

BOS Meeting held on 28.4.22

Final  
2.4.22

University of Lucknow  
M.Sc. (Ag.) AGRICULTURAL ECONOMICS  
Programme  
Regulations.....2022-2023

(As Per Education Division  
Indian Council of Agricultural Research  
New Delhi, BSMA Committee on Social Sciences, April 2009)

1. Applicability

These Regulations shall apply to the M.Sc. (Ag.) Agricultural Economics programme from the session .....2022-23

2. Minimum Eligibility for Admission

- i) Bachelor's degree in respective/ related subjects.
- ii) 7.0/10 or equivalent OGPA/equivalent percentage of marks at Bachelor's degree.

3. Objective

- i. Agricultural markets, inputs and products
- ii. Agricultural and natural resource-based firm production management
- iii. Understanding of issues and changes facing agriculture in the region, nationally, and internationally Basic legal concepts related to business and agriculture.
- iv. Natural resource policy economics Community Development

4. Program Outcome

Gain knowledge relating to disbursement of institutional finance to priority sector, credit management and financial risk management. Acquire the basic knowledge on various appraisal techniques in investment of agricultural projects. To impart knowledge on econometric tools to the students of agricultural economics. Training in econometrics will help the student to analyse the economic problem by applying quantitative techniques. Learn the economics and impacts of agricultural projects and various methods to capture cost and value of project.

Ramgh  
25.3.22  
Dr. Pradeep Kumar Singh

Shivlata  
28.3.22

Dr. Singh  
25/3/22  
Dr. Satyendra K Singh

**M.Sc. (Ag.) AGRICULTURAL ECONOMICS**  
**NAME OF DEPARTMENT: AGRICULTURAL ECONOMICS**

Course No.	Course Title	Credit(s)		
		T	P	
<b>SEMESTER I</b>				
1	ECONMA-101	MICRO ECONOMIC THEORY AND APPLICATIONS	3	0
2	ECONMA-102	MACRO ECONOMICS AND POLICY	3	0
3	ECONMA-103	AGRICULTURAL PRODUCTION ECONOMICS	2	1
4	ECONMA-104	RESEARCH METHODOLOGY FOR SOCIAL SCIENCES	2	1
5	ECONSS-101	STATISTICAL METHODS FOR SOCIAL SCIENCES	2	1
6	ECONNC-101	LIBRARY AND INFORMATION SERVICES	-	-
7	ECONNC-102	BASIC CONCEPTS IN LABORATORY TECHNIQUES	-	-
8	ECONRES-101	RESEARCH WORK	0	2
			12	5
		<b>Total Credit</b>		<b>17</b>
<b>SEMESTER II</b>				
1	ECONMA-201	ECONOMETRICS	2	1
2	ECONMA-202	AGRICULTURAL FINANCE AND PROJECT MANAGEMENT	2	1
3	ECONMI-201	RESEARCH METHODS IN BEHAVIORAL SCIENCES	2	1
4	ECONMI-202	INTERNATIONAL TRADE	2	1
5	ECONNC-201	DISASTER MANAGEMENT	-	-
6	ECONNC-202	AGRICULTURAL RESEARCH, RESEARCH ETHICS AND RURAL DEVELOPMENT PROGRAMMES	-	-
7	ECONRES- 201	RESEARCH WORK	0	4
			8	8
		<b>Total Credit</b>		<b>16</b>
<b>SEMESTER III</b>				
1	ECONMA-301	LINEAR PROGRAMMING	2	1
2	ECONSS-301	AGRICULTURAL MARKETING AND PRICE ANALYSIS	2	1
3	ECONSS-302	NATYRAL RESOURSE AND ENVIRONMENTAL ECONOMICS	2	1
4	ECONRES-301	MASTERS' SEMINAR	0	1
5	ECONNC- 301	INTELLECTUAL PROPERTY AND ITS MANAGEMENT IN AGRICULTURE	-	-

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6	ECONRES-401	M.SC.(AG.) RESEARCH	0	6
			6	10
		<b>Total Credit</b>		16
<b>SEMESTER IV</b>				
1	ECONNC-401	TECHNICAL WRITING AND COMMUNICATIONS SKILLS	-	-
2	ECONRES-401	RESEARCH WORK, RESEARCH REPORT AND VIVA-VOCE	-	8
		<b>Total Credit</b>		8
<b>Grand Total Credits</b>				<b>57</b>

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DEPARTMENT OF AGRICULTURAL ECONOMICS

M.SC. (Ag.) AGRICULTURAL ECONOMICS

Course Contents

ECONMA- 101 MICRO ECONOMIC THEORY AND APPLICATIONS 3+0

Objective

This course is intended to provide an overview of microeconomic theory and its applications. The course starts with the theory of consumer behavior consisting of consumer's utility maximization problem and demand theory. It intends to provide fundamental concepts and models in the theory of production and costs and sets out to provide a basic understanding of price and / or output determination under different types of market structures including factor markets. This course will also expose the students to the theory of general equilibrium and welfare economics.

Program Outcome

After completing the course, the students will be able to have an idea/ overview of the microeconomic theory and its applications.

Theory

UNIT I

Theory of Consumer Behaviour - Cardinal Utility Approach - Ordinal Utility Approach - Income effect and substitution effect - Applications of Indifference curve approach - Revealed Preference Hypothesis - Consumer surplus - Derivation of Demand curve - Elasticity of demand.

UNIT II

Theory of Production - Production functions - Returns to scale and economies of scale - Technical progress - Theory of Costs - Cost curves- Profit maximization and cost minimization - Derivation of supply curve - Law of Supply - Producers' surplus.

