

## **Course Title: Micro Economic Theory and Applications**

**Course Code: AEC-501**

**Credit Hours: 3(3+0)**

### **Theory**

#### **Basic Concepts: A review**

Scarcity and Choice; Production possibility frontier, Positive and normative economics; concepts of opportunity cost, Demand and Supply: determinants of individual demand/supply; demand/ supply schedule and demand/ supply curve; market versus individual demand/ supply; shifts in the demand/ supply curve

#### **Consumer Choice**

Cardinal Utility Approach – Ordinal Utility Approach -Budget sets and Preferences under different situations – Hicks and Slutsky income and substitution effects – Style: Applications of Indifference curve approach – Revealed Preference Hypothesis – Consumer surplus – Derivation of Demand curve – Elasticity of demand – Demand and supply together; how prices allocate resources; controls on prices – price floor and price ceiling – applications in agriculture

#### **Production and Cost**

Production functions: single variable - average and marginal product, variable proportions, stages of production. Two variables - isoquants, returns to scale and to a factor; factor prices; Technical progress; cost minimization and output maximization; Elasticity of substitution. Expansion path and the cost function Concept of economic cost; Short run and long run cost curves; increasing and decreasing cost industries; envelope curve; L-shaped cost curves; economies of scale; revenue and expenditure, elasticity and marginal revenue; Firm equilibrium and profit

#### **Market Forms**

Behaviour of profit maximizing firms and the production process- Perfect competition: Equilibrium of the market. Long run industry supply, applications: effects of taxes and subsidies; Monopoly: Equilibrium; supply; multi plant firm; monopoly power; deadweight loss; price discrimination; Monopolistic Competition: Product differentiation; equilibrium of the firm in the industry-with entry of new firms and with price competition. Comparison with pure competition. Duo ploy: Cournot model and reaction curves; Stackelberg's model, Bertrand model; Oligopoly

#### **Factor Markets**

Labour and land markets - basic concepts (derived demand, productivity of an input, marginal productivity of labour, marginal revenue product); demand for labour; input demand curves; shifts in input demand curves; competitive labour markets; Economic rent and quasi rent.

#### **Suggested Reading**

- Koutsoyiannis A. *Modern Micro Economics*. Macmillan Press Ltd Social Sciences: Agricultural Economics
- Ferguson and Gould. *Micro Economic Theory*. Richard D Erwin Inc., USA
- Richard A. Bilas, *Micro Economic Theory*.
- Leftwich Richard H. *The Price System and Resources Allocation*
- Allen CL. *A Frame Work of Price Theory*.

**Course Title: Agricultural Production Economics**  
**Course Code: AEC-502**  
**Credit Hours: 2 (1+1)**

**Theory**

**Concepts of production economics**

Nature, scope and significance of agricultural production economics- Agricultural Production processes, character and dimensions-spatial, temporal – Centrality of Production functions, assumptions of production functions, commonly used forms -Properties, limitations, specification, estimation and interpretation of commonly used production functions.

**Factors and theory of production**

Factors of production, classification, interdependence, and factor substitution-Determination of optimal levels of production and factor application- Optimal factor combination and least cost combination of production - Theory of product choice; selection of optimal product combination.

**Concepts of cost**

Cost functions and cost curves, components, and cost minimization -Duality theory– cost and production functions and its applications -Derivation of firm's input demand and output supply functions -Economies and diseconomies of scale.

**Dynamics of economic assessment**

Technology in agricultural production, nature and effects and measurement -Measuring efficiency in agricultural production; technical, allocative and economic efficiencies - Yield gap analysis-concepts-types and measurement - Nature and sources of risk, modeling and coping strategies.

**Practical**

- Different forms of production functions
- Specification, estimation and interpretation of production functions
- Returns to scale, factor shares, elasticity of production
- Physical optima-economic optima
- Least cost combination
- Optimal product choice
- Cost function estimation, interpretation
- Estimation of yield gap
- Incorporation of technology in production functions
- Measuring returns to scale-risk analysis.

