

Ph. D. in AGRICULTURAL ECONOMICS

Course Structure - At a Glance

S N.	Course No.	Course Title	Cr Hr's
A.	CORE COURSES (10 Credits)		
1.	AEC - 601	ADVANCED MICRO-ECONOMIC ANALYSIS	2 (1+1)
2.	AEC - 602	ADVANCED MACRO-ECONOMIC ANALYSIS	2 (2+0)
3.	AEC - 603	ADVANCED ECONOMETRICS	3 (2+1)
4.	AEC - 604	ADVANCED PRODUCTION ECONOMICS	3 (2+1)
B.	OPTIONAL COURSES (05 Credits)		
5.	AEC - 605	ADVANCED AGRICULTURAL MARKETING AND PRICE ANALYSIS	3 (2+1)
6.	AEC - 606	QUANTITATIVE DEVELOPMENT POLICY ANALYSIS	2 (1+1)
7.	AEC - 607	COMMODITY FUTURES TRADING	2 (2+0)
8.	AEC - 608	NATURAL RESOURCE MANAGEMENT	2 (1+1)
9.	AEC - 609	ENVIRONMENTAL ECONOMICS	3 (2+1)
10.	AEC - 610	SEMINAR (MAJOR DISCIPLINE)	1 (1+0)
11.	AEC - 611	SEMINAR (MINOR DISCIPLINE)	1 (1+0)
12.	AEC - 700	RESEARCH WORK (THESIS)	45 (45+0)

Total Credit from Major Discipline : 15

Total Credit from Minor Discipline : 08

Total Credit from Supporting Discipline : 05

Total Credit for Seminar : 02

Total Credits for Research Work (Thesis Work) : 45

Total Credit Required for Ph. D. Degree

75 _____

(A). CORE COURSES

AEC - 601 ADVANCED MICRO ECONOMIC ANALYSIS 2 (1 + 1)

Objectives

The Course Objective of this course is to introduce the theoretical models and applications of microeconomic theory. In particular, the basic comparative statistical techniques and the more modern duality theory will be developed and applied to the models of maximization, unconstrained and constrained utility maximization, expenditure minimization, constrained profit maximization and cost and expenditure minimization. These mathematical structures form the basic building blocks of neoclassical economics; this course will stress the development and application of these important models. We follow a calculus rather than a graphical approach to the theory. In the subsequent sections of the course, we provide a fairly rigorous exposure to price determination under different market situations, general equilibrium theory, causes and consequences of market failure and welfare economics including the theory of public choice.

Theory

Theory of consumer behaviour - Duality in consumer theory - expenditure function and indirect utility function - Measurement of Income Effect and Substitution Effect. Measurement of Changes in Consumers' Welfare - Consumer's Surplus, Compensating Variation and Equivalent Variation - Dynamic versions of demand functions - Integrability of demand functions. Demand Models - Linear Expenditure System, Almost Ideal Demand System. Applications of consumer theory - Household model and time allocation - Labour supply decisions by households.

Perfect competition - Monopoly, monopolistic competition and oligopoly. Oligopoly models - collusive and non-collusive models of oligopoly - Cournot model, Chamberlin model, Stackleberg solution.

General equilibrium theory - Conceptual overview - General equilibrium conditions with Production and Consumption. Existence, Uniqueness and Stability of general competitive equilibrium. Walrasian general equilibrium - Mathematical derivation of conditions for general equilibrium.

Market failure - Incomplete markets - Asymmetric information - Principal - Agent problem, adverse selection and moral hazard. Externalities - Network externalities - Public goods - Optimal provision of public goods.

Welfare Economics - Concepts, problems, approaches and limitations of Welfare Economics, Pareto conditions of maximum welfare - Criteria for social welfare - Social Welfare functions, Social versus Private costs and benefits.

Practical

Problems in consumer utility maximization - Estimation of income and substitution effects; Estimation and comparison of Consumer's surplus, equivalent variation and compensating variation. Estimation of demand models - Derivation and estimation of labour supply equations from household models comparative static analysis in consumption. Advanced problem solving in price determination under perfect competition, monopoly, oligopoly and monopolistic competition. Game theory models. Problems solving in General Equilibrium Theory and Welfare Economics. Problems in public goods provision.