UNIT III

Market Equilibrium - Behavior of Firms in Competitive Markets - Perfect Competition- Effect of Taxation and Subsidies on market equilibrium - Monopoly- Monopolistic - Oligopoly- Theory of Factor Markets.

UNIT IV

General Equilibrium Theory - Welfare Economics - Pareto Optimality - Social welfare criteria - Social Welfare functions.

Text Book

- David M Kreps 1990. *A Course in Microeconomic Theory*. Princeton University Press.
- Varian Hal R. 1999. *Intermediate Microeconomics*. Affiliated East-West Press.

Suggested Readings

- Dewitt KK. 2002. *Modern Economic Theory*. Sultan Chand & Co.
- Henderson JM & Quandt RE. 2000. *Microeconomic Theory: A Mathematical Approach*. McGraw-Hill.
- Koutsoyiannis A. 2003. *Modern Microeconomics*. The Macmillan Press.

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**ECONMA-102 MACRO ECONOMICS AND POLICY 3+0**

**Objective**

Macro economics and Policy course is intended to expose the students to macroeconomic concepts and theory, the application of the macro economic theory, and implication of the macroeconomic policies.

**Program Outcome**

After completing the course, the students will be able to know the concepts of macroeconomic and the application of macroeconomic theory, and implication of the macroeconomic policies.

**Theory**

**UNIT I**

Nature and Scope of Macro Economics - Methodology and Keynesian Concepts National Income - Concepts and measurement- Classical theory of Employment and Say's Law- Modern theory of Employment and Effective Demand.

**UNIT II**

Consumption function- Investment and savings - Concept of Multiplier and Accelerator - Output and Employment - Rate of interest - Classical, Neo classical and Keynesian version- Classical theory Vs Keynesian theory - Unemployment and Full employment.

**UNIT III**

Money and classical theories of Money and Price - Keynesian theory of money and Friedman Restatement theory of money - Supply of Money - Demand for Money - Inflation: Nature, Effects and control.

**UNIT IV**

IS & LM frame work - General Equilibrium of product and money markets - Monetary policy - Fiscal policy- Effectiveness of Monetary and Fiscal policy -Central banking. Business cycles - Balance of Payment - Foreign Exchange Rate determination.

**Text Books**

- Ahuja HL. 2007. Macroeconomics: Theory and Policy. S. Chand & Co.
- Engene A Diulio 2006. Macroeconomics. 4th Ed. Schaums' Outlines.

**Suggested Readings**

- Gardner Ackely 1987. Macro Economic: Theory and Policy. Collier Macmillan.
- Dornbusch. 2006. Macroeconomics. McGraw Hill Publication

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**ECONMA- 103 AGRICULTURAL PRODUCTION ECONOMICS 2+1**

**Objective**

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

**Program Outcome**

After completing the course, the students will be able to know the concepts of macroeconomic, and the application of macroeconomic theory and policies.

**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**

1. Different forms of production functions – specification.
2. Estimation and interpretation of production functions – returns to scale, factor shares.
3. 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 through linear programming.

**Text Books**

- Doll JP & Frank O. 1978. Production Economics - Theory and Applications. John Wiley & Sons.
- Sankayan PL. 1983. Introduction to Farm Management. Tata Mc Graw Hill.

**Suggested Readings**

- Beattie BR & Taylor CR. 1985. The Economics of Production. John Wiley & Sons.
- Gardner BL & Rausser GC. 2001. Handbook of Agricultural Economics. Vol. I. Agricultural Production. Elsevier.
- Heady EO. Economics of Agricultural Production and Resource Use. Prentice- Hall.

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**ECONMA -104 RESEARCH METHODOLOGY FOR SOCIAL SCIENCES 2+1**

**Objective**

To expose the students to research methodology used in social sciences. The focus will be on providing knowledge related to research process, data collection and data analysis etc.

**Program Outcome**

After completing the course, the students will be able to know the research methodology used in social sciences.

**Theory**

**UNIT I**

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

**UNIT II**

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

**UNIT III**

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.

**UNIT IV**

Data collection - assessment of data needs - sources of data collection - discussion of different situations. Mailed questionnaire and interview schedule - structured, unstructured, open ended and closed-ended questions. Scaling Techniques. Preparation of schedule - problems in measurement of variables in agriculture. Interviewing techniques and field problems - methods of conducting survey - Reconnaissance survey and Pre testing. Coding editing - tabulation - validation of data. Tools of analysis - data processing. Interpretation of results - Preparing research report / thesis - Universal procedures for preparation of bibliography - writing of research articles.

**Practical**

1. Exercises in problem identification. Project proposals - contents and scope.
2. 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.
3. Scaling Techniques - measurement of scales. Preparation of interview schedule - Field testing. Method of conducting survey. Exercise on coding, editing, tabulation and validation of data.
4. Preparing for data entry into computer.
5. Hypothesis testing - Parametric and Non-Parametric Tests.
6. Exercises on format for Thesis / Report writing. Presentation of the results.

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**Text Books**

- Dhondyal SP. 1997. Research Methodology in Social Sciences and Essentials of Thesis Writing. Amman Publ. House, New Delhi.
- Venkatasubramanian V. 1999. Introduction to Research Methodology in Agricultural and Biological Sciences. SAGE Publ.

**Suggested Readings**

- Black TR. 1993. Evaluating Social Science Research - An Introduction. SAGE Publ.
- Creswell JW. 1999. Research Design - Qualitative and Quantitative Approaches. SAGE Publ.
- Kothari CR. 2004. Research Methodology - Methods and Techniques. Wishwa Prakashan, Chennai.
- Rao KV. 1993. Research Methodology in Commerce and Management. Sterling Publ., New Delhi.
- Singh AK. 1993. Tests, Measurements and Research Methods in Behavioural Sciences. Tata McGraw-Hill.

