

**Course Curriculum of Fourth Semester as per the
ICAR-Sixth Deans' Committee Report for Academic Programmes in
AGRI-BUSINESS MANAGEMENT**

Course Layout

B.Sc. (Hons.) Agri-Business Management

Semester: IV (New)

w.e.f. Academic Year: 2025-26

Sr. No.	Course No.	Course Title	Credit Hrs.	Remark
1.	VAC-242	Agricultural Informatics and Artificial Intelligence	3(2+1)	-
2.	MDC-243	Entrepreneurship Development and Business Management	3(2+1)	-
3.	ABM-244	Business Laws and Ethics	2(2+0)	-
4.	ABM-245	Principles of Management and Organizational Behaviour	2(1+1)	-
5.	ECON-244	International Trade and Policy in Agriculture	2(2+0)	-
6.	MKT-243	Agricultural Marketing Regulations	3(2+1)	-
7.	ENGG-242	Farm Machinery and Power & Custom Hiring Services	2(1+1)	-
8.	HORT-242	Post-harvest Management and Value Addition of Fruits and Vegetables	2(1+1)	-
9.	SEC-246	Skill Enhancement Course-VI [#] (To be offered from bouquet of SEC Courses)	2(0+2)	-
10.	OC-1/ OC-2/..	Online Course(s)/ MOOCs [†]	As opted by student	NG
Total Credits Hrs.=			21(13+8)	G
VAC: Value Added Course, MDC: Multidisciplinary Course, SEC: Skill Enhancement Course, OC: Online Course; G: Gradual; NG: Non-gradual				
[†] Note: It is mandatory for each Student to complete total 10 credits (Non-gradual) of Online Courses from available resources across III to VIII semesters under the guidance of assigned Faculty/Advisor.				
Post-IV Semester (Only for exit option with UG-Diploma in Agri-Business Management)				
11.	INT-242	Internship (10-week)	10 (0+10)	NG

[CLICK HERE to Join AgroMind Telegram Channel](#)

B.Sc.(Hons.) Agri-Business Management- Fourth Semester

Course-wise Syllabus with Teaching Schedules

Semester	: IV	
Course No.	: VAC-242	Credit Hrs. : 3(2+1)
Course Title	: Agricultural Informatics and Artificial Intelligence	
Gradual Common Course across 8 UG degrees viz., B.Sc. (Hons.) Agriculture, B.Sc. (Hons.) Horticulture, B.Tech. (Biotechnology), B.Tech. (Food Technology), B.Sc. (Hons.) Agri. Business Management, B.Sc. (Hons.) Forestry, B.F.Sc. (Hons.) and B.Sc. (Hons.) Community Science		

SYLLABUS

- Objectives :**
- (i) To acquaint students with the basics of computer applications in Agriculture, multimedia, database management, application of mobile app and decision-making processes etc.
 - (ii) To provide basic knowledge of computer with applications in Agriculture.
 - (iii) To make the students familiar with Agricultural-Informatics, its components and applications in Agriculture and Artificial Intelligence.

THEORY

Introduction to Computers, Anatomy of Computers, Memory Concepts, Units of Memory, Operating System: Definition and types, Applications of MS-Office® for creating, Editing and Formatting a document, Data presentation, Tabulation and graph creation, Statistical analysis, Mathematical expressions, Database- concepts and types, creating database, Uses of DBMS in Agriculture, Internet and World Wide Web (WWW): Concepts and components. Computer programming: General concepts, Introduction to general programming concepts and standard input/output operations. e-Agriculture, Concepts, Design and Development; Application of innovative ways to use Information and Communication technologies (IT) in Agriculture, Computer Models in Agriculture: Statistical, Weather analysis and Crop simulation models, Concepts, Input-Output files, Limitation, Advantages and Application of models for understanding plant processes, Sensitivity, Verification, Calibration and Validation, IT applications for Computation of water and Nutrient requirement of crops, Computer-controlled devices (automated systems) for Agri-input management, Smartphone mobile apps in

Agriculture for farm advice: Market price, Post-harvest Management etc. Geospatial technology: Techniques, Components and Uses for generating valuable agri-information, Decision Support Systems: Concepts, Components and Applications in Agriculture. Agriculture Expert System: Soil Information Systems etc. for supporting farm decisions. Preparation of Contingent Crop Planning and Crop calendars using IT tools, Digital India and Schemes to promote digitalization of Agriculture in India. Introduction to Artificial Intelligence, Background and Applications, Turing test. Control strategies, Breadth-first search, Depth-first search, Heuristics search techniques: Best-first search, A*algorithm, IoT and Big Data; Use of AI in Agriculture for Autonomous Crop Management and Health, Monitoring Livestock Health, Intelligent Pesticide Application, Yield Mapping and Predictive Analysis, Automatic Weeding and Harvesting, Sorting of produce and Other Food Processing Applications; Concepts of Smart Agriculture, Use of AI in Food and Nutrition Science etc.