Suggested Readings

- Chiang AC. 1981. *Fundamental Methods of Mathematical Economics*. McGraw - Hill.
 Henderson JM & Quandt RE. *Microeconomic Theory: A Mathematical Approach*. McGraw-Hill.
 Koutsoyiannis A. 2003. *Modern Microeconomics*. The Macmillan Press.
 Kreps DM. 1990. *A Course in Microeconomic Theory*. Princeton Univ. Press.
 Silberberg E & Suen W. 2001. *The Structure of Economics - A Mathematical Analysis*. McGraw-Hill.
 Varian HR. 1992. *Microeconomic Analysis*. WW Norton & Co.
 Varian HR. 1999. *Intermediate Microeconomics*. Affiliated East-West Press.

AEC - 602 ADVANCED MACRO ECONOMICS ANALYSIS 2 (2 + 0)

Objective

Advanced macroeconomics course will be offered to PhD students of Agricultural Economics with the following Course Objective:

- to understand the macroeconomic theory
- to examine the macroeconomic Policy issues
- to analyze the macroeconomic Policy implications

Theory

Review of Macro Economics concepts-Comparative statistics - Keynesian theory - Consumption Function and Theories of Consumption - Saving Function and Theories of Saving.

Theories of Investment-Savings and Investment Equality - IS - LM Framework and its demand for and Supply of Money - Monetary Policy in the static model - Inflation.

Stagflation and Supply side Economics - Theory of Unemployment - Phillips Curve controversy - Inflation, Productivity and distribution - Fiscal policy: Effectiveness and Problems.

Social Accounting Matrix Framework - General Equilibrium Analysis - Neo classical Macro Economics - Stochastic Macro Economics.

BOP & Adjustment Policies - Foreign Exchange Policy - Foreign sector : Capital and Current Account - Impact of WTO on Indian Economy - Impact of IMF & IBRD on Indian Economy - Review of Macro Economic Policies in India.

Suggested Readings

- Diulio EA. 2006. *Macroeconomics*. 4th Ed. Schaums' Outlines.
 Frogen RT. 1999. *Macro Economic: Theory and Policies*. 6th Ed. Prentice Hall.
 Samuelson PA & Nordhaus WD. 2004. *Economics*. McGraw-Hill.
 Shapiro E. 1989. *Macro Economic Analysis*. Galgotia Publ.

AEC - 603 ADVANCED ECONOMETRICS 3 (2 + 1)

Objective

The Course Objective of the course is to impart knowledge on advanced econometric tools to the Research Scholars of agricultural economics. Training in advanced econometrics will help the Research Scholars to analyze the economic problem by applying quantitative techniques.

Theory

Review of classical regression model - review of hypothesis testing - restrictions on parameters - single equation techniques.

Ordinary least squares - weighted least squares - generalized least squares - method of principal components - instrumental variables method - maximum likelihood method - errors in variables, non-linearity and specification tests - non spherical error terms.

Dummy variables - Qualitative and truncated dependent variables - limited dependent variables - LPM, probit and logit models, their multinomial extensions.

Autoregressive distributed lag models - panel data fixed and random effects models and their extensions.

Simultaneous equation methods - identification - estimation by indirect least squares 2SLS, PIML, SURE, 3SLS.

Practical

Estimation of multiple regression model - GLS estimation methods - testing misspecification errors - Testing and Managing multicollinearity, heteroscedasticity and autocorrelation - estimation of LPM, Logit and Probit models - comparing two regressions - Chow test - estimation of distributed lag models - panel data random and fixed effects models - Indirect least squares 2SLS, SURE, 3SLS, estimation of simultaneous equation models.

Suggested Readings

Greene WH. 2002. *Econometric Analysis*. Pearson Edu.
 Johnston J & Dinardo J. 2000. *Econometric Methods*. McGraw-Hill.
 Kelejan HH & Oates WE. 2001. *Introduction to Econometrics Principles and Applications*. Harper & Row.
 Maddala GS. 2002. *Econometrics*. McGraw Hill.

AEC - 604 ADVANCED PRODUCTION ECONOMICS 3 (2 + 1)

Objective

To expose the students to the concept, significance and uses of advance production economics.

Theory

Agricultural Production process - Relationship between farm planning and production economics-scope of agricultural production and planning methods / procedures in agro -economic research and planning.

Production functions, components, assumptions, properties and their economic interpretation - Concepts of homogeneity, homotheticity, APP, MPP, elasticities of substitution and their economic relevance - Production relations - optimality - Commonly used functional forms, nature, properties, limitations, estimation and interpretation -linear, Spillman - Cobb Douglas, quadratic, multiplicative (power) functional forms - Translog, and transcendental functional forms - CES, production functional forms -Conceptual and empirical issues in specification, estimation and application of production functions- Analytical approaches to economic optimum - Economic optimum - determination of economic optimum with constant and varying input and output prices - Economic optimum with production function analysis - input use behaviour.