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**ECONSS-101: STATISTICAL METHODS FOR SOCIAL SCIENCES 2+1**

**Theory**

**Objective**

This course is meant for students who do not have sufficient background of Statistical Methods. The students would be exposed to concepts of statistical methods and statistical inference that would help them in understanding the importance of statistics.

**Program Outcome**

After completing the course, the students will be able to know the concepts of statistical methods and statistical inference that would help them in understanding the importance of statistics.

**UNIT-I**

Classification, tabulation and graphical representation of data. Box plot, Descriptive statistics. Exploratory data analysis. Theory of probability. Random variable and mathematical expectation. Discrete and continuous probability distribution: Binomial, Poisson, Negative Binomial, Normal distribution, Beta and Gamma distributions and their application

**UNIT-II**

Introduction to theory of estimation and confidence-intervals. Multiple regression and correlation, non linear regression, Regression diagnostics. Selection of variables. Adequacy of models. Application of multivariate analysis.

**UNIT-III**

Probability sampling, Sampling distribution, Simple random sampling. Estimation of proportions, confidence interval, determination of sample size, inverse sampling. Sampling with varying probabilities with replacement. Stratified sampling. Ratio and regression methods of estimation. Cluster sampling. Multi - stage sampling. Self weighting designs. Systematic sampling

**UNIT-IV**

Test of significance of correlation coefficient and regression coefficients. Polynomial models and regression fitting of their parameters. Profit regression analysis by least squares and maximum likelihood methods

**Practical**

1. Exploratory data analysis.
2. Box-Cox plots; fitting of distribution-binomial, poisson, negative, large sample tests,
3. Testing hypothesis based on exact sampling.
4. Distributions- chi square, t and F; confidence interval estimation and point estimation of parameters of analysis

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**Text Books**

- Hoel PG (1971) Introduction to Mathematical Statistics. John Wiley.
- S. P. Gupta (2014) Statistical Methods 43rd Edition, Publisher: Sultan Chand, New Delhi.

**Suggested readings**

- Anderson TW (1958) An Introduction to Multivariate Statistical Analysis. John Wiley.
- Hoel PG (1971) Introduction to Mathematical Statistics. John Wiley.

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**ECONNC-101 : LIBRARY AND INFORMATION SERVICES**

**0+1**

**Objective**

To equip the library users with skills to trace information from libraries efficiently, to apprise them of information and knowledge resources, to carry out literature survey, to formulate information search strategies, and to use modern tools (Internet, OPAC, search engines etc.) of information search.

**Program Outcome**

After completing the course, the students will be equipped with skills to trace information from libraries efficiently, to apprise them of information and knowledge resources, to carry out literature survey, to formulate information search strategies, and to use modern tools (Internet, OPAC, search engines etc.) of information search.

**UNIT I**

To equip the library users with skills to trace information from libraries efficiently.

**UNIT II**

To apprise them of information and knowledge resources, to carry out literature survey.

**UNIT III**

To formulate information search strategies.

**UNIT IV**

To use modern tools (Internet, OPAC, search engines etc.) of information search.

**Practical**

1. Introduction to library and its services
2. Role of libraries in education, research and technology transfer; Classification systems and organization of library; Sources of information- Primary Sources.
3. Secondary Sources and Tertiary Sources; Intricacies of abstracting and indexing services (Science Citation Index, Biological Abstracts, Chemical Abstracts, CABI Abstracts, etc.).
4. Tracing information from reference sources; Literature survey; Citation techniques/Preparation of bibliography; Use of CD-ROM Databases.
5. Online Public Access Catalogue and other computerized library services.
6. Use of Internet including search engines and its resources; access methods.

**Text Books**

- Katz, William A. 2001. Introduction to Reference Work. 2 vols. New York: McGraw-Hill.

**Suggested Readings**

- Bunge, Charles A. 1999. "Ethics and the Reference Librarian." The Reference Librarian, no. 66: 25-33.
- Connaway, Lynn S., and Marie L. Radford. 2011.
- Dublin, OH: OCLC Research. [www.oclc.org/en/reports/synchronicity.html](http://www.oclc.org/en/reports/synchronicity.html). Genz, Marcella D. 1998. "Working the Reference Desk." Library Trends 46, no. 3 (Winter): 505-525.

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- Herson, Peter, Ellen Altman, and Robert E. Dugan. 2015. Assessing Service Quality: Satisfying the
- Expectations of Library Customers. 3rd ed. Chicago: American Library Association.
- Radford, Marie L. 1999. The Reference Encounter: Interpersonal Communication in the Academic Library. Chicago: Association of College and Research Libraries.

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**ECONNC-102: BASIC CONCEPTS IN LABORATORY TECHNIQUES 0+1****Objective**

To acquaint the students about the basics of commonly used techniques in laboratory.

**Program Outcome**

After completing the course, the students will be able to know about the basics of commonly used techniques in laboratory.

**Theory****UNIT I**

Safety measures while in Lab. Handling of chemical substances; Use of burettes, pipettes, measuring cylinders, flasks, separatory funnel, condensers, micropipettes and vaccumeters; washing, drying and sterilization of glassware.

Drying of solvents/chemicals.

**UNIT II**

Weighing and preparation of solutions of different strengths and their dilution; Handling techniques of solutions; Preparation of different agro-chemical doses in field and pot applications; Preparation of solutions of acids; Neutralisation of acid and bases; Preparation of buffers of different strengths and pH values.

**UNIT III**

Use and handling of microscope, laminar flow, vacuum pumps, viscometer, thermometer, magnetic stirrer, micro-ovens, incubators, sandbath, waterbath, oilbath; Electric wiring and earthing.

