

# COLLEGE OF AGRICULTURE, DAPOLI

## DEPARTMENT OF AGRICULTURAL ECONOMICS

### 1. Name of the Department/Section : DEPARTMENT OF AGRICULTURAL ECONOMICS

Department of Agricultural Economics since its inception in the year 1972 have contributed for research on various economic and social aspects of Agricultural crops and allied enterprises, land dynamics, temporal and structural changes, co-operatives, finance in agriculture.

Name of the College / Department	College of Agriculture, Dapoli Department of Agriculture Economic, Dapoli
Year of Establishment	1973-74
Intake Capacity	Under Graduate - 146 (128+13*+5**) *10% ICAR seats over and above of intake Post Graduate - 8+ 1 CAR Seats Doctoral Degree - 2+ 1 CAR Seats
Contact Details E mail	9422822282, 7588225522 hodecon@dbskkv.ac.in hodecon@rediffmail.com

### 2. About Department :-

#### Mission, Goal and objectives

##### Mission:

“To cater the need of the Konkan region with regards to Education, research and Extension Education in Agriculture.”

##### Goal :

- 1) To provide education in agriculture economics by integrating and coordinating teaching in different faculties and examine the students.
- 2) To provide research base to improve the productivity of agriculture, horticulture, livestock, fisheries and agri-allied activities in Konkan region through basic, applied, adoptive and need based research for attaining economic growth and self-sufficiency of the State.
- 3) To undertake and guide extension education programmes including first line transfer of technology, extend technological services for training, conduct demonstrations and develop appropriate communication network.
- 4) To standardize technologies for crop production, protection, harvesting, marketing, post harvest utilization and also for livestock, poultry and fisheries for improving the standard of living of the farmers, farm workers and women of Konkan in general and rural women in particular.

##### Objectives :

- ❖ Imparting teaching in Agril. Economics and Statistics at Under graduate & Post graduate level.
- ❖ Conducting research in Agril. Marketing, Agri. Business Activities and Agricultural Development.
- ❖ Participation in extension activities in transfer of technologies and their impact evaluation.

## Academic and Office Staff

**Table : Faculty position**

Sr. No.	Post	No. of Sanctioned Post	Filled In	Vacant Position
	Head Quarter			
1.	Head	1	1	--
2.	Professor	1	--	1
3.	Associate Professor	2	2	--
4.	Assistant Professor	4	2	2
5.	Assistant Professor (Stat.)	1	1	--
	Pooled Services from Research Station			
6.	Associate Professor (Agril. Economists, RFRS, Vengurle and RARS, Karjat)	2	2	--
7.	Assistant Professor (Assistant Statistician, RARS, Karjat)	1	1	--
	Cost of Cultivation Scheme, Government of Maharashtra			
8.	Field officer (Assistant Professor)	1	--	1
9.	Sr. Research Assistant	1	1	--
10.	Jr. Research Assistant	5	5	--
11.	Field Assistant at Cluster level	13	12	1
12.	Sr. Clerk	1	1	--
13.	Jr. Clerk	1	--	1
	Other Supporting Staff (Head Quarter)			
14.	Agril. Assistant	1	1	--
15.	Peon/Lab Boy	2	1	1
16.	Labour	2	2	--

\*One SRA from Cost of Cultivation holding additional charge as Assistant Professor

### Staff involved in teaching, research and extension

Name	Designation	Qualification	Specialization	Date of Joining in service
Dr. S. R. Torane	Professor (CAS) Dy. D.D.R.(Econ.)	Ph. D. UAS, Dharwad	Production Economics	03/06/1999
Dr. V. G. Naik	Professor (CAS)	Ph. D. Dr. BSKKV, Dapoli	Farm Management & Agril. Marketing	26/11/1992
Mrs. S. M. Kulkarni	Associate Professor (CAS)	M. Sc. Statistics	Statistics	08/03/1990
Dr. P. J. Kshirsagar	Assistant Professor	Ph. D. UAS, Dharwad	Production Economics	19/10/1993
Dr. D. B. Malave	Assistant Professor	Ph. D. MPUAT, Udaipur	Agricultural Marketing	24/03/1999
Dr. S.S. Bhosale	Field Officer	Ph. D. MPUAT, Udaipur	Agril.Cooperation and Finance	03/11/1989
Dr. S.R. Bagade	Sr. Research Assistant (Additional Charge of Assistant Professor)	Ph. D. Dr. BSKKV, Dapoli	Production Economics	12/06/2008

### 3. Academic programmes :-

#### a. Doctoral Programmes

##### Name of the programme:

Semester No.	Term No.	Course No.	Credits	Title of the course offered by the department
I	I	AEC-601*	2(1+1)	Advanced Micro Economic Analysis
I	I	AEC-602*	2(2+0)	Advanced Macro Economic Analysis
III	I	AEC-603*	3(2+1)	Advanced Econometrics
II	II	AEC-604*	3(2+1)	Advanced Production Economics
II	II	Common*	2(2+0)	Research and Publication Ethics
IV	II	AEC-660*	1(1+0)	Doctoral Seminar-I
V	I	AEC-661*	1(1+0)	Doctoral Seminar-II
		<b>Total</b>	<b>11+03 =14</b>	
		AEC 699*	0+75	Doctoral Research

##### \*Compulsory Courses

Common\* Student may choose course from Agronomy or Agricultural Meteorology

##### Minor Courses:

Course code	Semester	Course Title	Credits
AEC-606	II	Advanced Agricultural Marketing and Price Analysis	3(2+1)
AEC-607	III	Quantitative Development Policy Analysis	2(1+1)
AEC-608	II	Natural Resource Management	3(2+1)
AEC-609	III	Environmental Economics	3(2+1)
<b>Total</b>			<b>07+04=11</b>

##### Minor Disciplines:

1. Agricultural Extension Education
2. Agronomy
3. Horticulture
4. Animal Husbandry and Dairy Science
5. Agri. Business Management

#### Course Curricula and syllabi:

<b>AEC-601</b>	<b>Advanced Micro Economic Analysis</b>	<b>1+1</b>
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##### Why this course?

This course is required to up scale the knowledge of students about microeconomics. So that they can get a deeper and better understanding of the subject

##### Aim of the course

To gain fundamental understanding of consumer behavior, producer's strategy, market structure through which transactions take place and human and firms interact. Develop foundation of scarce resource allocation for optimum results.

##### Organization of the course

The course is organized as follows–

No Block	Unit
1. Consumer Theory	1. Consumer Theory

- |                                   |                        |
|-----------------------------------|------------------------|
| 2. Market and General equilibrium | 1. Market              |
|                                   | 2. General Equilibrium |
| 3. Market failure and welfare     | 1. Market Failure      |
|                                   | 2. Welfare Economics   |
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## Theory

### Block 1- Consumer Theory

#### Unit 1: Consumer Theory

Theory of consumer behavior – 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.

### Block 2- Market and General Equilibrium

#### Unit 1: Market

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

#### Unit 2: General Equilibrium

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.

### Block 3- Market Failure and Welfare

#### Unit 1: Market failure

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 2: Welfare Economics

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.

AEC-602	Advanced Macro Economic Analysis	2+0
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## Why this course?

A deeper understanding of the conceptual and structural framework is imperative to develop vision of a student about how the knowledge of various macroeconomic models is applied in real economy.

## Aim of the course

To understand the functioning of national economy, its history and models. The policies governing the modern

economic system and concerned institutions.

**Organization of the course**

The course is organized as follows–

<b>No Block</b>		<b>Unit</b>	
1.	Introduction	1.	Overview
2.	Economic Models	1.	Open Economy Models
		2.	Dynamic Macroeconomic Models
3.	Business cycle and policies	1.	Business Cycles
		2.	Macroeconomic Policies

**Theory**

**Block 1- Introduction**

**Unit 1: Overview**

Conceptual framework - Classical, Keynesian, Neo-Classical, and Neo-Keynesian macroeconomics; Review of Keynes-Classical Synthesis; Aggregate Demand and Supply in the closed economy with fixed and variable price level- determination of wage, prices, output and employment

**Block 2- Economic Models**

**Unit 1: Open Economy Models**

Exchange rate determination; purchasing power parity; asset market approach; Short-run open economy models; Mundell-Fleming model- exchange rate regime: perfect capital mobility under fixed and flexible exchange rate; effectiveness of fiscal policy and monetary policy; Dornbusch’s overshooting model; monetary approach to balance of payments; international financial markets

**Unit 2: Dynamic Macroeconomic Models**

Introduction to dynamic macroeconomic Models; Dynamic aggregate demand and supply–short and long term equilibrium-rational expectations approach

**Block 3: Business Cycle and Policies**

**Unit 1: Business Cycles**

Business cycle and its alternative equilibrium model, Stability analysis Economics of Great Events-Depression, Hyperinflation and Deficits; Advances in Business Cycle Theory; Real Business Cycles & Neo-Keynesian Economics

**Unit 2: Macroeconomic Polices**

Monetary policy - Design of Monetary Policy; Inflation Targeting, Fiscal Policy - Government Budget Constraint: The Arithmetic of Deficits and Debt, Current versus Future Taxes, the Evolution of Debt-to-GDP Ratio; Public Borrowing-Internal and external aid, Deficit financing, Development Financing; BOP & Adjustment Policies- Foreign Exchange Policy -International macro-economic policies, IMF, IBRD, UNCTAD.

<b>AEC-603</b>	<b>Advanced Econometrics</b>	<b>2+1</b>
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**Why this course?**

The heart of any research is carrying out the analysis with the most appropriate model. The results obtained are crucial for the researchers. Thus, this course acts as the centre point of building up analytical framework of research. The students need to learn building up of models that will be used to test the hypothesis framed. Use different analysis depending upon the requirement and type of data.