Decision making with multiple inputs and outputs - MRT and product relationship-cost of production and adjustment in output prices-single input and multiple product decisions - Multi input, and multi product production decisions - Decision making with no risk - Cost of wrong decisions - Cost curves - Principles and importance of duality theory - Correspondence of production, cost, and profit functions - Principles and derivation of demand and supply functions.

Technology, input use and factor shares - effect of technology on input use decomposition analysis - factor shares - estimation methods - Economic efficiency in agricultural production - technical, allocative and economic efficiency - measurement -Yield gaps analysis - concepts and measurement - Risk and uncertainty in agriculture - incorporation of risk and uncertainty in decision making - risk and uncertainty and input use level-risk programming.

Simulation and programming techniques in agricultural production - Multiple Course Objective Programming - Goal programming and Compromise programming - applications.

Practical

Estimation of different forms of production functions - Optimal input and product choice from estimated functions - Derivation of demand and supply functions and estimation-Estimation of cost function and interpretations - Optimal product and input choice under multi input and output system-Estimation of factor shares from empirical functions estimated - Estimating production functions incorporating technology changes: Decomposition analysis and incorporation of technology - Estimation of efficiency measures - Stochastic, probabilistic and deterministic frontier production functions-Risk programming - MOTAD - Quadratic programming-Simulation models for agricultural production decisions - Goal programming - Weighted, lexicographic and fuzzy goal programming - Compromise programming.

Suggested Readings

Chambers RG. 1988. *Applied Production Analysis*. Cambridge Univ. Press.
 Gardner BL & Rausser GC. 2001. *Handbook of Agricultural Economics*. Vol. IA *Agricultural Production*. Elsevier.
 Palanisami KP, Paramasivam & Ranganathan CR. 2002. *Agricultural Production Economics: Analytical Methods and Applications*. Associated Publishing Co.

(B). OPTIONAL COURSES

AEC - 605 QUANTITATIVE DEVELOPMENT POLICY ANALYSIS 2 (1 + 1)

Objective

- The course trains the Scholars in the art of informed decision making and helps them to appreciate the value of the analytical basis in policy decisions.
- They are given hands on training on the estimation and use of various criteria such as elasticities in making QDPA more meaningful
- The scholars make extensive reviews to get acquainted with the analytical relevance and in drawing inferences.

Theory

Policy framework - goals, value, beliefs and welfare maximization. Market - Policy and State - State vs. Market - Failure of Policy - Failure of Markets - Rationale for Government Intervention. Role of Quantitative Policy Analysis. Demand analysis for policymaking - Alternative approaches to demand analysis - Policy implications. Supply response - Alternative approaches to measurement of supply response - Nerlovian models of supply response - Policy implications.

Household behaviour and policy analysis - Household models.

Partial equilibrium analysis - Concept of reference prices - Price distortions - indicators and impact. Transaction costs - Implications for efficiency and productivity - Institutional solutions - Multi market approach to policy analysis.

Social Accounting Matrices and multipliers - Computable General Equilibrium models to assess economy wide impact of policy changes.

Practical

Review of criteria for policy evaluation - Estimation of price elasticities - Review of estimation of complete demand systems - Estimation of Nerlovian supply Response model - Review of Household models - Specification and estimation of household models - Partial equilibrium analysis - Input-output table - Social Accounting Matrix - Construction of a SAM - computation of Multipliers - Multi Market Analysis - Review of Computable General Equilibrium Models.

Suggested Readings

Chenery H & Srinivasan TN. (Eds.). 1988. *Hand book of Development Economics*. North-Holland.
 Eicher KC & Staatz JM. 1998. *International Agricultural Development*. Johns Hopkins Univ. Press.
 Fischer G, Miller J & Sidney MS. (Eds.). 2007. *Handbook of Public Policy Analysis: Theory, Politics and Methods*. CRC Press.
 Frank E. 1992. *Agricultural Policies in Developing Countries*. Cambridge Univ. Press.
 Ghatak S & Ingersent K. 1984. *Agriculture and Economic Development*. Select Book Service Syndicate.
 Kindleberger PC. 1977. *Economic Development*. McGraw Hill.
 Meier MG & Stiglitz JE. 2001. *Frontiers of Development Economics- the Future Perspective*. Oxford Univ. Press.
 Sadoulet E & de Janvry A. 1995. *Quantitative Development Policy Analysis*. London: John Hopkins Univ. Press.