**UNIT IV**

Preparation of media and methods of sterilization; Seed viability testing, testing of pollen viability; Tissue culture of crop plants; Description of flowering plants in botanical terms in relation to taxonomy.

**Practical**

1. To the study about safety measures while in Lab.
2. Handling of chemical substances.
3. Use of burettes, pipettes, measuring cylinders, flasks, separatory funnel, condensers, micropipettes and vaccumeters; washing, drying and sterilization of glassware.
4. Drying of solvents/chemicals.
5. Neutralisation of acid and bases; Preparation of buffers of different strengths and pH values. Use and handling of microscope, laminar flow, vacuum pumps, viscometer, thermometer, magnetic stirrer, micro-ovens, incubators, sandbath, waterbath, oilbath; Electric wiring and earthing. Preparation of media and methods of sterilization.
- 5 Study about Seed viability testing, testing of pollen viability.
6. Study about tissue culture of crop plants

**Text Books**

- Gabb MH & Latchem WE. 1968. A Handbook of Laboratory Solutions. Chemical Publ. Co.

**Suggested Readings**

- Furr AK. 2000. CRC Hand Book of Laboratory Safety. CRC Press.

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**ECONRES-101: Research Work**

**0+2**

The Masters in Agriculture course has 20 credits allotted for research work. In the first semester, the student will conduct trials related to his subject and collect data, this work will continue till the second year, will re-trial in the third semester and complete his thesis in the final year / iv semester. Examiners in thesis work will be appointed by University of Lucknow, Lucknow. The student's synopsis will be prepare by the student of the same subject/ minor subjects of the college and sent to the Dean/ Coordinator (Agriculture), University of Lucknow for final approval.

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**ECONMA- 201: ECONOMETRICS 2+1**

**Objective**

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

**Program Outcome**

After completing the course, the students will be able to know about the econometric tools to the students of agricultural economics as well as their applications.

**Theory**

**UNIT I**

Introduction – relationship between economic theory, mathematical economics, models and econometrics, methodology of econometrics-regression analysis.

**UNIT II**

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

**UNIT III**

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

**UNIT IV**

Use of dummy variables-limited dependent variables – specification, estimation and interpretation. Simultaneous equation models – structural equations - reduced form equations - identification and approaches to estimation.

**Practical**

1. Single equation two variable model specification and estimation
2. Hypothesis testing- transformations of functional forms and OLS application-estimation of multiple regression model - hypothesis testing - testing and correcting specification error.
3. Testing and managing Multicollinearity - testing and managing heteroscedasticity - testing and managing autocorrelation - estimation of regressions with dummy variables - estimation of regression with limited dependent variable - identification of equations in simultaneous equation systems.

**Text Book**

- Kelejans HH & Oates WE. 1994. Introduction to Econometrics Principles and Applications. Harper and Row Publ.
- Maddala GS. 1992. Introduction to Econometrics. MacMillan.

**Suggested Readings**

- Gujarati DN. 2003. Basic Econometrics. McGraw Hill.
- Johnson AG Jr., Johnson MB & Buse RC. 1990. Econometrics - Basic and Applied. MacMillan.
- Koutsoyianis A. 1997. Theory of Econometrics. Barner & Noble.
- Maddala GS. 1997. Econometrics. McGraw Hill.

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**ECONMA-202 AGRICULTURAL FINANCE AND PROJECT MANAGEMENT**

**2+1**

**Objective**

The Course Objective of the course is to impart knowledge on issues related to lending to priority sector credit management and financial risk management. The course would bring in the various appraisal techniques in project - investment of agricultural projects.

**Program Outcome**

After completing the course, the students will be able to know about various appraisal techniques in project - investment of agricultural projects.

**Theory**

**UNIT I**

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.

**UNIT II**

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 III**

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.

**UNIT IV**

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

1. Development of Rural Institutional Lending - Branch expansion, demand and supply of institutional agricultural credit and Over dues and Loan waiving.
2. An overview, Rural Lending Programmes of Commercial Banks, Lead Bank Scheme-Preparation of District Credit Plan.
3. Rural Lending Programmes of Co-operative Lending Institutions, Preparation of financial statements using farm/firm level data, Farm credit appraisal techniques and farm

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financial analysis through financial statements, Performance of Micro Financing Institutions.

4. NGO's and Self-Help Groups.

5. Identification and formulation of investment projects, Project appraisal techniques – Undiscounted Measures and their limitations. Project appraisal techniques – Discounted Measures, Network techniques – PERT and CPM for project management, Case Study .

6. 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.

**Text Books**

- Gittinger JP 1982. Economic Analysis of Agricultural Projects. The Johns Hopkins Univ. Press.

**Suggested Readings**

- Dhubashi PR. 1986. Policy and Performance - Agricultural and Rural Development in Post Independent India. Sage Publ.
- Gupta SC. 1987. Development Banking for Rural Development. Deep & Deep Publ.
- Little IMD & Mirlees JA. 1974. Project Appraisal and Planning for Developing Countries. Oxford & IBH Publ.
- Muniraj R. 1987. Farm Finance for Development. Oxford & IBH Publ.

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**ECONMA-201: RESEARCH METHODS IN BEHAVIOURAL SCIENCE  
CREDIT-3(2+1) (COMMON FOR AGRICULTURAL EXTENSION)**

**Objective**

This course is designed with a view to provide knowledge and skills in methods of behavioral sciences research and student will learn the Statistical Package for Social Sciences (SPSS) for choosing appropriate statistics for data analysis.