**Aim of the course**

The course aims at providing the knowledge and command over analysis of data collected to get the

desired result. Train the student in use of econometric models.

**Organization of the course**

**The course is organized as follows:**

No Block	Unit
1. Concepts	1. Review
2. Least squares and dummy variables	1. Concept of Least Squares 2. Dummy Variable
3. Econometric models	1. Models and their extensions 2. Simultaneous equation models

**Theory**

**Block 1: Concepts**

**Unit 1: Review**

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

**Block 2: Least Squares and Dummy Variables**

**Unit 1: Concept of least squares**

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 2: Dummy Variable**

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

**Block 3: Econometric Models**

**Unit1: Models and their extensions**

Autoregressive distributed lag models–panel data fixed and random effects models and their extensions. Analysis of time series – stationarity and unit root test, ARIMA, ARCH group of models and co-integration.

**Unit 2: Simultaneous equation models**

Simultaneous equation systems: Basic rationale, identification problems, Single equation methods of estimation-indirect least squares, two stage least squares. Limited information maximum likelihood, three-stage least squares, and full information maximum likelihood; Relative merits of these methods and their small and large sample properties. SURE estimates.

**Practical**

Estimation of multiple regression model - GLS estimation methods - testing misspecification errors estimating 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-unit root tests for stationarity, fitting of ARIMA and ARCH group of models –co integration.

<b>AEC-604</b>	<b>Advanced Production Economics</b>	<b>2+1</b>
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**Why this course?**

There is requirement of getting acquainted with decision making process in case of factors and products. The researcher needs to understand about working on production process and workout suitable suggestions to improve it.

**Aim of the course**

The course deals with the concept of advanced production economics. The exposition would be

mathematically oriented. The course would also cover the analysis of production functions, its interpretation, decision making with multiple input use, factor sharing and decision making under risk and uncertainty.

**Organization of the course**

The course is organized as follows:

No Block	Unit
1. Consumer Theory	1. Production Process
2. Market and General equilibrium	1. Production Functions and characteristics
3. Market failure and welfare	1. Decision Making in Production
	2. Technology, Efficiency and Risk Management
	3. Programming

**Theory Syllabus:**

**Block 1: Production Process**

**UNIT I: Production Process:**

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

**Block 2: Production Function:**

**UNITI: Production Function and characteristics:**

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.

**Block 3: Dynamics of Production process**

**UNITI: Decision making in Production**

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.

**UNIT2: Technology and Risk**

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.

**UNIT3: Programming**

Simulation and programming techniques in agricultural production, -Multiple Objective Programming (MOP), Goal programming Weighted sum and Compromise programming –applications.

**Practical Syllabus:**

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.

<b>AEC-605</b>	<b>Operations Research</b>	<b>2+1</b>
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**Why this course?**

In sphere of management it is important, to take correct decision of assigning tasks and roles to individuals. The business is full of uncertainty and in this situation the manager has to take decision. It becomes imperative to gain knowledge of models used for finding this solution of performing well.

**Aim of the course**

To gain elementary knowledge of solving problems and decision making for managing farming and organization in resource constraint in order to achieve the objective.

**Organization of the course**

The course is organized as follows–

No Block	Unit
1. Concepts	1. Concepts
2. Inventory and models	1. Inventory- A Review 2. Models
3. Decision making	1. Decision making 2. Game theory

**Theory**

**Block 1: Concepts**

**Unit 1: Concepts**

Elementary concepts and objectives of Operations Research, Review of Linear programming - Assumptions & Methods, Non-linear programming problem – Quadratic programming, Multi Objective Programming(MOP)

**Block 2: Inventory and Models**

**Unit 1: Inventory- A Review**

Inventory control models, costs involved in Inventory management, types of inventory, Economic order quantity model, Waiting line models: Waiting line problem, Characteristics of a waiting line system, Single channel model,

**Unit 2: Models**

Markov Chains, Sequencing, Replacement models, Transportation and Assignment problems.

**Block 3: Decision Making**

**Unit 1: Decision Making**

Decision making under risk and uncertainties, decision problem, maximax criterion, maximin criterion, minimax regret criterion, Laplace criterion, Pay off tables, Decision trees, Expected value of perfect information.

**Unit 2: Game Theory**

Game Theory – Two-person Zero sum game, Simulation, Network Analysis- PERT&CPM.

**Practical**

- Linear and Non-linear programming problem,
- Quadraticprogramming,Multi-ObjectiveProgramming-GoalProgramming,



- Lexicographic, Weighted Sum, Determining economic order quantity, reorder level of EOQ model.
- Waiting line problem, Problems on Markov Chains, Sequencing and Replacement models.
- Formulating and solving transportation type problems, Assignment problems as a special type of transportation problem.
- Solving deterministic and probabilistic queuing models Structuring and solving decision trees for optimal decisions Game theory, Simulation, Developing network (PERT/CPM) diagrams and determining the critical path.

<b>AEC-606</b>	<b>Advanced Agricultural Marketing and Price Analysis</b>	<b>2+1</b>
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**Why this course?**

Efficient markets, connectivity in markets, facilities of transport and storage ensure that there is growth in marketing of the produce as well as the industries based on those produce. The decision of selling the produce at the right time, and at a higher price is crucial to ensure remunerative returns to the farmer. Thus, this course is required to enhance the knowledge to students in agricultural markets and price analysis.

**Aim of the course**

To impart adequate knowledge and analytical skills in the field of agricultural marketing and enhance expertise in improving the performance of the marketing institutions and the players in marketing of agricultural commodities. Learning outcome: After successful completion of this course, the student will be able to-Gain the knowledge of marketing and agricultural prices. Work out the interaction between different markets and analyse their working. Gain expertise in forecasting of price and buildup market intelligence.

**Organization of the course**

The course is organized as follows-

No Block	Unit
1. Concepts	1. Agricultural Marketing-Insights
2. Marketing Institutions and Dynamics	1. Institutions and their functions
	2. Market Dynamics
3. Techniques	1. Commodity marketing
	2. Models for Analysis

**Theory Syllabus :**

**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 - software’s 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**

Multimarket 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; roots and co integration;

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- multimarket estimation-time series analysis- market integration studies- price discovery price volatility estimation-commodity price forecasting using econometric softwares.

<b>AEC-607</b>	<b>Quantitative Development Policy Analysis</b>	<b>1+1</b>
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**Why this course?**

Policy reforms are inevitable. They are continuously required to deal with the loop holes of previous policy and control the present situation in a better manner. Reforms take place in both microeconomic and macroeconomic policies. The analysis of these policies help us to develop a framework for designing and implementing the policies.

**Aim of the course**

To develop expertise in understanding the rationale behind development of policies. Conceptualization of equilibrium and working out the economic implications of development policy. Learning outcome: After the completion of the course, the student will be able to-Conceptualize policy framework. Get acquainted with analysing the policy and workout corrective solutions.

**Organization of the course**

The course is organized as follows

No Block	Unit
1. Concepts	1. Policy Framework
2. Demand-supply and household	1. Demand-Supply Analysis behaviour 2. Household Behaviour and models
3. Approaches to review policy and welfare	1. Multi-Pronged approach to policy review  2.General equilibrium and programming

**Theory**

**Block 1: Concepts**

**Unit 1: Policy Framework**

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.

**Block 2: Demand-supply and household behaviour**

**Unit 1: Demand-Supply 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.

**Unit 2: Household Behaviour and models**

Household behaviour and policy analysis – Household models.

**Block 3: Approaches to review policy and welfare**

**Unit 1: Multi-Pronged approach to policy review**

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

**Unit 2: General equilibrium and programming**

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

**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.

<b>AEC-608</b>	<b>Natural Resource Management</b>	<b>2+1</b>
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**Why this course?**

The environment envisages the whole living creatures’ within it. There are resources we obtain from the nature and at the same time spoil the environment by exploiting the resources. Thus, it is necessary for the student to develop environment friendly plans to utilize the scarce resources.

**Aim of the course**

Concept building on natural resources. Gaining expertise in economic aspect of Natural resources and maintain a balance between economic gains and environment conservation. Learning outcome-After the completion of the course, the student will be able to-Understand the natural resources and methodologies to develop plans for their optimal use. Work out the economics of forest, fisheries and ground water. Be able to deal with the legal matters of the natural resources.

**Organization of the course**

The course is organized as follows:

No Block	Unit
1. Concepts	1. Concepts
2. Models and Management	1. Models for economic view of natural resources 2. Management of water resources
3. Regulations and planning	1. Property Rights 2. Dynamics of resource economics

**Theory Syllabus**

**Block 1: Concept**

**UNIT I: Concept:**

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.

**Block 2: Models and Management:**

**UNIT I: Models for economic view of natural 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.

**UNITII: Management of water resources:**

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.

**Block 3: Regulations and planning**

**UNITI: Property Rights:**

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.

**UNITII: Dynamics of resource economics**

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

**Practical Syllabus:**

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.

<b>AEC-609</b>	<b>Environmental Economics</b>	<b>2+1</b>
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**Why this course?**

Economics not only deals with transaction taking place between human beings within and across national boundaries. Each economic activity has a price to pay to the environment. The activity causes loss to the environment in various ways. Thus, as a student of economics it is necessary to work out the costs and returns in terms of losses to environment while carrying out these development/production activities.

**Aim of the course**

To understand the economic outcomes of environmental degradation. Make students proficient in decision making regarding environment protection, resource use, and conservation policy.