Shoven Neck R, Christian R & Mooslechner P. (Eds.). 2008. *Quantitative Economic Policy Essays in Honour of Andrew Hughes Hallett*.

AEC - 606 ADVANCED AGRICULTURAL MARKETING AND PRICE ANALYSIS

3 (2 + 1)

Objective

The main Course Objective of this course is to critically analyze the important marketing concepts, models, properties of agricultural commodity prices and forecasting, data collection and analysis using current software etc., in order to make them policy decisions in the field of agricultural marketing.

Theory

Importance of market analysis in the agricultural system - types of marketing advantages and disadvantages - quantitative estimation - the distinguishing characteristics and role of agricultural prices - data sources for agricultural products and prices - softwares used in market analysis.

Role of various formal institutions in agricultural marketing - and functions - measuring their efficiency - public - private partnership - institutional arrangements. Successful case studies.

Multi market estimation, supply response models. Market integration and price transmission - supply / value chain management. GAP analysis. Current trends in information in the changing agrifood system.

Agricultural commodity marketing - spot and futures- marketing of derivatives -speculation, hedging, swap, arbitrage etc. commodity exchanges - price discovery and risk management in commodity markets - Regulatory mechanism of futures trading.

Lag operators and difference equations; stationary and stochastic processes; UNIT roots and cointegration; conditional heteroscedasticity: ARCH and GARCH models - forecast evaluation; methods of forecasting. price indices and econometric estimation and simulation.

Practical

Estimation of demand / supply forecasting, supply chain / value chain analysis for different commodities - Commodity models - multi market estimation - time series analysis - market integration studies - price discovery price volatility estimation - commodity price forecasting using econometric softwares.

Suggested Readings

- Ferris JN. 1998. *Agricultural Prices and Commodity Market Analysis*. McGraw-Hill.
 Goodwin JW. 1994. *Agricultural Price Analysis and Forecasting*. Wiley.
 Hallam D. 1990. *Econometric Modeling of Agricultural Commodity Markets*. New Routledge.
 Martimort D. (Ed.). 1996. *Agricultural Markets: Mechanisms, Failures and Regulations*. Elsevier.
 Schrimper RA. 2001. *Economics of Agricultural Markets*. Pearson.
 Timmer CP. 1986. *Getting Prices Right*. Cornell University Press.
 Tomek WG & Robinson KL. 2003. *Agricultural Product Prices*. 4th Ed. Cornell University Press.

AEC - 607 COMMODITY FUTURES TRADING 2 (2 + 0)

Objective

This course is aimed at providing the basic understanding and the mechanics and value of futures markets for speculators and hedgers which in turn will serve as price risk management activities of agribusiness firms.

Theory

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.

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

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

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

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 Readings

Kaufman PJ. 1986. *The Concise Handbook of Futures Markets*. John Wiley & Sons.

Leuthold RM, Junkus JC & Cordier JE. 1989. *The Theory and Practice of Futures Markets*. Lexington Books.

Lofton T. 1993. *Getting Started in Futures*. 3rd Ed. John Wiley & Sons.

Purcell WD. 1991. *Agricultural Futures and Options: Principles and Strategies*. Macmillan Publ.

Wasendorf RR & McCafferty. 1993. *All about Commodities from the Inside Out*. McGraw-Hill.

AEC - 608 NATURAL RESOURCE MANAGEMENT 2 (1 + 1)

Objectives

This is an applied economics course that focuses on the economic analysis of natural resources, and seeks to identify and solve natural resource management problems via mathematical approach using dynamic optimization techniques. During the course, we will encounter bio-economic models of natural resources including the classic and more recent forestry and fisheries models, models of land and water use and extraction of non-renewable resources (such as from a mineral deposit). We will focus on intuition and understanding of the economic analysis rather than complicated mathematical models in this class. That said, natural resource problems are inherently dynamic, so some mathematical modeling of biophysical and economic processes will be required. Using computers as an aid to understanding the models will be an important part of the class. The primary tool will be Microsoft Excel, which is the easiest introduction to computational optimization and graphical representation of the results.

Theory

Natural resources - definition - characteristics and classification. Stock dynamics of renewable and non-renewable resources. Equation of motion for renewable and non-renewable resources. Fundamental equation of renewable resources.

Growth curves of fishery and forest resources. The role of time preference in natural resource use. Simple two-period model of optimal use of renewable and non-renewable resources. Advanced models of optimal resource use - Static vs. dynamic efficiency in natural resource use Applications of dynamic programming and optimal control.