**Program Outcome**

After completing the course, the students will be able to know about various skills and methods of behavioral sciences research and student will learn the Statistical Package for Social Sciences ( SPSS).

**Theory**

**UNIT I**

Research – Meaning, importance, characteristics. Behavioural sciences research – Meaning, concept and problems in behavioural sciences research. Types and methods of Research – Fundamental, Applied and Action research, Exploratory, Descriptive, Diagnostic, Evaluation, Experimental, Analytical, Historical, Survey and Case Study. Review of literature – Need, Search Procedure, Sources of literature, Planning the review work. Research problem – Selection and Formulation of research problem and guiding principles in the choice of research problem, Factors and criteria in selection of research problem, statement of research problem and development of theoretical orientation of the research problem.

**UNIT II**

Objectives – Meaning, types and criteria for judging the objectives. Concept and Construct – Meaning, role of concepts in research and Conceptual frame work development in research. Variable – Meaning, types and their role in research. Definition – Meaning, characteristics of workable definitions, types and their role in research. Hypothesis – Meaning, importance and functions of hypothesis in research, Types of hypothesis, linkages, sources, problems in formulation and criteria for judging a workable hypothesis. Measurement – Meaning, postulates and levels of measurement, Use of appropriate statistics at different levels of measurement, criteria for judging the measuring instrument and importance of measurement in research. Validity – Meaning and methods of testing. Reliability – Meaning and methods of testing. Sampling – Universe, Sample and Sampling- Meaning, basis for sampling, advantages and limitations, size and factors affecting the size of the sample and sampling errors – Methods of elimination and minimizing, Maximinon Principle, Sampling – Types of sampling and sampling procedures.

**UNIT III**

Research Designs – Meaning, purpose and criteria for research design, Types, advantages and limitations of each Design Experimental design – Advantages and limitations. Data

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Collection devices - Interview – Meaning, purpose, types, techniques of interviewing and advantages and limitations. Enquiry forms and Schedules – Meaning, types of questions used, steps in construction and advantages and limitations in its use. Questionnaires – Meaning, difference between schedule and questionnaire, types of questions to be used, pre – testing of the questionnaires or schedules and advantages and limitations. Check lists – Meaning, steps in construction, advantages and limitations in its use. Rating scales – Meaning, types, limits in construction, advantages and limitations in its use. Observation – Meaning, types, tips in observation, advantages and limitations in its use. Case studies – Meaning, types, steps in conducting, advantages and limitations in its use. Social survey – Meaning, objectives, types and steps in conducting, advantages and limitations.

#### UNIT IV

Data processing – Meaning, coding, preparation of master code sheet, analysis and tabulation of data, Statistical Package for Social Sciences ( SPSS) choosing appropriate statistics for data analysis based on the level of measurement of variables. Report writing – Meaning, guidelines to be followed in scientific report writing, References in reporting.

#### Practical

1. Selection and formulation of research problem
2. Formulation of objectives and hypothesis-Selection of variables based on objectives-
3. Developing the conceptual framework of research.
4. Operationally defining the selected variables-Development of data collection devices.-
5. Testing the validity and reliability of the data collection instruments.- Pre-testing of the data collection instrument-Techniques of interviewing and collection of data using the data collection instruments-Data processing.
6. Hands on experiences on SPSS, coding, tabulation and analysis.  
Formulation of secondary tables based on objectives of research. Writing report.
7. Writing of thesis and research articles-Presentation of reports.

#### Text Books

- Ray GL & Sagar Mondal. 1999. Research methods in Social Sciences and Extension Education. Naya Prokash.

#### Suggested Readings

- Chandrakandan K, Venkatapirabu J, Sekar V & Anand Kumar V. 2000. Tests and Measurements in Social Research, APH Publ.
- Kerlinger FN. 1973. Foundations of Behavioural Research. Holt Rhinehart.
- Kothari CR. 1984. Research Methodology, Methods & Techniques. Chaitanya Pub House.
- Krishnaswami OR & Ranganatham M. 2005. Methodology of Research in Social Sciences. Himalaya Publ. House.

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- Mulay S & Sabaratnam VE. 1983. Research Methods in Extension Education. Manasavan.
- Ranjit Kumar. 1999. Research Methodology - A Step by Step Guide for Beginners. Sage Publ.
- Wilkinson TS & Bhandarkar PC. 1993. Methodology and Techniques of Social Research. Himalaya Publishing House.

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**ECOMI -201 : INTERNATIONAL TRADE**

2+1

**(Common for Agricultural Extension)****Objective**

The objective of this course is to equip the students with the knowledge on various aspects of International trade and its applications.

**Program Outcome**

After completing the course, the students will be able to know about various aspects of International trade and its applications.

**Theory****UNIT-I**

International trade-basic concepts. The theory of international trade absolute and comparative advantage, international trade equilibrium. Trade policy-protection, tariff and non-tariff measures, trade liberalization.

**UNIT-II**

WTO/GATT supply side analysis; opportunity cost; trade under increasing opportunity costs; factor endowments; trade and factor prices; factor price equalization. Demand side analysis; community indifference curves; demand & international trade. Integration of demand & supply; offer analysis; general equilibrium; equilibrium in product & factor markets

**UNIT-III**

Application of trade theory; terms of trade; supply and demand shifts; technological change; factor supplies and trade; factor intensities; transport costs, location. Trade with many goods and countries; Leontief paradox; human skills; technological gaps; the product cycle; scale economics. Trade policy protection; tariff and non-tariff measures; trade and market structure; trade liberalization; factor mobility and movement; role of multinational enterprises.