**Suggested Reading**

- EO Heady. *Economics of Agricultural Production and resources use*.
- John P Doll and Frank Orazem. *Production Economics: Theory with application*
- Heady EO & Dillon JL. 1961. *Agricultural Production functions*. Kalyani Publishers, Ludhiana, India. 667 p.
- Baumol WG. 1973. *Economic theory and operations analysis*. Practice Hall of India Private Limited, New Dehli.626 p.
- Gardner BL &Rausser GC. 2001. *Handbook of Agricultural Economics Vol. I Agricultural Production*. Elsevier.

**Course Title: Macro Economics and Policy**  
**Course Code: AEC-504**  
**Credit Hours: 2(2+0)**

**Theory**

**Introduction: Measurement and Concepts**

Basic concepts and scope of Macro-economics, National Income Accounting: Methods of measurement of key macro-economic aggregates, relationship of national income and other aggregates (with numerical exercises), real and nominal income

**Classical Macroeconomics**

Say's Law, Quantity Theory of Money, aggregate labour supply and demand of labour, Classical theory of determining output, wages and prices.

**Income And Spending: Keynesian Framework**

Simple Keynesian model of income determination; Keynesian Multiplier- aggregate spending, taxation, transfer payments, foreign spending, balanced budget; budget surplus (with numerical exercises).

**Money, Interest and Income**

Goods market equilibrium-IS curve; Demand for Money, the Liquidity Preference Theory – Liquidity Trap; asset market equilibrium- LM curve; simultaneous equilibrium in goods and asset market- effect of fiscal and monetary policy

**Theories of Aggregate Consumption and Investment**

Absolute Income Hypothesis, Relative Income Hypothesis, Fisher's Inter-temporal Choice Model, Life-Cycle and Permanent Income Hypotheses; Profits and Accelerator Theory.

**Inflation and Unemployment**

Inflation: Nature, Effects and control; Types of inflation – demand pull, cost push stagflation, core inflation, hyperinflation; Phillips curve.

**Suggested Reading**

- Stonier & Hague. *A Text Book of Economic Theory*
- Samuelson PA. 1948. *Foundation of Economic Analysis*. Harvard University Press
- MC Vaish Allid. 1983. *Macro-Economics Theory*
- Gardner Ackley. 1961. *Macro-Economics Theory*: Macmillan, New York.
- TF Dernburg & DM McDougali-*Macro Economics*
- G. Sirkin – *Introduction to Macro-Economics Theory*
- RL Heibroker-*Understanding Macro-Economics*
- JK Mehta –*Macro Economics*
- Michael R Edgemand – *Macro-Economics: Theory & Policy*
- David' W Pearce –*The dictionary of modern Economics*

**Course Title: Econometrics**  
**Course Code: AEC 505**  
**Credit Hours: 3 (2+1)**

**Theory**

**Introduction**

Relationship between economic theory, mathematical economics, models and econometrics, methodology of econometrics-regression analysis.

**Classical Linear Regression**

Basic two variable regression – assumptions estimation and interpretation approaches to estimation – OLS and their properties – extensions to multi-variable models-multiple regression estimation and interpretation

**Breaking down of Classical assumptions**

Violation of assumptions – identification, consequences and remedies for Multicollinearity, heteroscedasticity, autocorrelation – data problems and remedial approaches – model misspecification

**Qualitative variables and simultaneous equation models**

Use of dummy variables- Introduction to simultaneous equations- identification problem

**Practical**

- Single equation two variable model specification and estimation
- Hypothesis testing transformations of functional forms and OLS application
- Estimation of multiple regression model
- Testing and correcting specification errors
- Testing and managing Multicollinearity
- Estimation of regressions with dummy variables

**Suggested Reading**

- Dorfman R. 1996. *Linear Programming and Economic Analysis*. McGraw Hill.
- Greene WH. 2002. *Econometric Analysis*. Pearson Education.
- Johnston J and Dinardo J. 2000. *Econometric Methods*. McGraw-Hill.
- Koutseyianis, A. 1997. *Theory of Econometrics*. Barner & Noble.
- Maddala GS. 2002. *Econometrics*. McGraw-Hill.
- Pinndyck RS and Rubinfeld DL. 1990. *Econometric Models and Econometric Forecasts*. McGraw Hill.