**Organization of the course**

The course is organized as follows:

<b>No Block</b>	<b>Unit</b>
1. Overview	1. Overview of Environmental Economics
2. Assessment and Development Dynamics	1. Economic assessment 2. Developmental Aspects
3. Regulations and Issues	1. Accounting, Policies and Regulations 2. Environmental Issues

**Theory**

**Block 1: Overview**

**Unit 1: Overview of Environmental Economics**

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.

**Block2: Assessment and Development Dynamics**

**Unit 1: Economic assessment**

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

**Unit 2: Developmental aspects**

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. Sustainable Development Goals.

**Block 3: Regulations and Issues**

**Unit 1: Accounting, Policies and Regulation**

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.

**Unit 2: Environmental Issues**

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 evaluation 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 compares on of instruments of environmental policy
- Non-point source pollution control methodologies
- Environment in macroeconomic modeling
- Meta-analysis, economic evaluation 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.

**b. Masters Programmes**

**Name of the programme:**

Semester No.	Term No.	Course No.	Credits	Title of the course offered by the department
I	1	AEC 501*	3(3+0)	Micro Economic Theory and Applications
II	2	AEC 502*	2(1+1)	Agricultural Production Economics
II	2	AEC 503*	3(2+1)	Agricultural Marketing & Price Analysis

I	1	AEC 504*	2(2+0)	Macro Economics and Policy
II	2	AEC 505*	3(2+1)	Econometrics
II	2	AEC 506	2(2+0)	Agricultural Development and Policy Analysis
I	1	AEC 507*	3(2+1)	Agricultural Finance and Project Management
III	1	AEC 508*	2(1+1)	Linear Programming
I	1	AEC 509*	2(1+1)	Research Methodology for Social Sciences
III	1	AEC 510	2(2+0)	Indian Economy: History and Contemporary Issues
III	1	AEC 511	2(1+1)	International Economics
III	1	AEC 591*	1 (0+1)	Master's Seminar
		Total	19+08=27	
		AEC 599	0+30	Master's Research

### Course Curricula and syllabi:

<b>AEC-501</b>	<b>Micro Economic Theory and Applications</b>	<b>3 + 0</b>
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#### Why this course?

Markets form an integral part of the economy. They are governed by demand and supply mechanism with profit making its ultimate goal. Thus, it is imperative to expose the students towards how the markets function, their types and how the buyers and sellers behave. That will help them make correct decision when it comes to price setting and choice of product.

#### Aim of the course

The course envisages the concepts and principles embodying micro-economics. The economic problems, functioning of price mechanism, theory of household behaviour and consumer's demand function. Theory of firm, supply determinants, determination of price under different market structures and factor pricing (micro economic components).

#### Organisation of the course

The course is organised as follows:

No Block	Unit
1. Introduction to micro-economic	1. Basic Concepts: A review
2. Insight of consumer, production and cost involved	1. Consumer Choice 2. Production and Costs
3. Overview of market	1. Market Forms 2. Factor Markets

#### Theory

##### Block 1: Introduction to micro-economics

##### Unit 1: 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

##### Block 2- Insight of consumer, production and cost involved

##### Unit1: Consumer Choice

Cardinal Utility Approach – Ordinal Utility Approach -Budget sets and Preferences under different situations–Hicks and Slutsky income and substitution effects- 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.

**Unit2: 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.

**Block3: Overview of market**

**Unit1: 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; dead weight 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. Duopoly: Cournot model and reaction curves; Stackelberg’s model, Bertrand model; Oligopoly.

**Unit2: 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.

<b>AEC-502</b>	<b>Agricultural Production Economics</b>	<b>1 + 1</b>
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**Why this course?**

Production in agriculture is the outcome of the input factors involved. In this competitive and uncertain market, it is important that the farmers take the right decision about the combination of inputs that will result in higher income. Thus, as an economist it is a pre-requisite that the students understand the interaction between output and input. And workout the most effective production plan.

**Aim of the course**

To expose the students to develop the concept, significance and uses of production economics. To understand the relationships between factors and output. To learn how to decide the combination of inputs to be used as per the resources available. Ensure that the production process works efficiently.

**Organization of the course**

The course is organized as follows-

No Block	Unit
1. Introduction to production economics	1. Concepts of production economics
2. Factors and costs	1. Factors and theory of production 2. Concepts of costs
3. Assessment	1. Dynamics of assessment

**Theory :**

**UNIT I**

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.

## UNIT II

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.

## UNIT III

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.

## UNIT IV

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.
- Scale of production
- Trend and growth analysis

**AEC-503**

**Agricultural Marketing and Price Analysis**

**2 + 1**

### Why this course?

The ultimate aim of production process is to sell the produce in the market and generate income. A market serves as platform where this exchange takes place. Agriculture markets are different from other markets due to the nature of the commodity. Thus, it is important to develop a strong foundation of agricultural marketing, its components and issues. The student needs to know about the multi- pronged ways of marketing the produce, agencies involved. In this modern era, it is important to understand how technology is transforming this sector.

### Aim of the course

The course is designed to acquaint the students about the basics of dynamics of agricultural marketing. The content includes supply, demand and marketing of farm production, marketing functions and channels, marketing costs, margins and efficiency, agricultural prices, New marketing formats like e-marketing, e-NAM future trading, supply chain management, market intelligence etc.

### Organization of the course

The course is organized as follows:

No Block	Unit
1. Introduction to agricultural marketing	1. Introduction to agricultural marketing
2. Agricultural markets	1. Aspects of agricultural marketing 2. Future marketing and government
3. Advances in agricultural marketing	1. Use of information technology 2. Dynamics of price



## **Theory**

### **Block1: Introduction to Agricultural Marketing**

#### **Unit 1: Introduction to Agricultural Marketing**

New Concepts in Agricultural Marketing - Characteristic of Agricultural product and Production – Problems in Agricultural Marketing from Demand and Supply and Institutions sides. Market intermediaries and their role - Need for regulation in the present context - Marketable & Marketed surplus estimation. Marketing Efficiency- Vertical and Horizontal integration- Structure Conduct and Performance analysis – Integration over space, time and form- Vertical co-ordination.

### **Block 2: Agricultural Markets**

#### **Unit 1: Aspects of agricultural marketing**

Different Forms of marketing: Co-operatives Marketing – APMC Regulated Marketing- Direct marketing, Farmer Producer Companies, e-NAM and marketing under e-NAM, e-marketing Contract farming and Retailing, Organized retailing - Supply Chain Management - State trading, Warehousing and other Government agencies -Performance and Strategies -Market infrastructure needs, performance and Government role- Value Chain Finance.

#### **Unit 2: Future marketing and government**

History and introduction to Commodities markets and future trading –Terms used in future trading-Basics of commodity futures - Operation Mechanism of Commodity markets – Price discovery – Speculation and Hedging -Basis Fundamental analysis - Technical Analysis –Role of Commodity exchanges in India- (MCX, NCDEX etc.). Role of Government/SEBI in promoting commodity trading and regulatory measures.

### **Block 3: Advances in Agricultural Marketing**

#### **Unit 1: Use of Information Technology**

Role of Information Technology and Market Intelligence in marketing of agricultural commodities, electronic auctions (e-bay), e-Chaupals, Agmarknet and Domestic and Export market Intelligence Cell (DEMIC).

#### **Unit 2: Dynamics of price**

Price forecasting – time series analysis – time series models – spectral analysis. Price policy and economic development–non-price instruments- Emerging problems in Agricultural Marketing, New policy for Agricultural Marketing.

## **Practical**

- Supply and demand elasticities in relation to problems in agricultural marketing.
- Price spread and marketing efficiency analysis.
- Marketing structure analysis through concentration ratios.
- Performance analysis of Regulated market and marketing societies. Analysis on contract farming and supply chain management of different agricultural commodities, milk and poultry products.
- Supply Chain Analysis-quantitative estimation of supply chain efficiency.
- Market Intelligence–Characters, Accessibility, and Availability Price forecasting.
- Online searches for market information sources and interpretation of market intelligence reports – commodity outlook.
- Technical Analysis for important agricultural commodities.
- Fundamental Analysis for important agricultural commodities.
- Presentation of the survey results and wrap-up discussion-
- Computation of indices

**Theory**

**BLOCK 1: Conceptualizing Macro Economics**

**UNITI: Introduction: Measurement and Concepts**

Basic concept and Scope of Macro Economics, National Income, Accounting methods of measurement of key macroeconomics aggregates, relationship of national income and other aggregates (with numerical exercises), Real and Nominal income.

**BLOCK 2: Theories of Macroeconomics**

**UNIT I: Classical Macroeconomics**

Classical postulates, Say's Law, classical theory of employment, aggregate labour supply and demand of labour, classical theory of determining output, wages and prices.

**UNITII: Income and Spending: Keynesian Framework**

Simple Keynesian model of income determination; Keynesian multiplier- aggregate spending, taxation, transfer payment, foreign spending, balance budget; budget surplus (with numerical exercises) Concepts of Accelerator and its working

**BLOCK 3: Money, Consumption and Inflation**

**UNIT I: 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.

**UNITII: Theories of Aggregate Consumption and Investment**

Consumption function and its technical attributes, Investment, its type, factor influencing investment, fiscal and monetary factors. Absolute income hypothesis, Relative income hypothesis, Fishers Inter - temporal choice model, Life- cycle and Permanent Income hypothesis; profit and accelerator theory.

**UNITIII: Inflation and Unemployment.**

Inflation: Nature, Effects and control. Type of inflation- Demand pull, Cost push,. Stagflation, core inflation, hyperinflation; Phillips curve. Business cycles, Unemployment- type of unemployment.