**UNIT-IV**

International finance; institutional money and credit markets; foreign exchange markets. Balance of payments analysis funds flow; capital and current account. International adjustment mechanisms; fiscal and monetary adjustments. The international monetary system; Bretton Woods to WTO. Recent developments in the international trade system. Implications for developing countries. Trade Blocks

**PRACTICAL**

1. Determination of absolute and comparative advantage.
2. Gains from trade with fixed exchange rates.
3. Estimation of terms of trade.
4. Derivation of offer curves and effects of technological change and factor supply.
5. Estimation of protection coefficients.
6. Measurement of effects of tariff imposition.
7. Effects of tariff and non-tariff barriers on domestic supply and imports.

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## 8. Preparation of BOP accounts.

**Text Books**

- Vashist AK & Singh Alka. 2003. WTO and New International Trade Regime- Implication for Indian Agriculture. Advance Publ. Concept.

**Suggestive Readings**

- Chadha GK. 2003. WTO and Indian Economy. Deep & Deep. Economic Survey of India. Ministry of Finance, Govt. of India. (various issues)
- HAU 2003. Refresher Course on Technological Interventions to Face WTO Challenges. AAREM & HRD CCS HAU Hisar.

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**ECONNC -202: DISASTER MANAGEMENT**

1+0

(e-Course)

**Objectives**

To introduce learners to the key concepts and practices of natural disaster management; to equip them to conduct thorough assessment of hazards, and risks vulnerability; and capacity building.

**Program Outcome**

After completing the course, the students will be able to know various concepts and practices of natural disaster management; and capacity building.

**Theory****UNIT I**

Natural Disasters- Meaning and nature of natural disasters, their types and effects. Floods, Drought, Cyclone, Earthquakes, Landslides, Avalanches, Volcanic eruptions, Heat and cold Waves, Climatic Change: Global warming, Sea Level rise, Ozone Depletion

**UNIT II**

Man Made Disasters- Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest fire. Oil fire, air pollution, water pollution, deforestation, Industrial wastewater pollution, road accidents, rail accidents, air accidents, sea accidents.

**UNIT III**

Disaster Management- Efforts to mitigate natural disasters at national and global levels. International Strategy for Disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements.

**UNIT IV**

Role of NGOs, Community-based organizations, and media. Central, State, District and local Administration; Armed forces in Disaster response; Disaster response: Police and other organizations.

**Practical**

1. Pollution case studies. Case Studies- Field work.
2. Visit to a local area to document environmental assets river/ forest/ grassland,
3. Visit to a local polluted site-Urban/Rural/Industrial/ Agricultural
4. Study of common plants and study of simple ecosystems-pond, river etc.

**Text Books**

- Gupta. HK. 2003. Disaster Management. Indian National Science Academy. Orient Blackswan.

**Suggested Readings**

- Hodgkinson PE & Stewart M. 1991. Coping with Catastrophe: A Handbook of Disaster Management. Routledge. Sharma VK. 2001. Disaster Management. National Centre for Disaster Management, India.

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**ECONNC-202: AGRICULTURAL RESEARCH, RESEARCH ETHICS (E-COURSE) AND RURAL DEVELOPMENT PROGRAMMES**

1+0

**Objective**

To enlighten the students about the organization and functioning of agricultural research systems at national and international levels, research ethics, and rural development programmes and policies of Government.

**Program Outcome**

After completing the course, the students will be able to know about the organization and functioning of agricultural research systems at national and international levels, research ethics, and rural development programmes and policies of Government.

**Theory**

**UNIT I**

History of agriculture in brief; Global agricultural research system: need, scope, opportunities; Role in promoting food security, reducing poverty and protecting the environment; National Agricultural Research Systems (NARS) and Regional Agricultural Research Institutions; Consultative Group on International Agricultural Research (CGIAR): International Agricultural Research Centres (IARC), partnership with NARS, role as a partner in the global agricultural research system, strengthening capacities at national and regional levels; International fellowships for scientific mobility.

**UNIT II**

Research ethics: research integrity, research safety in laboratories, welfare of animals used in research, computer ethics, standards and problems in research ethics.

**UNIT III**

Concept and connotations of rural development, rural development policies and strategies. Rural development programmes: Community Development Programme, Intensive Agricultural District Programme, Special group – Area Specific Programme.

**UNIT IV**

Integrated Rural Development Programme (IRDP), Panchayati Raj Institutions, Co-operatives, Voluntary Agencies/Non Governmental Organizations. Critical evaluation of rural development policies and programmes. Constraints in implementation of rural policies and programmes.

**Practical**

1. To the study about Global agricultural research system.
2. To the study about Regional Agricultural Research Institute.
3. Prepare reports Integrated Rural Development Programme (IRDP).
4. Visit agriculture research institute

**Suggested Readings**

- Bhalla GS & Singh G. 2001. Indian Agriculture-Four Decades of Development. Sage Pub
- Punia MS. Manual on International Research and Research Ethics. CCS, Haryana Agricultural University, Hisar.

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- Rao BSV. 2007. Rural Development Strategies and Role of Institutions - Issues, Innovations and Initiatives. Mittal Publ.
- Singh K.. 1998. Rural Development - Principles, Policies and Management. Sage Publ.

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ECONRES-201: Research Work

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Research continued.

The student's will prepare the synopsis on the same subject/ minor subjects of the college, and will be sent to the concerned Dean/ Coordinator (Agriculture) at the University of Lucknow, for final approval.

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**ECONMA- 301 LINEAR PROGRAMMING 2+1**

**Objective**

The objective of this course is to impart knowledge of Linear programming techniques.

**Program Outcome**

After completing the course, the students will be able to know about the Linear programming techniques.