**Course Title: Agricultural Finance and Project Management**

**Course Code: AEC 507**

**Credit Hours: 3 (2+1)**

**Theory**

**Basic concepts: A Review**

Role and Importance of Agricultural Finance. Financial Institutions and credit flow to rural/priority sector. Agricultural lending – Direct and Indirect Financing -Financing through Co-operatives, NABARD and Commercial Banks and RRBs. District Credit Plan and lending to agriculture/priority sector. Micro-Financing and Role of MFI's - NGO's, and SHG's.

**Credit and its aspects**

Lending to farmers – The concept of 3 C's, 7 P's and 3 R's of credit. Estimation of Technical feasibility, Economic viability and repaying capacity of borrowers and appraisal of credit proposals. Understanding lenders and developing better working relationship and supervisory credit system. Credit inclusions – credit widening and credit deepening.

**Financial analysis**

Financial Decisions – Investment, Financing, Liquidity and Solvency. Preparation of financial statements - Balance Sheet, Cash Flow Statement and Profit and Loss Account. Ratio Analysis and Assessing the performance of farm/ firm.

**Project Overview**

Project Approach in financing agriculture. Financial, economic and environmental appraisal of investment projects. Identification, preparation, appraisal, financing and implementation of projects. Project Appraisal techniques – Undiscounted measures. Time value of money – Use of discounted measures - B-C ratio, NPV and IRR .Agreements, supervision, monitoring and evaluation phases in appraising agricultural investment projects. Net work Techniques – PERT and CPM

**Risk and its Management**

Risks in financing agriculture. Risk management strategies and coping mechanism. Crop Insurance programmes – review of different crop insurance schemes – yield loss and weather based insurance and their applications

**Practical**

- Development of Rural Institutional Lending;
- Branch expansion, demand and supply of institutional agricultural credit and Over dues and Loan waiving;
- An overview, Rural Lending Programmes of Commercial Banks, Lead Bank Scheme;
- Preparation of District Credit Plan, Rural Lending Programmes of Co-operative Lending Institutions;
- Preparation of financial statements using farm/firm level data, Farm credit appraisal techniques and farm financial analysis through financial statements;
- Performance of Micro Financing Institutions;
- NGO's and Self-Help Groups, Identification and formulation of investment projects;
- Project appraisal techniques – Undiscounted Measures and their limitations;
- Project appraisal techniques – Discounted Measures;
- Network techniques – PERT and CPM for project management;
- Case Study Analysis of an Agricultural project;
- Financial Risk and risk management strategies – crop insurance schemes;
- Financial instruments and methods – E banking, Kisan Cards and core banking.

**Course Title: Linear Programming**  
**Course Code: AEC-508**  
**Credit Hours :2 (1+1)**

**Theory**

**Unit I**

Decision Making- Concepts of decision making, introduction to quantitative tools, Introduction to linear programming, uses of LP in different fields, graphic solution to problems, formulation of problems.

**Unit II**

Simplex Method: Concept of simplex Method, solving profit maximization and cost minimizations problems. Formulation of farms and non-farm problems as linear programming models and solutions.

**Unit III**

Extension of Linear Programming models: Variable resource and price programming, transportation problems, recursive programming, dynamic programming.

**Unit IV**

Game Theory- Concepts of game theory, two-person constant sum, zero sum game, saddle point, solution to mixed strategies, the rectangular game as Linear Programming.

**Practical**

- Graphical and algebraic formulation of linear programming models.
- Solving of maximization and minimization problems by simplex method.
- Formulation of the simplex matrices for typical farm situations.

