe the queuing theory and use it for solving various problems.
- To use techniques of project management for developing network diagrams.

### **Recommended Readings:**

1. A.M. Natarajan P. Balasubramani A. Tamilarasi, *Operations Research*, Pearson.
2. H A Taha, *Operations Research*, Pearson
3. J K Sharma, *Operations Research Theory and Applications*, Macmilan
4. Martin J. Osborne, *An Introduction to Game Theory*, Oxford University Press.

## **ECO-4046** **Econometric Methods** *(Elective)*

### **Unit 1: Generalised Least Squares and Maximum Likelihood Estimation**

Non-spherical Disturbance and GLS – Feasible GLS and its Properties Seemingly Unrelated Regression Estimation; Maximum Likelihood Methods, Estimation and Properties – Likelihood Ratio, Wald and Scope Tests

### **Unit – 2: Non-Linear Estimation**

Non-Linear Least Squares and Iteration process – Models with Binary Dependents Variables – Logit and Probit Models

### **Unit – 3: Distributed Lag Models**

Lag Structure and Parameters – Koyck Model – Partial Adjustment and Adaptive Expectation Models – Estimation of Models with a Lagged Dependent Variable

#### **Unit – 4: Simultaneous Equation Models**

Formalization of Identification Problem - Order and Rank Conditions of Identification –Recursive Models – Methods of Estimation: IV, 2SLS, 3SLS and FIML–Simulation and Forecasting

#### **Unit 5: Time Series Modeling**

Univariate Time Series Modeling,-Autocorrelation Function and Correlelogram – Basic Features of AR, MA, ARMA and ARIMA models – Trend versus Difference Stationary - Co-integration, Error Correction Mechanism and ARDL Granger Causality and VAR

#### **Unit 6:Introduction to Panel Data**

Nature and Advantages of Panel Data – Modeling Issues: Fixed Effect versus Random Effects – Housman Test – Estimation methods

#### **Course Outcomes**

- Explain the tools of intensive empirical analysis
- Equip students with the skill for assisting, conducting and guiding empirical research
- Describe the tools for analyzing financial markets

#### **Recommended Readings:**

1. Christopher Daugherty, Introduction to Econometrics, OUP
2. DamodarGujarathi, Basic Econometrics, McGraw Hill.
3. Greene, William, Econometric Analysis, Macmillan
4. Jeffery M Wooldridge, Introductory Econometrics: a Modern Approach
5. Johnston and Dinardo, Econometric Methods, McGraw Hill
6. Pindyck and Rubinfeld, Econometric Models and Econometric Forecasts, McGraw Hill.

**ECO 4056**  
**Model Building and Simulation in Economics**  
*[Elective]*

**Unit 1: Introduction to Model Building**

Basic principles of model building in economics - issues relating to specification, identification and estimation of models

**Unit 2: Taxonomy of Models**

Introduction to various types of models: mathematical models, econometric models and time-series models; models with micro-orientation, optimizing models and macro-econometrics; systematic outline of AGE models – demonstration using the Shoven-Walley model, macro-econometrics models – estimation demonstration using Klein's Model I, structure of Klein-Goldberger model, static and dynamic models, sectoral models; simulation models, simultaneous and recursive models.

**Unit 3: Estimation and Evaluation of Models**

Various methods of estimating macro, policy-oriented and programming models; testing the validity of models - principles and criteria.

**Unit 4: Empirical and Policy Models built for India**

Discussion of specific models – IEG-DSE, NCAER, RBI and other macro-econometric models

**Unit 5: Simulations of Models: Static and Dynamic**

Basic concepts in simulations, development and implementation of simulation modelling, design of simulation models, simulation of sectoral and macro models; examples of simulation modelling - queuing systems, simulation of inventory systems etc., optimization of simulation parameters, base results and subsequent scenarios, verification and validation of simulation results, ex-ante and ex-post simulations.