**Theory**

**UNIT I**

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

**UNIT II**

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

**UNIT III**

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

**UNIT IV**

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

**Practical**

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

**Text Books**

- Doll JP & Frank O. 1978. Production Economics - Theory and Applications. John Wiley & Sons.

**Suggested Readings**

- Beattie BR & Taylor CR. 1985. The Economics of Production. John Wiley & Sons.
- Gardner BL & Rausser GC. 2001. Handbook of Agricultural Economics. Vol. I. Agricultural Production. Elsevier.
- Heady EO. Economics of Agricultural Production and Resource Use. Prentice- Hall.
- Sankayan PL. 1983. Introduction to Farm Management. Tata Mc Graw Hill.

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## ECON SS 301 AGRICULTURAL MARKETING AND PRICE ANALYSIS 2+1

### Objective

To impart adequate knowledge and analytical skills in the field of agricultural marketing issues, and enhance expertise in improving the performance of the marketing institutions and the players in marketing of agricultural commodities.

### Program Outcome

After completing the course, the students will be able to equip with the knowledge and analytical skills in the field of agricultural marketing issues, and enhance expertise in improving the performance of the marketing institutions and the players in marketing of agricultural commodities.

### Theory

#### UNIT I

Review of 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 - Structure Conduct and Performance analysis - Vertical and Horizontal integration - Integration over space, time and form-Vertical coordination.

#### UNIT II

Marketing Co-operatives – APMC Regulated Markets - Direct marketing, Contract farming and 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 III

Role of Information Technology and telecommunication in marketing of agricultural commodities - Market research-Market information service - electronic auctions (e-bay), e-Chaupals, Agmarket and Domestic and Export market Intelligence Cell (DEMIC) – Market extension. Spatial and temporal price relationship – price forecasting – time series analysis – time series models – spectral analysis. Price policy and economic development – non-price instruments.

#### UNIT IV

Theory of storage - Introduction to Commodities markets and future trading - Basics of commodity futures - Operation Mechanism of Commodity markets – Price discovery - Hedging and Basis - Fundamental analysis - Technical Analysis - Role of Government in promoting commodity trading and regulatory measures.

### Practical

1. Supply and demand elasticities in relation to problems in agricultural marketing. Price spread and marketing efficiency analysis.
2. Marketing structure analysis through concentration ratios. Performance analysis of Regulated market and marketing societies.
3. Analysis on contract farming and supply chain management of different agricultural commodities, milk and poultry products.
4. Chain Analysis - quantitative estimation of supply chain efficiency - Market Intelligence – Characters, Accessibility, and Availability Price forecasting.

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5. 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.

**Text Books**

- Singhal AK. 1986. Agricultural Marketing in India. Annual Publ., New Delhi.

**Suggested Readings**

- Purecell WD & Koontz SR. 1999. Agricultural Futures and Options: Principles and Strategies. 2nd Ed. Prentice-Hall.
- Rhodes VJ. 1978. The Agricultural Marketing System. Grid Publ., Ohio. Shepherd SG & Gene AF. 1982. Marketing Farm Products. Iowa State Univ. Press.

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**ECONSS-302 NATURAL RESOURCE AND ENVIRONMENTAL ECONOMICS**

2+1

**Objectives**

To introduce economics principles related to natural resource and environmental economics. To explore the concept of efficiency and the efficient allocation of natural resources. To understand the economics of why environmental problems occur. To explore the concept of efficiency and the efficient allocation of pollution control and pollution prevention decisions. To understand the environmental policy issues and alternative instruments of environmental policies.

**Program Outcome**

After completing the course, the students will be able to equip with the knowledge on natural resource and environmental economics.

**Theory**

**UNIT I**

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. 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 II**

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.

**UNIT III**

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 IV**

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

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**Practical**

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

**Text Books**

- Prato T. 1998. Natural Resource and Environmental Economics. Iowa State Univ. Press.
- Hackett SC. 2001. Environmental and Natural Resource Economics: Theory, Policy, and the Sustainable Society. M. E. Sharpe, Armonk, NY.

**Suggested Readings**

- Ahmad Y, El Serafy S & Lutz E. (Eds.). 1989. Environmental Accounting for Sustainable Development. World Bank.
- Freeman AM. 1993. The Measurement of Environmental and Resource Values. Resources for the Future Press, Baltimore.
- Kerr JM, Marothia DK, Katar Singh, Ramasamy C & Bentley WR. 1997. Natural Resource Economics: Theory and Applications in India. Oxford & IBH.
- Kolstad CD. 2000. Environmental Economics. Oxford Univ. Press.
- Pearce DW & Turner K. 1990. Economics of Natural Resources and the Environment. John Hopkins Univ. Press.
- Sankar U. 2001. Environmental Economics. Oxford Univ. Press.
- Sengupta R. 2000. Ecology and Economy, an Indian Perspective. Oxford Univ. Press.
- Tietenberg T. 2003. Environmental and Natural Resource Economics. 6th Ed. Addison Wesley.

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ECOSEM- 101 MASTER SEMINARS

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All P. G. agriculture students will prepare their seminar on any burning topic related to their subjects.

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**ECONNC-301: INTELLECTUAL PROPERTY AND ITS MANAGEMENT IN AGRICULTURE (E-COURSE)**

1+0

**Objective**

The main objective of this course is to equip students and stakeholders with knowledge of intellectual property rights (IPR) related protection systems, their significance and use of IPR as a tool for wealth and value creation in a knowledge based economy.

**Program Outcome**

After completing the course, the students will be equipped with the knowledge of intellectual property rights (IPR) related to protection systems, their significance and use of IPR as a tool for wealth and value creation.