**Why this course?**

Development of analytical skills is imperative to make students proficient in conducting quality research work. The knowledge of variables, their models, and problems encountered when dealing with variables will build up a compatibility with the analytical aspects.

**Aim of the course**

The course provides knowledge of the econometric methods like time series analysis, linear regression models and their application in economic analysis. The course provides an insight into the econometric problems in analyzing time series and cross section data.

**Organization of the course**

The course is organized as follows:

No Block	Unit
1. Introduction to econometrics	1. Introduction
2. Classical Regression	1. Classical Linear Regression 2. Breaking down of Classical assumptions
3. Qualitative Variables	1. Qualitative variables and simultaneous Equation models

## Theory

### Block 1: Introduction to Econometrics

#### Unit1: Introduction

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

### Block 2: Classical Regression

#### Unit 1: Classical Linear Regression

Basic two variable regressions-Population regression function, Simple regression function, The method of ordinary least squares, Assumption of classical linear regression model, Estimation, properties of least-squares estimators (The Gauss-Markov theorem), standard error of least squares estimates, measures of goodness of fit (The coefficient of determination  $r^2$ ) and Interpretation. Functional forms of regression model. Approaches to estimation-OLS and their properties. Extensions to multi-variable models-multiple regression-estimation and interpretation.

#### Unit 2: Breaking down of Classical assumptions

Violation of assumptions - identification, consequences and remedies for Multicollinearity, heteroscedasticity, autocorrelation - data problems and remedial approaches - model misspecification and diagnostic testing.

### Block 3: Qualitative Variables

#### Unit 1: Qualitative variables and simultaneous equation models

Nature of qualitative response model, Nature of dummy variable, Caution in the use of dummy variable, Use of dummy variables- Introduction to simultaneous equations- identification problem

### Practical

- Single equation two variable model specification and estimation
- Hypothesis testing and OLS application
- Estimation of multiple regression model
- Testing and correcting specification errors
- Testing and managing multi-collinearity
- Testing and managing Autocorrelation
- Testing and managing Heteroscedasticity
- Estimation of regressions with dummy variables

**AEC-506**

**Agricultural Developments and Policy Analysis**

**2+0**

### Why this course?

The ultimate aim of the economies is to attain a satisfactory level of development. Development ensures that there is not only increase in income but also the distribution is such that lesser inequalities exist. The students need to know what is development and its related concepts. All the policies framed are with one sole objective of increasing the welfare. Thus, once concept of development is buildup, students can better understand policies and their genesis.

### Aim of the course

Concept of economic development and policy, theories of development, performance of Indian agriculture. The process and implementation of policies over a period of time.

### Organization of the course

The course is organized as follows:

No Block	Unit
1. Basic concepts	1. Introduction
2. Theoretical Concepts	1. Theories of Agricultural Development
3. Performance and policies	1. Performance of Indian Agriculture

## 2. Agricultural Policy: Process and Implementation

### Theory

#### Block 1: Introduction

##### Unit 1: Introduction

Role of agriculture in economic/ rural development – Evolution of thinking on agriculture and development; Agricultural development – meaning, stages and determinants–Population and food supply–need for sound agricultural policies

#### Block 2: Theoretical Concepts

##### Unit 1: Theories of Agricultural Development

Resource exploitation model- Conservation model- Location (Urban impact) model- Diffusion model- High pay-off input model-Induced Innovation Model- Agricultural R&D and Linkages.

#### Block 3: Performance and policies

##### Unit 1: Performance of Indian Agriculture

Agrarian structure and land relations; trends in performance and productivity; agrarian structure and technology; credit, commerce and technology; capital formation; subsidies; pricing and procurement; Post Green Revolution agriculture; Production and productivity crisis in agriculture; Regional differences; Food Security, PDS system and Malnutrition.

##### Unit 2: Agricultural Policy: Process and Implementation

Instruments of Agricultural Policy; Process of agricultural policy formulation, implementation, Monitoring and Evaluation in India; Global experiences in participatory approach to Agricultural policy process; critical review of various elements of Indian agricultural policy-resource policies – credit policies – input and product marketing policies – price policies; WTO – Agreement on Agriculture; Planning models. Planning for utilization of resources and Indian Five-Year Plans.

<b>AEC-507</b>	<b>Agricultural Finance and Project Management</b>	<b>2+1</b>
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### Why this course?

Money is the fuel of driving all the economic activities. India is a land of small and marginal farmers. The financial conditions of the farmers are not so strong that they can finance themselves. They require credit to meet the requirements of inputs. Thus, the student should know the sources, principles involved and types of credit available. The institutions involved and on what grounds the finance is given to the farmer. What are the risks involved and how to overcome them?

### Aim of the course

This course is designed with an objective to deliver knowledge of the principles, procedures, problems and policies relating to financing agricultural firms. In addition to this the students are also given knowledge about the research developments in the subject. The approach is analytic.

### Organization of the course

The course is organized as follows:

No Block	Unit
1. Introduction to Agricultural Finance	1. Basic Concepts: A review
2. Credit and financial analysis	1. Credit and its aspects 2. Financial analysis
3. Project and risk management	1. Project Overview 2. Risk and its Management

### Theory

#### Block 1: Introduction to Agricultural Finance

### **Unit 1: 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.

### **Block 2: Credit and Financial Analysis**

#### **Unit 1: 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.

#### **Unit 2: 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.

### **Block 3- Project and Risk Management**

#### **Unit1: 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. Network Techniques–PERT and CPM.

#### **Unit 2: 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;
- Preparation of project report
- 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.

<b>AEC-508</b>	<b>Linear Programming</b>	<b>1+1</b>
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**Why this course:**

Linear programming is one of the widely used technique for decision-making. Understanding of method of linear programming will be helpful to sharpen the skills of students in agricultural planning while dealing with allocation of limited resources such as land, labour, water supply, capital, etc. in a way so as to maximise net revenue.

**Objective**

The objective of this course is to introduce the students to concepts and applications of linear programming techniques which will be helpful for practical decision-making

**Organization of the course**

The course is organized as follows-

No Block	Unit
1. Introduction to quantitative techniques in decision making	1. Concepts of decision making
2. Simplex method and its extension	1. Simplex method 2. Extension of linear programming models
3. Game Theory	1. Concepts of game theory

**Theory**

**Block – I - Introduction to quantitative techniques in decision making**

**UNIT I - Concepts of decision making**

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. Inventory management.

**Block II - Simplex method and its extension**

**UNIT I - Simplex method**

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. Theory of duality.

**UNIT II - Extension of linear programming models**

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

**Block III - Game Theory**

**UNIT I - Concepts of game theory**

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 methods. Formulation of the simplex matrices for typical farm situations. Methods of solving transportation problems. Problems related to Game theory.

<b>AEC-509</b>	<b>Research Methodology for Social Sciences</b>	<b>1+1</b>
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**Why this course**

Planning of research is very crucial to conduct successful research. There is need to give an insight to the student about how to conduct a research, right from data collection to analysis and finally writing the references.

### **Aim of the course**

The course deals with scientific methods of research, the initiation of an inquiry, formulation of research problems and hypotheses, the role of induction and deduction in research, collection and analysis of data and interpretation of results

### **Organization of the course**

The course is organised as follows:

No Block	Unit
1. Concepts of research methodology	1. Concepts of research methodology
2. Building up hypothesis and sample selection	1. Hypothesis: Framing and Testing
	2. Sampling
3. Data collection and analysis	1. Data collection
	2. Data Analysis

### **Theory**

#### **Block 1: Concepts of research methodology**

##### **Unit 1: Concepts of research methodology**

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

#### **Block 2- Building up hypothesis and sample selection**

##### **Unit 1: Hypothesis**

Framing and Testing Hypothesis–meaning–characteristics–types of hypothesis–review of literature–Setting of Course Objective and hypotheses–testing of hypothesis.

##### **Unit 2: 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.

#### **Block 3- Data Collection and Analysis**

##### **Unit 1: 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 Pretesting.

##### **Unit 2: Data Analysis**

Data coding, tabulation, cleaning validation of data. Tools of analysis – data processing. Interpretation of results – Preparing research report / thesis–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.

<b>AEC-510</b>	<b>Indian Economy: History and Contemporary Issue</b>	<b>2+0</b>
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**Why this course?**

India is a developing economy. The evolution of the Indian economy will enlighten the student with how an economy develops. Students will understand how the policies and measures taken shape up the economy of the country.

**Aim of the course**

To introduce the students to the economic history over a period of time. It also highlights the contemporary issues of Indian economy.

**Organization of the course**

The course is organized as follows:

No Block	Unit
1. History of Indian Economy	1. India from Independence to Liberalization
	2. India since 1980's (Liberalization and Beyond): Overview
	3. Macro Trends Since 1990
2. Contemporary Issues	1. Contemporary Issues

**Theory**

**Block 1-History of Indian Economy**

**Unit 1: India from Independence to Liberalization**

An overview of the economic developments during the period 1947-1980; Objectives and strategies of planned economic development and the role of the State; Sectoral growth performance; savings and investment; Demographic trends and issues; education; health and malnutrition; Trends and policies in poverty; inequality and unemployment.

**Unit 2: India Since 1980's (Liberalization and Beyond): Overview**

Policy Changes since 1980s. The 1990 Crisis. Causes and Effects of Regional differences: infrastructure, primary, secondary and tertiary sector.

**Unit 3: Macro Trends Since 1990**

Growth; Savings and Investment, Employment; productivity; diversification; Agro- based industries; competition policy; foreign investment, Regional differences.