**Course Title: Research Methodology for Social Sciences**  
**Course Code: AEC 509**  
**Credit Hours: 2 (1+1)**

**Theory**

**Concepts of research methodology**

Importance and scope of research in agricultural economics. Types of research –Fundamental vs. Applied. Concept of researchable problem – research prioritization– selection of research problem. Approach to research – research process.

**Hypothesis: Framing and Testing**

Hypothesis – meaning – characteristics – types of hypothesis – review of literature– setting of Course Objective and hypotheses – testing of hypothesis.

**Sampling**

Sampling theory and sampling design – sampling error - methods of sampling –probability and non-probability sampling methods - criteria to choose. Project proposals – contents and scope – different types of projects to meet different needs– trade-off between scope and cost of the study. Research design and techniques– Types of research design.

**Data Collection**

Data collection – assessment of data needs – sources of data collection – discussion of different situations. Mailed questionnaire and interview schedule – structured, unstructured, open ended and closed-ended questions. Scaling Techniques. Preparation of schedule – problems in measurement of variables in Agriculture. Interviewing techniques and field problems - methods of conducting survey –

Reconnaissance survey and Pre testing

**Data Analysis**

Data coding, tabulation, cleaning. –Multivariate analysis –factor analysis’ PCA’ cluster analysis. Universal procedures for preparation of bibliography – writing of research articles.

**Practical**

- Exercises in problem identification.
- Project proposals – contents and scope.
- Formulation of Objective and hypotheses.
- Assessment of data needs – sources of data – methods of collection of data.
- Methods of sampling – criteria to choose – discussion on sampling under different situations.
- Scaling Techniques – measurement of scales.
- Preparation of interview schedule.
- Field testing. Method of conducting survey.
- Exercise on coding, editing, tabulation and validation of data.
- Preparing for data entry into computer.
- Hypothesis testing – Parametric and Non-Parametric Tests.
- Exercises on format for Thesis/ Report writing.
- Presentation of the results.

**Suggested Reading**

- Baker CB. *Research Methodology in Agricultural Economics*
- Cohen MR and Nagel R. *An Introduction to Logic and Scientific Method*

- Devey J Logic. *The Theory of Enquiry*
- Dhondhyal SP. *Social Science Research and Thesis Writing*
- Ezekiel M. *Correlation Analysis*
- Heady EO. *Linear Programming Methods*
- Willson ER. *An Introduction to Scientific Research*
- Kumar A. 2008. *Research Methodology: A Survey*. Alts, New Delhi,



**Course Title: Natural Resource and Environmental Economics**

**Course Code: AEC 513**

**Credit Hours: 2 (1+1)**

**Theory**

**Basic Foundation**

Concepts, Classification and Problems of Natural Resource Economics – Economy Environment interaction – The Material Balance principle, Entropy law-Resources Scarcity - Limits to Growth - Measuring and mitigating natural resource scarcity– Malthusian and Recardian scarcity – scarcity indices - Resource Scarcity and Technical Change.

**Theories and economics of natural resources**

Theory of optimal extraction renewable resources –economic models of oil extraction efficiency- time path of prices and extraction - Hotelling’s rule, Solow-Harwick’s Rule. Theory of optimal extraction exhaustible resources – economic models of forestry and fishery.

**Functioning of Market**

Efficiency and markets – market failures - externalities – types - property rights– transaction costs – Coase’s theorem and its critique - public goods – common property and open access resource management - Collective action.

**Environmental Issues**

Environmental perspectives - biocentrism, sustainability, anthropocentrism -Environmental problems and quality of environment - Sources and types of pollution-air, water, solid waste, land degradation – environmental and economic impacts- Economics of pollution control - efficient reduction in environmental pollution.

**Regulations**

Environmental regulation – economic instruments - pollution charges – Pigovian tax - tradable permits – indirect instruments – environmental legislations in India.

**Sustainability aspects**

Concept of sustainable development – Economic Perspective – Indicators of sustainability Relation between development and environment stress-Environmental Kuznet’s curve Environmental Accounting – resource accounting methods –International Environmental Issues – climate change – likely impacts – mitigation efforts and international treaties.