**Course Outcomes**

- To describe the basics of Model Building in Economics
- To differentiate between various models
- To analyse the various methods of estimation and evaluation of models

## **Recommended Readings:**

1. Fair, R.C., Specification, Estimation and Analysis of Macro-econometric Models, Harvard University Press, Cambridge, 1984.
2. Granger, C.W.J. and Timo, T., Modelling Non-linear Economic Relationships, 1996, Oxford University Press.
3. Granger, C.W.J., (ed.), Modelling Economic Series: Readings in Econometric Methodology, Clarendon Press, Oxford, 1990.
4. Hoover, S.V. and Ronald, F.P., Simulation: A Problem-Solving Approach, 1989, Massachusetts, Addison Wesley.
5. Kendall, M.G., 'Introduction to Model Building and its Problems' in Mathematical Model Building in Economics and Industry, 1968, London, Charles Griffin and Co., Ltd.
6. Rubinstein, R., Simulation and the Monte Carlo Method. 1981, New York.
7. Tabor, M., Chaos and Integrability in Non-linear Dynamics: An Introduction, 1989, New York, John Wiley.
8. Woods, R.L. and Kent, L.L., Modelling and Simulation of Dynamic Systems, 1997, Prentice Hall, New Jersey.

## **ECO 4066**

### **Agricultural Economics and Farm Management**

*[Elective]*

#### **Unit – 1: Introduction to Agricultural Economics**

Nature and Scope of Agricultural Economics – Agricultural Economics and Resource Economics, Agricultural Economics and Environmental Economics; Primary Sector vs. Secondary Sector - Role of Agriculture in Economic Development -Interdependence between Agriculture and the Rest of the Economy.

#### **Unit – 2: Farming Systems**

Farming Systems-Subsistence farming, Peasant Farming-Chhayanovian Farm Household Model, Shifting Cultivation, Cooperative Farming, Commercial Farming.

#### **Unit – 3: Farm Management**

General management and Farm Management, Position and the role of a Farm Manager, Farming objectives, Farm Management Tasks-Planning, Organisation, Implementation, Control, the Decision Making Process in Farm Management-Steps in Decision Making, Farm Size and Productivity, Uncertainty and Risk, Rotation of Crops , Location of Crops. Farm Budgeting-Types.

#### **Unit – 4: The Economics of Agricultural Production**

Production Functions – Factor-Factor Relationships , Product-Product Relationships ; Discreet Production Functions – Continuous Production Functions -. Inverse Production Functions-Duality of Cost and Production

**Unit-5: Agricultural Production Functions:** Forms of Production Functions, Original Cobb Douglas Function-Early Generalizations, Cobb Douglas Type of Function - Profit Maximization with the Cobb Douglas Function-Duality and the Cobb Douglas Function; Spillman Production Function, Transcendental Production Function, Cobb Douglas Function with Variable Elasticities, Generalized Power Production Function.

#### **Unit – 6: Agricultural Factor Markets**

Land Market: Land Use and Land Prices, Lease Market – Land Tenure System ; Labour Market: Mobility of Labour – Segregation of Labour; Credit Market: Role of Capital in Agricultural Development ; Interlinked markets.

#### **Unit – 7: Demand and Supply of Agricultural Products**

Demand for Farm Products: Factors affecting Demand for Food, Engel law and Engel Elasticities – Supply of Agricultural Products – Supply of Individual Crops and Aggregate Supply – Marketed Surplus and Marketable Surplus – Cobweb Market Model, Nerlove’s PAAE Model – Supply Response of Perennials Crops.

#### **Unit – 8: Behavior of Agricultural Prices**

Features of Agricultural Prices – Intra and Inter Seasonal and Inter-Year Price Behaviour — Agricultural Price Indices – Agricultural Price Policy: Its Role and Functions – Sectoral Terms of Trade and Economic Growth.