**Block 2- Contemporary Issues**

**Unit1: Contemporary Issues**

Monetary and Financial trends- areas of government spending in India, Capital expenditure, revenue expenditure, plan expenditure, non-plan expenditure, Deficits (fiscal, primary, revenue), impact of fiscal deficit on economy, Capital receipts, revenue receipts, tax and non tax revenue, direct and indirect taxes, need to rationalize tax structure. Goods and Services Tax (GST). Union Budget, Zero base budgeting, Gender budgeting, Fiscal devolution and centre state financial relations in India, WPI, CPI implicit deflators. Foreign Trade policy.



**Why this course?**

The era of Globalization, liberalization and privatization has unified the whole world. There is trade across national boundaries and one economy has effect on the other. Getting familiar with national economy is not sufficient to understand the mechanism of trade and economic aspects. Thus, this course is designed to teach student about the trade as international level.

**Aim of the course**

The major objective of this course is to give an insight of the interactions between national economies. What are the theories governing the trade across national boundaries. The methods involved to regulate the international trade and institutions involved.

**Organization of the course**

The course is organized as follows:

No Block	Unit
1. Introduction	1. Concepts of International Economics
2. Models, Rate and terms of trade	1. Barriers to trade 2. Models of trade 3. Rates and Terms of trade
3. Institutions	1. Trades Institutions

**Theory****Block 1- Introduction****Unit 1: Concepts of International Economics**

Scope and Significance of International Economics – The role of trade- General Equilibrium in a Closed Economy (Autarky Equilibrium) – Equilibrium in a Simple Open Economy-Possibility of World Trade- Trade gains and Trade Equilibrium.

**Block 2- Models, Rate and Terms of Trade****Unit 1: Barriers to trade**

Tariff, Producer Subsidy, Export Subsidy, Import Quota and Export Voluntary Restraints- The Case of Small Country and Large Country Case.

**Unit 2: Models of trade**

Ricardian Model of Trade- Specific Factors Model- Heckscher - Ohlin Model - Trade Creation and Trade Diversion – Offer Curve - Export Supply Elasticity and Import Demand Elasticity-Comparative Advantage and Absolute Advantage.

**Unit 3: Rates and Terms of trade**

Foreign Exchange Rates. Official Exchange Rate and Shadow Exchange Rate - Walra's Law and Terms of Trade-Trade Blocks.

**Block 3- Institutions****Unit 1: Trades Institutions**

IMF, World Bank, IDA, IFC, ADB- International Trade agreements- Uruguay Round-GATT-WTO.

**Practical**

- Producer's Surplus, Consumer's Surplus, National Welfare under Autarky and Free Trade Equilibrium with small and large country assumption.
- Estimation of Trade Gains
- Estimation of competitive and comparative measures like NPC, EPC, ERP and DRC
- Estimation of Offer Curve Elasticity

- Estimation of Effect of Tariff, Export Subsidy, Producer Subsidy, Import Quota and Export Voluntary Restraints on National Welfare
- Estimation of Ricardian Model
- Estimation of Effect of Trade under Specific Factor Model
- Estimation of trade Equilibrium under Heckscher-Ohlin model.

<b>AEC-512</b>	<b>Institutional Economics</b>	<b>1+0</b>
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**Why this course?**

Institutions are involved in framing of economic development. The human behavior is governed by the institutions working in their environment. Thus, the student need to understand the institutions and their working.

**Aim of the course**

To develop critical and informed understanding about institutions, their role in the working of economy. Exposure of issues, policies & regulations and its application in agricultural system

**Organization of the course**

The course is organized as follows:

No Block	Unit
1. Introduction	1. Basics of Institutional Economics
2. Approaches	1. Institutional changes & Resource allocation
	2. Group and collective Approach
3. Law Protection and Institutions	1. Property rights
	2. Agrarian Institutions

**Theory Syllabus**

**BLOCK 1: Introduction**

**UNIT I : Basics of Institutional Economics**

Old and New Institutional Economics - Institutional Economics Vs Neo- classical, Economics. Definition of institutions – Distinction between institutions and organizations - Institutional evolution

**BLOCK 2: Approaches**

**Unit I : Institutional changes & Resource allocation**

Institutional change and economic performance - national and international economic institutions. Transaction cost economics – Transaction costs and the allocation of resources. Transaction costs and efficiency. Asymmetric information, - Moral hazard and Principal-Agent problem.

**UNIT II : Group and collective Approach**

Free rider problem – path dependency – Interlinked transactions. Collective action and the elimination of free-rider problem - The logic of collective action and its role in reducing free rider problem – theory of Groups. Rent seeking – interest groups and policy formulation.

**BLOCK 3: Law Protection and Institutions**

**Unit I : Property right**

Economic analysis of property rights- property rights regimes – private property – State Property - Common property Resources (CPRs) – public goods and club goods.

**UNIT II : Agrarian Institution**

Special features of institutional arrangements in agriculture – Transaction costs in agriculture -Case Studies - Theories of agrarian institutions - tenancy institutions.

**Why this course?**

Sustainable development is the need of the hour. The economic activities affect not only the society but also the environment. Every activity has its social cost. The students, hence will be taught about the economic aspect of environment.

**Aim of the course**

To understand about economics of environment and social costs incurred due to economic development. Work out methods to maintain environment quality and reduce social costs

**Organization of the course**

The course is organized as follows:

No Block	Unit
1. Introduction to natural resource and environmental economics	1. Basic Foundation
2. Insight of the subject	1. Theories and economics of natural resources 2. Functioning of market
3. Dealing with Issues and sustainability	1. Environmental Issues 2. Regulations 3. Sustainability aspects

**Theory**

**Block 1- Introduction to natural resource and environmental economics**

**Unit 1: 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.

**Block 2- Insights of the subject**

**Unit 1: 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.

**Unit 2: 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.

**Block 3- Dealing with the issues and sustainability**

**Unit1: 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.

**Unit 2: Regulations**

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

**Unit 3: 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.

<b>AEC-514</b>	<b>Commodity Futures Trading</b>	<b>2+0</b>
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**Why this course?**

Risk is involved in marketing. Price fluctuation is a very common phenomenon in agriculture marketing. In such situation selling of commodity in future market serves as a resort to insulate from this uncertainty. Thus, knowledge of futures market is helpful in...

**Aim of the course**

To disseminate the knowledge about risk mitigating measures especially future trading. The future trading in agricultural commodities is increasing day by day therefore the role of SEBI, functioning of commodity exchanges are discussed.

**Organization of the course**

The course is organized as follows:

No Block	Unit
1. Introduction to commodity market	1. Concepts of commodity future trading
2. Techniques and risks in commodity Market	1. Technical aspects
	2. Risk and its Management
3. Commodity exchange and market analysis	1. Commodity Exchange–A review
	2. Analysis of commodity market

**Theory Syllabus :**

**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.

<b>AEC-515</b>	<b>Development Economics</b>	<b>2+0</b>
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**Why this course?**

Development is more important than growth. The development of a nation ensures that condition of welfare prevails. The student has to understand different measures of development. How to measure them and relevant theories.

**Aim of the course**

To develop concept of growth and development. Methods and theories of measuring development. Study of different developed economies will give exposure towards measures to create economic upliftment.

**Organization of the course**

The course is organized as follows:

No Block	Unit
1. Introduction to development economics	1. Conceptions of Development
2. Theories and comparison	1. Theories of Economic growth and Development 2. Comparative Economic Development

**Theory****Block 1- Introduction to Development Economics****Unit 1: 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, Connection between inequality and development, poverty measurement, unemployment and environmental degradation.

**Block 2- Theories and comparison****Unit 1: 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, multi-sectoral models.

**Unit 2: Comparative Economic Development**

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

<b>AEC-516</b>	<b>Rural Marketing</b>	<b>2+0</b>
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**Why this course?**

Rural Marketing is more important than growth. The student has to understand different measures of development. How to measure them and relevant theories.

**Aim of the course**

To explore the possibilities and potential of the rural market. It aims at critically analysing the market opportunities, consumer trends and patterns and development of better marketing strategies for the rural areas.

**Organization of the course**

The course is organized as follows:

## **Theory**

### **UNIT I**

Concept and scope of rural marketing, nature and characteristics of rural markets, potential of rural markets in India

### **UNIT II**

Environmental factors - socio-cultural, economic and other environmental factors affecting rural marketing.

### **UNIT III**

Rural consumer's behaviour - behavior of rural consumers and farmers; buyer characteristics and buying behaviour; Rural v/s urban markets.

### **UNIT IV**

Rural marketing strategy - Marketing of consumer durable and non-durable goods and services in the rural markets with special reference to product planning; product mix, pricing Course Objective, pricing policy and pricing strategy.

### **UNIT V**

Product promotion - Media planning, planning of distribution channels, and organizing personal selling in rural market in India.

<b>AEC-517</b>	<b>Evaluation of Economic Thought</b>	<b>1+0</b>
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### **Why this course?**

Evaluation of Economic Thought is more important. The student has to understand different measures of development. How to measure them and relevant theories.

### **Aim of the course**

Evaluation of Economic thought to study the thoughts of scientists.

### **Organization of the course**

The course is organized as follows:

### **Theory**

#### **Unit I**

Approaches for the study of History of economic thought Absolutist vs. Relativist approaches. Economic Thoughts of the various economist like Adam Smith, Paul Samuelson and Keynes. Economic History: Evolution of economics from Great Depression, Economic theory, econometrics. Development of the Ancient economic thoughts medieval economic thought, Mercantilism(evolution of trade, tariff with new voyages in 1942), physiocracy (circular flow of income), Forerunners of Classical Political Economy.

