Ph.D Programme

Course No.	*Title of the Course*	*Credits*
	1st Semester	
AG ECON 701	Advanced Microeconomic Analysis	1+1
AG ECON 702	Commodity Future Trading	2+0
AG ECON 703	Natural Resource Management	1+1
AG ECON 704	Advanced Macroeconomic Analysis	2+0
	2nd Semester	
AG ECON 751	Advanced Production Economics	1+1
AG ECON 752	Advanced Agricultural Marketing and Price Analysis	1+1
AG ECON 799	Seminar I	1+0
	3rd Semester	
AG ECON 801	Quality Development Policy	1+1
AG ECON 802	Advanced Econometrics	
AG ECON 849	Seminar II	1+0
	4th Semester	
	Nil	
	5th Semester	
	Nil	
	6th Semester	
AGECON 999	Seminar III	1+0
AGECON 1000	Doctoral Research	0+45

AG ECON 701 Advanced Micro Economic Analysis 1+1

Theory
UNIT I :

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.

UNIT II:

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

UNIT III:

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.

UNIT IV :

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

UNIT V:

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.

AG ECON 702 Commodity Futures Trading 2+0

Theory
UNIT I:

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.

UNIT II :

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

UNIT III :

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

UNIT IV :

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

UNIT V :

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.

AG ECON 703 Natural Resources Management 1+1

UNIT I :

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.

UNIT II :

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.

UNIT III :

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.

UNIT IV:

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.

UNIT V :

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.

AG ECON 704 Advanced Macroeconomic Analysis 2+0

Theory

UNIT I :

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

UNIT II :

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

UNIT III :

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

UNIT IV:

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

UNIT V :

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.

AG ECON 751 Advanced Production Economics 2+1

Theory
UNIT I:

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

UNIT II :

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.

UNIT III:

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 .

UNIT IV :

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.

UNIT V:

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.

AG ECON 752 Advanced Agricultural Marketing and Price Analysis 1+1

Theory

UNIT I :

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.

UNIT II:

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

UNIT III: 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.

UNIT IV: 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.

UNIT V: 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 soft wares.

AG ECON 801 Quantitative Development Policy Analysis 1+1

Theory
UNIT I:

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.

UNIT II:

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.

UNIT III:

Household behaviour and policy analysis – Household models. UNIT IV

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.

UNIT V:

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.

AG ECON 802 Advanced Econometrics 2+1

Theory

UNIT I :

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

UNIT II:

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.

UNIT III:

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

UNIT IV:

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

UNIT V:

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