#### **Course Outcomes**

- To describe the various issues of farming systems and farm management
- To analyse the Economics of Agricultural Production
- To describe the mathematical tools for analyzing Agricultural Production Functions
- To enable students to analyse the Economics of Agricultural Production

#### **Recommended Readings:**

1. Cohen, R., “The Economics of Agriculture”, Cambridge University Press.
2. Debertin, David L. “Agricultural Production Economics “ Pearson Education

3. Fei, Ranis, “ Economic Growth: An Evolutionary Perspective”.
4. Heady, E.O. and Dhillon, J., “Agricultural Production Functions”, Kalyani.
5. Heady, E.O. “Economics of Agricultural Production and Resource Use”, Prentice Hall.
6. Kay, Ronald D. ,William M. Edwards, and Patricia A. Duffy. “ Farm Management” McGraw
7. Ray, Debraj, “Development Economics”, OUP.
8. Reenen, M.J. Van J.A.H. Davel Farm Management -A Business approach University of South Africa Pretoria
9. Schultz, T.W., "The Economic Organisation of Agriculture”, McGraw Hill.
10. Snodgrass M.M. and L.T.Wallace “Agriculture Economics and Resource Management”PrenticeHall of India Pvt. Ltd. New Delhi.
11. Soni, R.N., “Leading Issues in Agricultural Economics”.

**Paper- 4076**  
**Financial Operations & Management\***  
*[Elective]*

**Unit-1: The Investment Setting**

Securities, Risk & Return, Markets, and Financial Intermediaries.

Process of Investing: *investment policy, security analysis, portfolio construction, portfolio revision and portfolio evaluation*. Financial Goals: *Profit Maximization versus Wealth Maximization*. Trading in Securities: *types of orders, margin purchases, and short sales*.

**Unit-2: Principles of Market Valuation**

The law of One Price and Arbitrage. The valuation of debt instruments: Pure Discount Bonds. Coupon Bonds, Current Yield and Yield to Maturity. Interest Rates and Bond Values. Bond duration and Interest Rate Sensitivity.

Valuing stock: Value of a Common Stock and the Dividend Discount Model: Zero Growth, Constant Growth and Multiple Growth Models.

Linkage between Share Price, Earnings and Dividends. The significance of Price-Earnings Ratio

**Unit-3: Measuring Risk and Return**

Risk of a stock. Measures of risk: Volatility of a stock and a stock portfolio. Beta of a stock and a stock portfolio.

Portfolio Risk -Return Analysis: Two Asset Case. Efficient Portfolio and Mean-Variance Criterion.

The Capital Asset Pricing Model and its implications. The Arbitrage Pricing Theory.

Determinants of Beta.

#### **Unit-4: Principles of Risk Management**

The Risk Management Process. Dimensions of risk transfer: Hedging , Insurance and its basic features. *Financial Guarantees, Caps & Floors on Interest Rates, Options as Insurance*. The Diversification Principle.

The Derivative Market. Traders in a Derivative Market; Hedgers, Speculators and Arbitrageurs. Instruments in the derivative market.

#### **Unit-5: Mechanics of Futures Market**

Forward and Futures Contracts. Convergence of Futures Price and Spot Price. Margin Operation. Traders and their Orders . Short and Long Hedges. Basis Risk. Cross Hedging Hedging Strategies with Interest Rate Futures and Stock Index Futures. Speculating with Interest Rate Futures and Stock Index futures. Arbitrage with Stock Index Futures.

Risk of Trading Futures Contracts.

#### **Unit-6: Options and Swaps**

Call Option and Put Option. Combining Put, Call and Share: *Straddle, Strangle and Spread*.

Spread combining Long and Short Options.

Factors determining Option prices. The Binomial Option Pricing Model and the Black-Scholes Model for Call Options.

Nature of Swaps: *Currency Swaps and Interest Rate Swaps*

#### **Unit-7: Bank Management and Performance Evaluation.**

Interest Rate Risk and its Assessment. Methods to reduce Interest Rate Risk.

Credit Risk and its management through diversification. Measuring Market Risk and its management. Valuation of Commercial Bank.

Evaluating Bank Performance: Return on Assets and Return on Equity. Bank Failures.