#### **Unit II**

Development of Classical Thoughts (Adam Smith & Robert Malthus), Development of Classical Thoughts (David Ricardo), Critics of Classical Thoughts, Socialist critics – Socialist, Marxian Economic Ideas - Austrian School of Thought, Origins of Formal Microeconomic Analysis - William Stanley Jevons, Cournot and Dupuit.

#### **Unit III**

The birth of neoclassical economic thought- Marshal & Walrus, General Equilibrium Theory, Welfare Theory and Keynesian economics.

#### **Unit IV**

The Era of globalization - Experiences of developing world - Rigidity of the past "vs " emerging realism, The changing path of international Institutions to economic growth and development approaches.

#### **Unit-V**

Economic Thought in India - Naoroji and Gokhale - Gandhian Economics, Economic thought of independent India - Nehru's economic philosophy, Experiences of the Structural adjustment programmes of the post.

### c. Bachelor Programmes

Semester No.	Term No.	CourseNo.	Credits	Title of the course offered by the department
II	2	ECON 121	2(2+0)	Fundamentals of Agricultural Economics
IV	2	ECON 242	3(2+1)	Agricultural Finance and Cooperation
V	1	ECON 353	3(2+1)	Agricultural Marketing Trade and Prices
V	1	ELE ECON 354	3(2+1)	Agribusiness Management
VI	2	ECON 365	2(1+1)	Farm Management, Production and Resource Economics

#### Course Curricula and syllabi of each subject:

<b>Course :</b> ECON 121	<b>Credit:</b> 2 (2+0)	<b>Semester-II</b>
<b>Course title:</b> Fundamentals of Agricultural Economics		

#### Syllabus

##### Theory

*Economics:* Meaning, scope and subject matter, definitions, activities, approaches to economic analysis; micro and macroeconomics, positive and normative analysis. Nature of economic theory; rationality assumption, concept of equilibrium, economic laws as generalization of human behavior. Basic concepts: Goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare.

Agricultural economics: meaning, definition, characteristics of agriculture, importance and its role in economic development.

*Demand:* meaning, law of demand, demand schedule and demand curve, determinants, utility theory; law of diminishing marginal utility, equi-marginal utility principle. Consumer's equilibrium and derivation of demand curve, concept of consumer's surplus. Elasticity of demand: concept and measurement of price elasticity, income elasticity and cross elasticity.

Production: process, creation of utility, factors of production, input output relationship. *Laws of returns:* Law of variable proportions and law of returns to scale.

*Cost:* **Cost concepts, short run and long run cost curves.** Supply: Stock v/s supply, law of supply, supply schedule, supply curve, determinants of supply, elasticity of supply.

**Market structure: meaning and types of markets, basic features of perfectly competitive and imperfect markets. Price determination under perfect competition; short run and long run equilibrium of firm and industry, shut down and break even points.**

Distribution theory: meaning, factor market and pricing of factors of production. Concepts of rent, wage, interest and profit.

*National income:* Meaning and importance, circular flow, concepts of national income accounting and approaches to measurement, difficulties in measurement. Population: Importance, Malthusian and Optimum population theories, natural and socio-economic determinants, current policies and programmes on population control.

Money: Barter system of exchange and its problems, evolution, meaning and functions of money, classification of money, money supply, general price index, inflation and deflation. **Banking: Role in modern economy, types of banks, functions of commercial and central bank, credit creation**

**policy.**

**Agricultural and public finance: meaning, micro v/s macro finance, need for agricultural finance,** public revenue and public expenditure. *Tax:* meaning, direct and indirect taxes, agricultural taxation, **VAT.** *Economic systems:* Concepts of economy and its functions, important features of capitalistic, socialistic and mixed economies, elements of economic planning.

<b>Course :</b> ECON 242	<b>Credit:</b> 3 (2+1)	<b>Semester-IV</b>
<b>Course title:</b> Agricultural Finance and Cooperation		

**Syllabus**

**Theory**

Agricultural Finance- meaning, scope and significance, credit needs and its role in Indian agriculture. Agricultural credit - meaning, definition, need, classification. Credit analysis: 3 R's, and **5C's of credits & 7p's of credit.** Sources of agricultural finance: institutional and noninstitutional sources, commercial banks, social control and nationalization of commercial banks, Micro financing including KCC. Lead bank scheme, RRBs, Scale of finance and unit cost. An introduction to higher financing institutions - RBI, NABARD, ADB, IMF, world bank, Deposit Insurance and Credit Guarantee Corporation of India. Cost of credit. Recent development in agricultural credit. Preparation and analysis of financial statements - Balance Sheet and Income Statement. Basic guidelines for preparation of project reports- Bank norms - SWOT analysis.

Agricultural Cooperation - Meaning, brief history of cooperative development in India, objectives, principles of cooperation, significance of cooperatives in Indian agriculture. Agricultural Cooperation in India- credit, marketing, consumer and multi-purpose cooperatives, farmers' service cooperative societies, processing cooperatives, farming cooperatives, cooperative warehousing; role of ICA, NCUI, NCDC, NAFED.

**Practical**

- Determination of most profitable level of capital use. Optimum allocation of limited amount of capital among different enterprise.
- Analysis of progress and performance of cooperatives using published data. Analysis of progress and performance of commercial banks and RRBs using published data.
- Visit to a commercial bank, cooperative bank and cooperative society to acquire firsthand knowledge of their management, schemes and procedures.
- Estimation of credit requirement of farm business - A case study.
- Preparation and analysis of balance sheet - A case study.
- Preparation and analysis of income statement - A case study.
- Appraisal of a loan proposal - A case study.
- Techno-economic parameters for preparation of projects. Preparation of Bankable projects for various agricultural products and its value added products.
- Seminar on selected topics.

<b>Course :</b> ECON 353	<b>Credit:</b> 3 (2+1)	<b>Semester-V</b>
<b>Course title:</b> Agricultural Marketing Trade and Prices		

**Syllabus**

**Theory**

Agricultural Marketing: Concepts and definitions of market, marketing, agricultural marketing, market structure, marketing mix and market segmentation, classification and characteristics of



agricultural markets; demand, supply and producer's surplus of agri-commodities: nature and determinants of demand and supply of farm products,

Producer's surplus - meaning and its types, marketable and marketed surplus, factors affecting marketable surplus of agri-commodities; product life cycle (PLC) and competitive strategies: Meaning and stages in PLC; characteristics of PLC; strategies in different stages of PLC; pricing and promotion strategies: pricing considerations and approaches - cost based and competition based pricing; market promotion - advertising, personal selling, sales promotion and publicity - their meaning and merits & demerits; marketing process and functions:

Marketing process-concentration, dispersion and equalization; exchange functions - buying and selling; physical functions - storage, transport and processing; facilitating functions - packaging, branding, grading, quality control and labeling (Agmark); Market functionaries and marketing channels: Types and importance of agencies involved in agricultural marketing; meaning and definition of marketing channel; number of channel levels; marketing channels for different farm products; Integration, efficiency, costs and price spread: Meaning, definition and types of market integration; marketing efficiency; marketing costs, margins and price spread; factors affecting cost of marketing; reasons for higher marketing costs of farm commodities; ways of reducing marketing costs;

Role of Govt. in agricultural marketing: Public sector institutions- CWC, SWC, FCI, CACP & DMI - their objectives and functions; cooperative marketing in India; Risk in marketing: Types of risk in marketing; speculation & hedging; an overview of futures trading; Agricultural prices and policy: Meaning and functions of price; administered prices; need for agricultural price policy;

Trade: Concept of International Trade and its need, theories of absolute and comparative advantage. Present status and prospects of international trade in agri commodities; GATT and WTO; Agreement on Agriculture (AoA) and its implications on Indian agriculture; IPR.

### **Practical**

Plotting and study of demand and supply curves and calculation of elasticities; Study of relationship between market arrivals and prices of some selected commodities; Computation of marketable and marketed surplus of important commodities; Study of price behaviour over time for some selected commodities; Construction of index numbers; Visit to a local market to study various marketing functions performed by different agencies, identification of marketing channels for selected commodity, collection of data regarding marketing costs, margins and price spread and presentation of report in the class; Visit to market institutions - NAFED, SWC, CWC, cooperative marketing society, etc. to study their organization and functioning; Application of principles of comparative advantage of international trade.

<b>Course :</b> ELE ECON 354	<b>Credit:</b> 3 (2+1)	<b>Semester-V</b>
<b>Course title:</b>	Agribusiness Management	

### **Syllabus**

#### **Theory**

Transformation of agriculture into agribusiness, various stakeholders and components of agribusiness systems. Importance of agribusiness in the Indian economy and New Agricultural Policy. Distinctive features of Agribusiness Management: Importance and needs of agro-based industries, Classification of industries and types of agro based industries. Institutional arrangement, procedures to set up agro based industries. Constraints in establishing agro-based industries. Agri-value chain: Understanding primary and support activities and their linkages. Business environment: PEST & SWOT analysis. Management functions: Roles & activities, Organization culture. Planning, meaning, definition, types of plans. Purpose or mission, goals or objectives, Strategies, policies procedures, rules, programs and budget. Components of a business plan, Steps in planning and implementation. Organization staffing,

directing and motivation. Ordering, leading, supervision, communications, control. Capital Management and Financial management of Agribusiness. Financial statements and their importance. Marketing Management: Segmentation, targeting & positioning. Marketing mix and marketing strategies. Consumer behavior analysis, Product Life Cycle (PLC). Sales & Distribution Management. Pricing policy, various pricing methods. Project Management definition, project cycle, identification, formulation, appraisal, implementation, monitoring and evaluation. Project Appraisal and evaluation techniques.