**Theory**

**UNIT I**

Historical perspectives and need for the introduction of Intellectual Property Right regime; TRIPs and various provisions in TRIPS Agreement; Intellectual Property and Intellectual Property Rights (IPR), benefits of securing IPRs;

Indian Legislations for the protection of various types of Intellectual Properties; Fundamentals of patents, copyrights, geographical indications, designs and layout, trade secrets and traditional knowledge, trademarks.

**UNIT II**

Protection of plant varieties and farmers' rights and biodiversity protection Protectable subject matters, protection in biotechnology, protection of other biological materials, ownership and period of protection;

**UNIT III**

National Biodiversity protection initiatives; Convention on Biological Diversity; International Treaty on Plant Genetic Resources for Food and Agriculture

**UNIT IV**

Licensing of technologies, Material transfer agreements, Research collaboration Agreement, License Agreement.

**Practical**

1. To the study about Indian Legislations for the protection of various types of
2. Intellectual Properties.
3. Study about Licensing of technologies.
4. Write the methods of Material transfer agreements

**Text Books**

- Ganguli P. 2001. Intellectual Property Rights: Unleashing Knowledge Economy. McGraw-Hill.

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**Suggested Readings**

- Erbisch FH & Maredia K. 1998. Intellectual Property Rights in Agricultural Biotechnology. CABI.
- Intellectual Property Rights: Key to New Wealth Generation. 2001. NRDC & Aesthetic Technologies.
- Ministry of Agriculture, Government of India. 2004. State of Indian Farmer. Vol. V. Technology Generation and IPR Issues. Academic Foundation.
- Rothschild M & Scott N. (Ed.). 2003. Intellectual Property Rights in Animal Breeding and Genetics. CABI.
- Saha R. (Ed.). 2006. Intellectual Property Rights in NAM and Other Developing Countries: A Compendium on Law and Policies. Daya Publ. House.
- The Indian Acts - Patents Act, 1970 and amendments; Design Act, 2000; Trademarks Act, 1999; The Copyright Act, 1957 and amendments; Layout Design Act, 2000; PPV and FR Act 2001, and Rules 2003; National Biological Diversity Act, 2003.

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ECONRES- 301 RESEARCH

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The students of Agriculture will analyse the data, and compile the results.

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**ECONNC-401 : TECHNICAL WRITING AND COMMUNICATIONS SKILLS**

0+1

**Objective**

To equip the students/scholars with skills to write dissertations, research papers, etc. To equip the students/scholars with skills to communicate and articulate in English (verbal as well as writing).

**Program Outcome**

After completing the course, the students will be able to know about the skills to write dissertations, research papers etc.

**Theory****UNIT I**

Various forms of scientific writings- theses, technical papers, reviews, manuals, etc; Various parts of thesis and research communications (title page, authorship contents page, preface, introduction, review of literature, material and methods, experimental results and discussion)

**UNIT II**

Writing of abstracts, summaries, précis, citations etc.; commonly used abbreviations in the theses and research communications; illustrations, photographs and drawings with suitable captions; pagination, numbering of tables and illustrations; Writing of numbers and dates in scientific write-ups; Editing and proof-reading; Writing of a review article.

**UNIT III**

Grammar (Tenses, parts of speech, clauses, punctuation marks); Error analysis (Common errors); Concord; Collocation; Phonetic symbols and transcription; Accentual pattern: Weak forms in connected speech:

**UNIT IV**

Participation in group discussion: Facing an interview; presentation of scientific papers.

**Practical -**

1. Various forms of scientific writings- theses, technical papers, reviews, manuals, etc.
2. Various parts of thesis and research communications (title page, authorship contents page, preface, introduction, review of literature, material and methods, experimental results and discussion).
3. Methods writing of abstracts, summaries, précis, citations etc.; commonly used abbreviations in the theses and research communications; illustrations, photographs and drawings with suitable captions; pagination, numbering of tables and illustrations
4. Writing of numbers and dates in scientific write-ups; Editing and proof-reading; Writing of a review article.

Communication Skills - Grammar (Tenses, parts of speech, clauses, punctuation marks); To the study about Error analysis (Common errors). Concord; Collocation; Phonetic symbols and transcription; Accentual pattern: Weak forms in connected speech: Participation in group discussion: Facing an interview; presentation of scientific papers.

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**Text Books**

- James HS. 1994. Handbook for Technical Writing. NTC Business Books.

**Suggested Readings**

- Chicago Manual of Style. 14th Ed. 1996. Prentice Hall of India. Collins' Cobuild English Dictionary. 1995. Harper Collins.
- Gordon HM & Walter JA. 1970. Technical Writing. 3rd Ed. Holt, Rinehart & Winston.
- Hornby AS. 2000. Comp. Oxford Advanced Learner's Dictionary of Current English. 6th Ed. Oxford University Press.
- Joseph G. 2000. MLA Handbook for Writers of Research Papers. 5th Ed. Affiliated East-West Press.
- Mohan K. 2005. Speaking English Effectively. MacMillan India. Richard WS. 1969. Technical Writing. Barnes & Noble.
- Robert C. (Ed.). 2005. Spoken English: Flourish Your Language. Abhishek.
- Sethi J & Dhamija PV. 2004. Course in Phonetics and Spoken English. 2nd Ed. Prentice Hall of India.
- Wren PC & Martin H. 2006. High School English Grammar and Composition. S. Chand & Co.

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**ECONRES-401: RESEARCH WORK, RESEARCH REPORT AND VIVA-VOCE**

0+8

In the fourth semester of Masters Agriculture programme, the student will complete his research work and write the thesis and submit it to the college. The college will send the thesis to the Controller of Examinations, University of Lucknow, Lucknow for evaluation.

Further, in the IV semester; there will be oral viva- voce of the students by the examiners.

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