- **Only students completing course ECO-3046 are eligible to opt for this course**

#### **Course Outcomes**

- This paper builds on the foundations laid down in Paper ECO 3046, and helps the students to better develop their understanding of the financial system and its functioning
- The describe the process of investing in securities and assets in terms of investment policy, security analysis, portfolio construction, portfolio revision and portfolio evaluation
- It interpret the principles of market valuation of debt instruments as well as valuation of stocks

- To measure risk and return of financial assets, in particular risk of a stock, volatility of a stock and stock portfolio, capital asset pricing model and its implications, arbitrage pricing theory and determinants of beta
- To analyse the technicalities regarding the mechanics of futures market in terms of convergence of futures price and spot price, margin operation, hedging strategies and arbitrage with stock index futures, along with various measures relating to bank management and performance evaluation

#### **Recommended Readings:**

1. Alexander G. J, Sharpe W. F. & Bailey J. V. (2001) *Fundamentals of Investments*. Pearson Education.
2. Bodie Z, Merton R. C. & Cleeton D. L. (2009) *Financial Economics*. Pearson/ Prentice Hall.
3. Hull J. C. & Basu S. (2010) *Options, Futures and Other Derivatives*. Pearson.
4. Madura J. (2006) *Financial Institutions and Markets*. Thomson.
5. Panday I.M.( 2005) *Financial Management* . Vikas.

## **ECO 4086**

### **Indian Economy: Post Independence Evolution and Present Perspective**

#### ***(Open Course)***

*(This paper has been designed to give a perspective on the Indian Economy to students of other disciplines. It is expected to be helpful for students who are preparing for competitive examinations. Moreover it is envisaged that it would give a general understanding of the basic issues of the Indian economy to the others)*

#### **Unit – 1: Basic Concepts for Understanding an Economy:**

Ideas of National and Domestic Income, Gross and Net Domestic Product, at Current and Constant Prices, the Rate of Growth of an Economy; Growth and Development, Per Capita Income as a Measure of Economic Development; the Notion of Purchasing Power Parity; Human Development and its Measurement, Inequality and its Measurement; Income Poverty and Poverty Head Count Ration, Multi-Dimensional Poverty; Unemployment and Unemployment Rate; Inflation and Inflation Rate

#### **Unit – 2: Development Strategy in Post Independent India**

Basic features of the Indian Economy at the time of Independence, The Strategy of Rapid industrialization through Planning and Expansion of the Public Sector, the trickle down effect theory, Performance of the Economy during 1951-80, Need for strategy change – Limited

liberalization and special programmes targeting Rural Unemployment and Poverty, The Basic Idea of State versus Market Debate, Economic Liberalization and Opening up of the Economy, Growth and Developmental experience in the Post-liberalization period

### **Unit – 3: Sectoral Policies and Experiences**

Agrarian reforms, Green Revolution, the Agrarian Crisis: Composition of the service sector – The telecommunication revolution and the IT sector; The Tax System and Fiscal Reforms; The Capital Market, SEBI and the Stock Exchanges; the Banking and Insurance Sectors and Reforms

### **Unit – 4: India and the Rest of the World**

The Ideas of the balance of Payment, Current and capital Accounts, WTO and India, Trends in FDI and FII flows, The Present Exchange Rate System, The Post 2008 Global Economic Environment and India

### **Course Outcomes**

- The paper has been designed to give a perspective on the Indian Economy to students of other disciplines. It is expected to be helpful for students who are preparing for competitive examinations.
- It is envisaged that it would give a general understanding of the basic issues of the Indian economy to the others.
- To relate theoretical learning with actual economic situation
- To interpret and analyse the strategies and sectoral policies adopted in the Indian economy since independence.