**Practical**

Study of agri-input markets: Seed, fertilizers, pesticides. Study of output markets: grains, fruits, vegetables, flowers. Study of product markets, retails trade commodity trading, and value added products. Study of financing institutions- Cooperative, Commercial banks, RRBs, Agribusiness Finance Limited, NABARD. Preparations of projects and Feasibility reports for agribusiness entrepreneur. Appraisal/evaluation techniques of identifying viable project- Non-discounting techniques. Case study of agro-based industries. Trend and growth rate of prices of agricultural commodities. Net present worth technique for selection of viable project. Internal rate of return.

<b>Course</b>	ECON 365	<b>Credits</b>	2(1+1)	<b>Semester-VI</b>
<b>Course Title</b>	Farm Management, Production and Resource Economics			

**Theory**

Meaning, concept of farm management and objectives. Principles of farm management: concept of production function and its type, use of production function in decision-making on a farm, factor-product, factor-factor and product-product relationship, law of equi-marginal/or principles of opportunity cost and law of comparative advantage.

Types of farming and farm business organization. Meaning and concept of cost, types of costs and their interrelationship, importance of cost in managing farm business and estimation of gross farm income, net farm income, family labor income and farm business income.

Farm business analysis: meaning and concept of farm income and profitability, technical and economic efficiency measures in crop and livestock enterprises. Meaning and importance of farm planning and budgeting, partial and complete budgeting, steps in farm planning and budgeting-linear programming.

Concept of risk and uncertainty occurs in agriculture production, nature and sources of risks and its management strategies.

Concepts of resource economics, differences between NRE and agricultural economics, unique properties of natural resources.

**Practical**

Laws of returns. Computation of depreciation cost of farm assets. Application of equi-marginal returns/opportunity cost principle in allocation of farm resources. Determination of most profitable level of inputs use in a farm production process. Determination of least cost combination of inputs. Selection of most profitable enterprise combination. Application of cost principles including CACP concepts in the estimation of cost of crop and livestock enterprises. Preparation of farm plan and budget, farm records and accounts. Farm financial analysis, balance sheet and income statement.

**4. Infrastructure**


- a. **Laboratories: Nil**
- b. **Name of the important instruments/facilities: Nil**
- c. **Activities: Nil**
- d. **Photographs: Nil**

## 5. Faculty


### Academic staff:

**Information : Particulars**

<b>Recent Photograph</b> 	<b>Name of Faculty</b>	:	Dr. S.R. Torane
	<b>Post Held</b>	:	Head & DDR
	<b>Date of Birth</b>	:	15/10/1969
	<b>Qualification</b>	:	M.Sc.(Agri.), Ph. D.
	<b>Area of Specialization</b>	:	Agril. Economics
	<b>Experience (Years)</b>	:	27
	<b>Research Project guided</b>	:	
	<b>Ph.D.</b>	:	01
	<b>M.Sc.</b>	:	-
	<b>Present area of Research</b>	:	Production Economics, Marketing
<b>Contact details</b>			
<b>Mobile No.</b>	:	9422822282	
<b>Email</b>	:	srtorane@gmail.com	

<b>Recent Photograph</b> 	<b>Name of Faculty</b>	:	Dr. V.G. Naik
	<b>Post Held</b>	:	Associate Professor
	<b>Date of Birth</b>	:	14/01/1962
	<b>Qualification</b>	:	M.Sc.(Agri.), Ph. D.
	<b>Area of Specialization</b>	:	Farm Management & Agril. Marketing
	<b>Experience (Years)</b>	:	31
	<b>Research Project guided</b>	:	
	<b>Ph.D.</b>	:	-
	<b>M.Sc.</b>	:	12
	<b>Present area of Research</b>	:	Agril. Marketing & Management
<b>Contact details</b>			
<b>Mobile No.</b>	:	9420050977	
<b>Email</b>	:	naikvg123@rediffmail.com	


<b>Recent Photograph</b> 	<b>Name of Faculty</b>	:	Dr. P. J. Kshirsagar
	<b>Post Held</b>	:	Associate Professor
	<b>Date of Birth</b>	:	2 <sup>nd</sup> March 1968
	<b>Qualification</b>	:	M. Sc. (Agri) Ph. D.
	<b>Area of Specialization</b>	:	Agril. Economics
	<b>Experience (Years)</b>	:	29
	<b>Research Project guided</b>	:	
	<b>Ph.D.</b>	:	01
	<b>M.Sc.</b>	:	10
	<b>Present area of Research</b>	:	Agril. Production Economics
<b>Contact details</b>			
<b>Mobile No.</b>	:	7709285523, 9422064705	
<b>Email</b>	:	sagartarang@rediffmail.com	

<b>Recent Photograph</b> 	<b>Name of Faculty</b>	:	Dr. D.B. Malave
	<b>Post Held</b>	:	Associate Professor
	<b>Date of Birth</b>	:	17/06/1965
	<b>Qualification</b>	:	M.Sc.(Agri.), Ph. D.
	<b>Area of Specialization</b>	:	Agril. Economics
	<b>Experience (Years)</b>	:	23
	<b>Research Project guided</b>	:	
	<b>Ph.D.</b>	:	-
	<b>M.Sc.</b>	:	10
	<b>Present area of Research</b>	:	Agricultural Marketing
<b>Contact details</b>			
<b>Mobile No.</b>	:	9422054405	
<b>Email</b>	:	dbmalave@rediffmail.com	


<b>Recent Photograph</b> 	<b>Name of Faculty</b>	:	Dr. S.S. Bhosale
	<b>Post Held</b>	:	Field Officer (Assistant Professor)
	<b>Date of Birth</b>	:	14/11/1964
	<b>Qualification</b>	:	M.Sc.(Agri.), Ph. D.
	<b>Area of Specialization</b>	:	Farm Management and Production Economics
	<b>Experience (Years)</b>	:	12
	<b>Research Project guided</b>	:	Nil
	<b>Present area of Research</b>	:	Farm Management Studies
	<b>Contact details</b>		
	<b>Mobile No.</b>	:	8087941357
<b>Email</b>	:	bhosaleshivaji1964@gmail.com	


5. b)

### Research Staff

<b>Recent Photograph</b> 	<b>Name of Faculty</b>	:	Dr. S.R. Bagade
	<b>Post Held</b>	:	Sr. Research Assistant
	<b>Date of Birth</b>	:	25/08/1970
	<b>Qualification</b>	:	M.Sc.(Agri.), Ph. D.
	<b>Area of Specialization</b>	:	Agril. Economics
	<b>Experience (Years)</b>	:	15
	<b>Research Project guided</b>	:	Nil
	<b>Present area of Research</b>	:	Production Economics
	<b>Contact details</b>		
	<b>Mobile No.</b>	:	9422382492
<b>Email</b>	:	sr_bagade@rediffmail.com srbagade@gmail.com	

<b>Recent Photograph</b> 	<b>Name of Faculty</b>	:	Shri. A.D. Hake
	<b>Post Held</b>	:	Jr. Research Assistant
	<b>Date of Birth</b>	:	29/05/1987
	<b>Qualification</b>	:	M.Sc.(Agri.)
	<b>Area of Specialization</b>	:	Agril. Economics
	<b>Experience (Years)</b>	:	13
	<b>Research Project guided</b>	:	Nil
	<b>Present area of Research</b>	:	-
	<b>Contact details</b>		
	<b>Mobile No.</b>	:	8275454975
<b>Email</b>	:	Ankush2624@gmail.com	

<b>Recent Photograph</b> 	<b>Name of Faculty</b>	:	Smt. K.G. Mahale
	<b>Post Held</b>	:	Jr. Research Assistant
	<b>Date of Birth</b>	:	27/05/1984
	<b>Qualification</b>	:	B.Sc.(Agri.)
	<b>Area of Specialization</b>	:	-
	<b>Experience (Years)</b>	:	14
	<b>Research Project guided</b>	:	-
	<b>Present area of Research</b>	:	-
	<b>Contact details</b>		
	<b>Mobile No.</b>	:	8010738062
<b>Email</b>	:	mahalekhushi@gmail.com	

<b>Recent Photograph</b> 	<b>Name of Faculty</b>	:	Shri. S.G. Tambat
	<b>Post Held</b>	:	Jr. Research Assistant
	<b>Date of Birth</b>	:	27/07/1978
	<b>Qualification</b>	:	M.Sc.(Agri.)
	<b>Area of Specialization</b>	:	Plant Pathology
	<b>Experience (Years)</b>	:	14
	<b>Research Project guided</b>	:	-
	<b>Present area of Research</b>	:	-
	<b>Contact details</b>		
	<b>Mobile No.</b>	:	9405086136
<b>Email</b>	:	Sachintambat27@gmail.com	

## 6. Instructional Farm

- a. Location: Nil
- b. Infrastructure: Nil
- c. Activities: Nil
- d. Photographs: Nil

## 7. Research Activities and Achievements (including projects)

- a. Variety/Implements released: Nil
- b. Research Recommendations:

- i. **Joint AGRESCO-2013 recommendation** : Marketing of Kokum product be made combinely with logo/brand name.
- ii. **Economic impact of technologies developed for *Kharif* rice by Dr.B.S.K.K.V., Dapoli (2013-14).**

The adoption of rice technologies by farmers in small, medium and large group was 47.91 per cent, 56 per cent and 66.78 per cent resulted into yield gap to the extent of 44.16 per cent, 36.88 per cent and 28.52 per cent. Therefore, it is recommended to motivate the farmers through extension agencies for adoption of full package of all technologies for deriving economic benefits in the rice production.