Economics of groundwater use - optimal extraction of groundwater. Analytical and numerical solutions for optimal inter-temporal allocation of natural resources. Optimal harvesting of single rotation and multiple rotation forests. Optimal management of fishery.

Property rights in natural resources and their implication for conservation and management of natural resources. Management of common property natural resources - Institutional arrangements for conservation and management of common pool fishery, groundwater and forestry resource.

Resource scarcity - Natural resource degradation - Poverty and resource degradation - Natural resource accounting - Pricing and valuation of natural resources - Natural resources policy.

Practical

Derivation of the fundamental equation of renewable resources - Estimation of growth curves and stock dynamics for fishery and forestry resources. Simple two period problem of optimal resource use - Numerical solution for simple two period model of dynamic efficiency in natural resource extraction. Multi-period dynamic efficiency - Using Excel Solver in solving dynamic natural resource harvesting problems. Using analytical solution procedures for solving natural resource management problems - Optimal control.

Suggested Readings

Baland J-M & Platteau JP. 1996. *Halting Degradation of Natural Resources: Is There a Role for Rural Communities?* Clarendon Press and FAO.

Carlson GA, Miranowski J & Zilberman D. 1998. *Agricultural and Environmental Resource Economics*. Oxford Univ. Press.

Chiang AC. 1992. *Elements of Dynamic Optimization*. Waveland Press.

Clark CW. 1976. *Mathematical Bioeconomics: The Optimal Management of Renewable Resources*. John Wiley and Sons.

Conrad JM & Clark CW. 1997. *Natural Resource Economics: Notes and Problems*. Cambridge Univ. Press.

Conrad JM. 1999. *Resource Economics*. Cambridge University Press.

Fisher AC. 1981. *Resource and Environmental Economics*. Cambridge Univ. Press.

Prato T. 1998. *Natural Resource and Environmental Economics*. Iowa State Univ. Press.

Stern T. 2003. *Policy Instruments for Environmental and Natural Resource Management*. Resources for the Future, Washington DC.

AEC - 609 ENVIRONMENTAL ECONOMICS 3 (2 + 1)

Objective

The main objective of this course is to provide an advanced treatment of the economic theory of environmental management and policy, externalities and market and non-market approaches to environmental improvement. Topics in economic growth and environmental problems, poverty and environmental degradation, conservation and sustainable economic growth, intergenerational and global environmental problems, policy issues in environmental regulation and management will be covered at a sufficient depth so as to equip the students with the recent developments in the field.

Theory

Environmental pollution as a consequence of market failure - Causes and consequences of market failure - Externalities - Public goods and externalities - Economics of pollution - Private vs. Social cost of environmental pollution - Property rights, environment and development - Theory of environmental policy.

Environmental cost benefit analysis - Environmental impact assessment techniques - Non-market valuation of environmental resources (WTP / WTA) - Environment, market and social welfare.

Economic growth and environmental cost - Growth oriented economic policies and their environmental impacts - Population and environmental quality - poverty and environmental degradation - Sustainable development - Indicators of sustainable development - Issues in sustainable development.

Environment, ecology and environmental accounting - Environmental pollution with respect to water and air - Land and forest resources related environmental pollution - Coastal externalities - Urbanization and environment - Basic approaches to environmental policy (Tax, subsidy, pollution permits etc.) Green taxes - Political economy of environmental regulation and management.

Transboundary environmental problems - Economics of global warming, climate change and emission trading - Environment, international trade and development.

Practical

Contemporary global environmental global environmental issues, movement, policies, programmes, laws and other regulatory mechanisms - Criteria for evaluating the environment related projects and review of Environmental Impact Assessment (EIA) techniques - Recreation demand models of environmental valuation - Contingent valuation techniques - Environmental Resource Accounting Techniques - Discussion on the techniques dealing with air pollution and review of case studies on air pollution and its impacts - forest environment and wild life conservation - Green GDP and Green house insurance - Practical considerations and comparison of instruments of environmental policy - Non-point source pollution control methodologies - Environment in macroeconomic modeling - Meta-analysis, economic valuation and environmental economics - Multi-criteria methods for quantitative, qualitative and fuzzy evaluation problems related to environment - Input output analysis, technology and the environment - Computable general equilibrium models for environmental economics and policy analysis.