### **Recommended Readings:**

1. NCERT, *Evolution of the Indian Economy*, NCERT, New Delhi
2. ArvindPanaghariya, *India: the Emerging Giant*, Oxford University Press
3. UNDP, *Human Development Report 2010* (Technical Notes)[accessible from [www.undp.org](http://www.undp.org)]
4. *Economic and Political Weekly*(relevant Issues)[topic-wise search in the achieve can be activated from [www.epw.in](http://www.epw.in). The full articles, if needed, can then be downloaded from [www.jstor.org](http://www.jstor.org)]
5. Ministry of Finance, Government of India, *Economic Survey* (Relevant volumes) [can be accessed from <http://indiabudget.nic.in>]

**ECO 4106**  
**ECONOMICS OF HEALTH**  
*[Elective]*

**Unit – 1: Introduction to Health Economics**

Rationale for Economics of Health. Nature of Health Economics: *Information Asymmetry, Health Insurance, Process Utility and Disparity in Access.*

Health and Development. Health and Income: *The two way linkage.*  
Health Care as an economic commodity.

**Unit – 2: Demand for Health Care**

Determining the demand for health care. Elasticity of the demand curve for health.

The Grossman Model: *production possibility frontier, health production schedule, the labor –leisure –health improvement tradeoff, the marginal efficiency of capital.* Unifying the Grossman Model.

**Unit – 3: Supply of Health Care**

Creating the Physician: *Medical School and Residency.*

Physician work hours and wages. Returns to medical training and specialization.

Market Distortions: *barriers to entry, physician induced demand, defensive medicine and discrimination.*

Organization of a modern hospital. The market for hospitals.

**Unit – 4: Health Insurance**

Uncertainty and Insurance. Comparing Insurance Contracts.

The role of asymmetric information.

Adverse Selection: *Akerlof's Market for Lemons, Rothschild-Stiglitz Model.*

Moral Hazard and its magnitude. Limiting moral hazard: *coinsurance and copayment, deductibles, monitoring and gate keeping.*

**Unit – 5: Innovations in the Health Industry and their Outcomes**

Pharmaceutical innovations and its costs. Patents as an incentive.

Technology and the Price of Health Care. Technology Overuse: *The Dartmouth Atlas.*

Health Technology Assessment: *Cost Effectiveness Analysis and Cost-Benefit Analysis*

## **Unit – 6: Health Policy**

The Health Policy Trilemma: *Health, Wealth and Equity*.

Strategies for an optimal Health Insurance System. Regulating health care provision.

Controlling costs through price controls.

### **Course Outcomes**

- Given the fact that resources for meeting health requirements are scarce, and the future is uncertain, this course intends to enable students to look at health related aspects from an economic perspective
- It covers core topics such as information asymmetry, health insurance, disparity in access to health care, and tries to explain, among others, why educated people experience better health and the aging experience declining health
- It helps the students to draw connections between the theoretical models and health policy debates around the world

### **Recommended Readings:**

1. Bhattacharya J, Hyde T and Tu P (2014) *Health Economics*, New York, Palgrave Macmillan.
2. Folland S, Goodman AC and Stano M (2013) *The Economics of Health and Health Care* New Jersey USA, Pearson.
3. Jack, W (1999) *Principles of Health Economics for Developing Countries*. Washington DC, WBI Development Studies, World Bank.
4. McGuire A, Henderson J and Mooney G (1988) *The Economics of Health Care. An Introductory Text*. London, Routledge .

**ECO 4116**

**ENVIRONMENT AND ENERGY ECONOMICS**

*[Elective]*

### **Unit – 1: Environment and Economy Linkage:**

Environment as a source of resources and energy-Earth, life and biosphere, Ecosystem, components of Ecosystem: Biotic Environment, Abiotic Environment, Inorganic Substances, Organic Substances; Climate Condition and Limiting Factors; Soil, Energy, Biodiversity.

Concept of Energy and its Role in the Biosphere; Energy Flow along Food Chain.

**Unit – 2: Environmental problems**

Local and Global Environmental Problems: Air Pollution, Water Pollution, Noise Pollution, Light Pollution; Climate change , Global warming ,Loss of biodiversity.

**Unit – 3: Environmental Management**

Management Systems for Environment: Command and Control, Market Based Instruments, Community Management; Environmental Impact Management. International Conventions and Protocols.