**Practical**

- Exhaustible resource management – optimum rate of oil extraction.
- Renewable resource management – optimum harvest of Forestry/fishery.
- Exercise on pollution abatement-I.
- Exercise on pollution abatement-II.
- Concepts in valuing the environment.
- Taxonomy of valuation techniques.
- Productivity change method – substitute cost method – Hedonic price method – Travel cost method – Contingent valuation methods.
- Discount rate in natural resource management.
- Environment impact assessment
- Visit to Pollution Control Board.

**Suggested Reading**

- Pearce DW and Turner RK. *Economics of Natural Resource and Environment*
- Kwak J. *Economism: Bad Economics and the Rise of Inequality*
- Tietenberg T and Lewis L. *Environmental and Natural Resource Economics*
- Schwarz PM. *Energy Economics*

**Course Title: Commodity Future Trading Credits**

**Course Code: AEC 514**

**Credit Hours: 2 (2+0)**

**Theory**

**Concepts of commodity future trading**

History and Evolution of commodity markets – Terms and concepts: spot, forward and futures Markets – factors influencing spot and future markets. Speculatory mechanism in commodity futures.

**Technical aspects**

Transaction and settlement – delivery mechanism - role of different agents – trading strategies -potential impact of interest rate, Foreign Exchange, FDI in Commodity Markets.

**Risk and its Management**

Risk in commodity trading, importance and need for risk management measures- managing market price risk: hedging, speculation, arbitrage, swaps - pricing and their features.

**Commodity Exchange – A review**

Important global and Indian commodity exchanges - contracts traded – special features -Regulation of Indian commodity exchanges - FMC and its role.

**Analysis of commodity market**

Fundamental Vs Technical analysis – construction and interpretation of charts and chart patterns for analyzing the market trend – Market indicators – back testing. Introduction to technical analysis software – analyzing trading pattern of different commodity groups.

**Suggested Reading**

- Kaufman PJ. *The Concise Handbook of Futures Markets*: Jhon Wiley & Sons
- Purcell WD. *Agricultural Futures and Options: Principles and Strategies*: MacMillan Publications
- Wasendorf RR & McCaffery *All About Commodities from the Inside Out*. McGraw Hill

**Course Title: Development Economics**  
**Course Code: AEC-515**  
**Credit Hours: 2 (2+0)**

**Theory**

**Conceptions of Development**

Development Economics – Scope and Importance - Economic development and economic growth - divergence in concept and approach - Indicators and Measurement of Economic Development –GNP as a measure of economic growth – New Measures of Welfare – NEW and MEW – PQLI – HDI – Green GNP - Criteria for under development – Obstacles to economic development –Economic and Non-Economic factors of economic growth- Development issues, poverty, inequality, unemployment and environmental degradation

**Theories of Economic growth and development**

Classical theories- Adam Smith - Ricardo- Malthus, Marx's theory of economic development; Schumpeter's theory, Approaches to development- low income equilibrium trap - critical minimum effort- The Strategy of economic development- Balanced vs. Unbalanced growth, choice of technique, investment criteria, big push theory, Rostow's stages of Economic Growth, unlimited supply of labour; social and technological dualisms; roles of capital accumulation, human capital and technological change in economic development, Models of economic growth Harrod- Domar, Kaldor, Mahalanobis, Lewis, Fei Ranis, Input-Output, multisectoral models

**Comparative Economic Development**

Countries selected for case studies -USA, Japan, China and India; Overview of economic development in selected countries; agrarian surplus and the role of the peasantry in economic development; industrial revolution; division of labour, organisation of work and industrial production, the role of the State in developmental transition

**Suggested Reading**

- Blaug M. 1986. *Economic History and the History of Economic Thought*
- Chenery HB and TN Srinivasan. *Handbook of Development Economics*
- Baldwin RE. *Economic Development and Growth*. John Wiley, New York