Suggested Readings

Carlson GA, Miranowski J & Zilberman D. 1998. *Agricultural and Environmental Resource Economics*. Oxford Univ. Press.
 Hanley N, Shogren J & White B. 2007. *Environmental Economics in Theory and Practice*. Palgrave, London.
 Kolstad C. 1999. *Environmental Economics*. Oxford Univ. Press.
 Prato T. 1998. *Natural Resource and Environmental Economics*. Iowa State Univ. Press.
 Sterner T. 2003. *Policy Instruments for Environmental and Natural Resource Management. Resources for the Future*. The World Bank and SIDA.

AGRICULTURAL ECONOMICS

List of Journals

- Agricultural Economics Research Review
- Agricultural Finance Review
- Agricultural Marketing
- Agriculture and Agro-industries Journal
- Agriculture Statistics at a Glance
- APEDA Trade yearbook
- Asian Economic and Social Review (Old Series)
- Bulletin of Agricultural Prices
- Economic and Political Weekly
- Economic Survey of Asia and Far East
- FAO Commodity Review and Outlook
- FAO Production Year book
- FAO Trade year book
- Indian Cooperative Review
- Indian Economic Journal
- Indian Journal of Agricultural Economics
- Indian Journal of Agricultural Marketing
- Indian Journal of Economics
- International Food Policy Research Institute Research Report
- Journal of Agricultural Development and Policy
- Journal of Agricultural Economics
- Journal of Agricultural Economics and Development

- Journal of Farm Economics
- Land Economics
- Productivity
- Reserve Bank of India Bulletin
- Rural Economics and Management
- World Agricultural Economics and Rural Sociology Abstracts
- World Agricultural Production and Trade: Statistical Report
- Yojana
- Agricultural Situation in India

e- Resources

- www.pearsoned.com (Pearson Education Publication)
 - www.mcgraw-hill.com (McGraw-Hill Publishing Company)
 - www.oup.com (Oxford University Press)
 - www.emeraldinsight.com (Emerald Group Publishing)
 - www.sagepub.com (Sage publications)
 - www.isaeindia.org (Indian Society of Agricultural Economics)
 - www.macmillanindia.com (Macmillan Publishing)
 - www.icar.org.in (Indian Council of Agricultural Research)
 - www.khoj.com (Directory for Agricultural Economics)
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- www.ncap.res.in (National Centre for Agricultural Economics and Policy Research)
 - www.ncdex.com (National Commodity & Derivatives Exchange Limited)
 - www.phdcci.in (PHD Chamber of Commerce and Industry)
 - www.ficci.com (Federation of Indian Chambers of Commerce and Industry)
 - www.assochem.org (Associated Chambers of Commerce and Industry of India)
 - www.apeda.com (Agricultural and Processed Food Products Export Development Authority)
 - www.mpeda.com (Marine Products Export Development Authority)

Suggested Broad Topics for Master's and Doctoral Research

- Economics of Irrigation water in different agro-climatic conditions
- Potential of exports of agri-products
- Potential domestic as well as international markets for value added agri-products
- Demand & supply gap of different agri-products and agri-inputs
- Economic analysis of new agri-technologies
- Input use efficiency in different agro-climatic conditions
- Income and expenditure pattern in rural areas
- Saving and investment pattern in rural areas
- Return from investment in agriculture research
- Marketing of agri-products in WTO regime
- Impact of WTO on agricultural economy
- Impact of Agricultural credit on socio-economic condition of the farmers
- Optimization of production process to reduce the cost of production
- Economic analysis of diversification, processing and value addition in agriculture sector
- Emerging international marketing scenario of agri-products
- Extent of farmers' indebtedness in different agro-climatic conditions

COMPULSORY NON-CREDIT COURSES

(Compulsory for Master's programme in all disciplines; Optional for Ph.D. scholars)

CODE COURSE TITLE CREDITS (6 Credits to be offered):

PGS - 501: LIBRARY AND INFORMATION SERVICES 1 (0 + 1)

PGS - 502: TECHNICAL WRITING AND COMMUNICATIONS SKILLS 1 (0+1)

PGS - 503: INTELLECTUAL PROPERTY AND ITS MANAGEMENT IN AGRICULTURE (e-Course) 1 (1 + 0)

PGS - 504: BASIC CONCEPTS IN LABORATORY TECHNIQUES 1 (0 + 1)

PGS - 505: AGRICULTURAL RESEARCH, RESEARCH ETHICS AND RURAL DEVELOPMENT PROGRAMMES (e-Course) 1 (1 + 0)

PGS - 506: DISASTER MANAGEMENT(e-Course) 1 (1 + 0)