Among the various technologies released for rice by the University, farmers be motivated and trained for proper adoption of major yield contributing technologies viz., line spacing, spacing between hills, No. of Seedling per hill, application of nitrogen and application of phosphorus as to increase production and productivity of rice.
- iii. **Cashew Processing in South Konkan region – An Economic Analysis (2013-14).**

In Home Scale, Small & Medium and Large Scale cashew processing units with high capital investment the benefit cost ratio was 1.29, 1.48 and 1.50, respectively. Hence, it is recommended that Government and financial bodies to design a long term policy for working capital finance to cashew processors at low rate of interest.

It is recommended to organize and educate cashew growers to harvest matured cashewnut for better price realization and minimizing storage losses at processor's level to ensure quality of cashew kernels.

It is recommended to use available co-operative institutions in the region with their storage facilities to ensure quality supply of raw material and minimizing marketing problems.
- iv. **Identification of Existing Farming System in North Konkan Zone (2013-14).**

In North Konkan region, Crop production, dairy and goatery farming system giving more gainful employment and per capita income. Hence, it is recommended to motivate the farmers to adopt these farming systems.
- v. **Impact of ECF (Experiments on cultivator's field) trails on economy of farmers (2013-14).**

Experiments on cultivator's field (ECF) had increased employment 21.31 per cent and income has increased by 84.13 per cent. It is recommended that for effective transfer of recommended agricultural technologies schemes like ECF be implemented by the extension agencies and of the University.
- vi. **An Economic analysis of *Lakhi baug* (coconut based cropping system) in Konkan region (2013-14).**

The mixed cropping in *lakhi baug* with annual and perennial crops is profitable in terms of both income and employment over sole cropping of coconut. However *lakhi baug* growers were not following mixed cropping in systematic manner. Hence, it is recommended to motivate the farmers to adopt recommendations of the University on *lakhi baug* to generate maximum profit from *lakhi baug*.

**vii. Comparative Economics of Goat Rearing in Konkan Region (2013-14).**

The economic analysis revealed that variable cost is covered in group with flock size of 30 goats through selling price living considerable net profit to the goat keeper. Hence, to reap the benefits of scale of economies it is recommended to have the minimum flock size of 30 goats (28 does and 2 bucks).

**viii. Returns to Investment in Rice Research and Extension in Konkan region (2014-15)**

The every Rs. 100 invested on rice research and extension yields Rs. 10.16 per annum. In Konkan region, even though area under rice is declining (0.39%), productivity of rice is increasing (1.39%). Hence it is recommended that government should provide more funds for research and extension in rice crop in order to increase rice production.

**ix. Study on value addition in Sapota in palghar district (2014-15)**

The benefit cost ratio in sapota powder was 4.82 and in chips 4.20, indicated that each rupee invested in sapota processing gave higher returns and provided subsidiary income and employment to household. It is recommended to strengthen capacity building of women and youth for employment generation and profitability through value addition in sapota.

**x. Impact of Technologies Developed for Mango (Alphonso) Production by Dr. B.S.K.K.V., Dapoli : An Economic Analysis (2015-16)**

Low level of technologies adoption (56.20%) released by the University resulted in the yield gap of 40.84 per cent than the demonstration yield. The major constraints mentioned for the gap were lower prices by traders (90%), non-availability of paclobutrazol (87%), chemical fertilizers (54%) and insecticides & pesticides (55%). For realizing maximizing returns from mango production it is recommended that :

- Local institutions should provide place in consuming areas in city for direct sale of mangoes.
- The Department of Agriculture plan for increasing availability of paclobutrazol and chemical fertilizers at reasonable rates in time.
- The Department of Agriculture plan for availability of plant protection chemicals in time for control of diseases and pest.

**xi. Economics of Jasmine flower production and marketing in Palghar District (2015-16)**

The Benefit-Cost ratio (3.11 per cent) indicated jasmine (*Mogra*) flowers cultivation is remunerative crop. It is recommended to motivate to the farmer cultivate jasmine flowers to generate the self-employment to increase their income level and standard of living.

**xii. Economics of Fish production in farm pond at household level in Raigad district (2015-16)**

The farm pond fish farming is profitable enterprise (B.C ratio 2.40) and there are no problems in marketing and disposal. Therefore, the farmers be encouraged for fish farming at household level for gainful employment throughout the year and better income by extension agencies.

**xiii. Temporal and Structural Changes in Cost of Cultivation of Rice in Konkan Region (2015-16)**

In Konkan region expenditure on human labour accounts for 64 per cent of cost of production of rice, to minimize the per unit cost of production of rice it is recommended to give impetus to farm mechanization.

**xiv. Economics of production, processing and disposal of turmeric in Sindhudurg district (M.S.) (2016-17)**

There was additional net income of ` 6090/- per quintal when turmeric powder was sold in the market as compared to dry rhizomes. Therefore, it is recommended to motivate farmers to sell the turmeric in powder form rather than selling in raw form through ATMA and KVKs.

**xv. Economics of production and marketing of white Onion in Alibag tahsil of Raigad District (2016-17)**

The per hectare benefit cost ratio was 1.49 from white onion cultivation in Alibag taluka. It is recommended that the famers of Alibag taluka be trained in storage methods through extension agencies



for realizing additional economic benefits.

**xvi. Economics analysis of production and disposal of Aonla in South Konkan Region (2016-17)**

The internal rate of return on investment in aonla plantation observed to be 20.33 per cent. Hence, it is recommended to train growers regarding aonla production technologies through demonstrations.

**xvii. Comparative Economics of Production of Local Varieties and Improved Varieties of Banana in Sindhudurg District (2016-17)**

In South Konkan region benefit cost ratio range from 2.14 to 3.96 in local varieties of banana and 2.61 in improved varieties of banana. Hence, to trained the farmers regarding improved cultivation practices of banana through demonstrations for increasing productivity and profitability.

**xviii. Externalities in use of pesticides in Alphonso mango in Konkan region (2017-18)**

Mango growers apply plant protection chemical indiscriminately and incur extra expenditure of Rs. 5718/ha. It is recommended to educate mango growers to follow plant protection schedule of the University through extension agencies for cost minimization and reduce negative externalities of chemicals.

**xix. Economic Analysis of Post- Harvest Losses in Mango (2017-18)**

- In Konkan region the post harvest losses in mango estimated to Rs. 1100/- crores. Hence, it is recommended to set up post harvest management facility centre for mango at tahsil places.
- In South Konkan region regulated market is existed for Ratnagiri and Sindhudurg district. However, considering increase in the area under mango in these two districts, it is recommended to establish market yard for mango under APMC in each tahsil.
- It is recommended to train the farmers through extension agencies regarding changes in post harvest handling and marketing management in mango.

**xx. Economics of Rejuvenation of Mango Orchards in South Konkan Region of Maharashtra (2017-18)**

After 7 years of rejuvenation of old and senile mango orchards in South Konkan region, per hectare incremental yield was 29.31 q. and incremental net returns were Rs. 53,189/-. Similarly, per hectare saving in expenditure on labour of spraying and harvesting of fruits was 32.10 per cent. Therefore, it is recommended that mango growers in producing area be trained through special schemes by extension agencies to adopt rejuvenation technology of mango orchards of DBSKKV, Dapoli for higher yield and gross income.

**xxi. Economics of cashew nut Marketing and processing in south konkan region (2021-22)**

- 1) In the cashew processing, more than 78 percent of total investment is incurred for purchase of raw cashew nuts. The small scale cashew processors cannot afford the huge investment in purchase of raw cashew nuts; consequently their profit margin is comparatively very low due to the small scale of production. Therefore it is recommended that, the capital should be provided at lower interest rate.
- 2) More than 73 percent cashew grower reported a wastage of cashew apples. It is recommended that the policy regarding cashew apple processing should be formulated for the benefit of cashew growers.

**xxii. Study of Marketing of Mango and other fruits in Ratnagiri District (2021-22)**

In retail fruit sale about 12.56 percent fruit wastage is observed due to more handling of fruits, which results in to 13.62 percent reduction in income, therefore to minimize this problem as per the need of market the shops at ground floor should be provided by concerned agencies to vendors on hiring basis in major markets of Konkan region.

**xxiii. Cashewnut export trade directions: India's perspectives with special reference to Konkan region of Maharashtra State (2022-23)**

Considering large domestic demand for Cashewnut kernel, relatively low export in spite of higher processing capacity (16.54 lakh MT), increase in processing capacity of African countries and their by reduction in import of Cashewnut to India; it is recommended that in case of Konkan region out of cultivable land (15.21 lakh ha) additional area about 46244 ha in Konkan region such as Ratnagiri

district (16522 ha), Sindhudurg district (5646 ha ), Raigad district (13570 ha), Thane district (4515 ha) and Palghar district (5992 ha) should be brought under cashewnut plantation in next three years for export promotion and self-sufficiency.

**c. Research Outcome/Findings: Nil**

**d. Completed Research Projects/Programmes/Schemes :- Nil**

**e. Ongoing Research Projects/Programmes/Schemes:**

**8. Repository of abstracts of the theses: Nil**

**9. Extension Activities**

**a. The training programmes organized :- Nil**

**b. Seminar/Symposia/Conference/Workshop Organized :-Nil**

**c. Farmer Melawa Organized :- Nil**

**d. Radio/TV Talks delivered by the staff members of the Department/Section:**

**e. Farmer-Scientist Forum: Nil**

**f. Other Extension Activities: Nil**

**g. Publications: Nil**

**10. Details of other activities (for e.g. seed production, production of other commodities etc) :- Nil**

**11. Contact Information :- As above in 5(a)(b)**

**12. News and Events :Nil**