**Unit – 4: Energy Demand Management**

Definition, Evolution, Justification-Load Management-Energy Efficiency Improvements and Energy Conservation-Cost-effectiveness-Energy efficiency debate

**Unit – 5: Economics of Energy Supply**

Economic analysis of energy instruments- Economics of fossil fuel supply, electricity supply, renewable energy supply, non-renewable resource supply etc.

**Unit – 6: Student Presentations (based on case studies, empirical findings).****Course Outcomes**

- Assess the value of environmental resources
- Analyse the ill effects of excessive use of energy
- Deliberate on the more efficient use of energy and the environmental resources
- To identify/quantify demand and supply factors of energy
- To develop models /policies for more efficient energy use by institutions

**Recommended Readings:**

1. Bhattacharyya, R.N. (ed)(2001) *Environmental Economics: An Indian Perspective*, Oxford New Delhi
2. Bhattacharyya, Subhes C. (2011) *Energy Economics - Concepts, Issues, Markets and Governance*, Springer New York
3. Sengupta, Ramprasad (2001) *Ecology and Economics: An Approach to Sustainable Development*, Oxford New Delhi
4. Singh, Katar, Shishodia Anil, (2007) “*Environmental Economics: Theory and Applications*” Sage texts

**ECO 4094**  
**Research Methodology for Social Science**  
*[Value Added]*

*This paper is expected to provide an understanding of the basic principles and methods of research in Social Sciences. Students of Anthropology, Economics, History, Political Science, Sociology, Women's Studies may find it useful to develop a strong research foundation.*

**Unit – 1: Meaning of Research, Research Foundations and Research Motivations**

Meaning of Research-Different definitions of Research; Research Foundations-Debating points-Abstract and Concrete Knowledge-Epistemological foundations-Quantitative and Qualitative Research-, Etic and Emic approaches; Research Motivations, Features, Norms and Assumptions

**Unit – 2: Objectives and Significance of Research**

Objectives of research, Research methods versus methodology, Research approaches - Types of research- Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative ,Conceptual vs. Empirical ,Other types of research, Qualities of a researcher, Significance of research.

**Unit – 3: Research Process**

Formulating the research problem: Sources of Ideas-Literature Review, Library and Web-sources, Constructing Frameworks, Role of Theory-Choosing a Research Topic-Developing Research Questions/Hypothesis- preparing the research design; determining sample design; collecting data; execution of the project; analysis of data; hypothesis testing; generalization and interpretation, preparation of the report or presentation of the results

**Unit – 4: Research Design**

Features of research design , Concepts relating to research design ,Types of research design -exploratory research design- descriptive and diagnostic research design hypothesis-testing research design; Characteristics of a good research design .Case study research, Hypothesis and its testing, Sample survey and sampling methods

**Unit-5: Data collection**

Sources of data: Primary Data -Methods of collecting primary data; Sources of secondary data- Published sources , Unpublished sources. Questionnaire and Sampling :Meaning of questionnaire. Drafting of questionnaire. Size of questions Clarity of questions Logical sequence of questions Simple meaning questions Other requirements of a good questionnaire , Meaning and essentials of sampling. Statistical Laws :the Law of Statistical Regularity , Law of Inertia of Large Numbers

### **Unit – 6: Data Processing**

Statistical Analysis- Probability -Probability distribution -Binomial distribution -Poisson distribution -Normal distribution Testing of Hypothesis -Small sample Large sample test ,Chi-square test ; Statistical Applications

### **Unit – 7: Report Writing and Presentation**

Structure and Components of Research Reports -Characteristics of a good report -Framework of a Report -Parts of a Research Report; Format and Presentation of a Report -Importance of Presentation of a Report -Common Components of a Format –Precautions-Presentation of Reports

### **Course Outcomes**

- Equip students inclined to do research with the procedure and discipline of a research activity

### **Recommended Readings**

1. Bhandarkar , P.L. and T.S. Wilkinson, *Methodology And Techniques Of Social Research*. Himalaya Publishing
2. Druckman , Daniel, *Doing Research*, Sage
3. Kothari, C.R., *Research Methodology: Methods and Techniques*, New Age International