PRACTICAL

Study of computer components, accessories, practice of important DoS Commands, Introduction of different operating systems such as Windows, Unix/ Linux, creating files and folders, File Management. Use of MS-WORD and MS-Power Point for creating, editing and presenting a scientific document, MS-EXCEL - Creating a spreadsheet, Use of statistical tools, Writing expressions, Creating graphs, Analysis of scientific data. MS-ACCESS: Creating Database, Preparing queries and Reports, Demonstration of Agri-information system, Introduction to World Wide Web (WWW) and its components, Introduction of programming languages such as - Visual Basic, Java, Fortran, C, C++, Hands-on practice on Crop Simulation Models (CSM), DSSAT/Crop-Info/Crop Syst/Wofost, Preparation of inputs file for CSM and Study of model outputs, Computation of water and Nutrient requirements of crop using CSM and IT tools, Use of smart phones and Other devices in agro-advisory and Dissemination of market information, Introduction of Geospatial Technology, AR/ VR demonstration, India Digital Ecosystem of Agriculture (IDEA).

TEACHING SCHEDULE**THEORY [VAC-242]**

Lecture No.	Topic	Sub-topics/ Key Points	Weightage (%)
1 - 3	Introduction to Computers, Anatomy of Computers Memory Concepts: Operating System:	Definitions; Characteristics of Computer; Components of Computer; CPU: CU, ALU, MU; Input Devices; Output Devices; Units of Memory: bit to TB, Types: Primary, Secondary; Definitions and Types: Single user, Multi-user and features. OS Special Types (Brief Overview): Batch, Real-Time, Time Sharing, Distributed, Network OS. Functions of operating system	7
4 - 6	Applications of MS Office®	MS Word: Creating a New Document, Formatting option features; Insertion of Table; MS Excel: Creating worksheet and graph, Functions for Data Analysis: AVERAGE, COUNT, SUM, MIN, MAX, MEDIAN, MODE, STDEV, STDEVP, VAR, VARP, CORREL, PERCENTILE; Mathematical functions in MS-Excel: SUM, AVERAGE, AVERAGEIF, COUNT, COUNTIF, MOD, ROUND	7
7 - 9	Database and DBMS	Database: Definitions, Concepts and Types; Uses of DBMS in Agriculture; Characteristics of Database; Structure of Database Management System, Tables: Concept of view, Primary key, Foreign key; Creating Database: SQL query: Create, Insert, Select, Delete, Update. Form: Steps for Creating Forms, Entering Data in forms, Report using MS-ACCESS: Steps for Creating Reports, Printing reports.	7

Continued...

10	Internet and World Wide Web (www)	Concepts and components; Internet: Introduction; Definition of LAN, WAN, MAN and Internet Internet Service Provider (ISP); World Wide Web; Hypertext; Web Browser; Web Page and Websites; E-Mail: Creating Email, Email Addresses, Using Email, Sending the message, CC and BCC; Search Engine	7
11 - 12	Introduction to Computer Programming	Computer Programming: Introduction, General concepts, Standard input/output operations.	7
13 - 14	e-Agriculture	Concepts, Application & Importance of IT in e-Agriculture; AGRINET: Introduction, Objectives; Advantages and Challenges in Agriculture.	7
15 - 16	Computer Models in Agriculture	Statistical, Weather Analysis and Crop Simulation Models; Concepts, Input-output files, Limitation, Advantages and Application of models for understanding plant processes, Sensitivity, Verification, Calibration and Validation	7
17 - 19	IT and IoT Applications in Agriculture	IT Applications & their role in Agriculture with emphasis on Computation of Water and Nutrient Requirement of Crop; IoT - Definition, Benefits/ Applications/ Uses in Agriculture: Precision Farming, Agricultural Drones, Smart Greenhouses, Drones; Challenges.	7

Continued...

20 - 21	Computer-controlled Devices; Smartphone Apps and Geospatial Technology	Computer- controlled Devices (Automated systems) for Agri-input management- Examples of Automation Devices: Robotics Application in Planting, Drones for Irrigation, Harvest Automation Tools, Automated Tractors etc., AWS - Automatic Weather Station, AIS - Automatic Irrigation System. Smartphone Mobile Apps in Agriculture- Introduction- Irrigation Systems, Fertilizer Application, Pest and Disease Management; Seeding and Planting, Harvesting Systems; Weather Forecasting, Soil Testing and Analysis, Crop Management, Market Prices; Farm Management, Financial & Insurance Services. Geospatial Technology (<i>in brief</i>) – Introduction, Techniques, Components and Uses for generating valuable agri-information.	7
22 - 23	Decision Support System (DSS)	DSS: Introduction, Concepts, Components, Types and Applications in Agriculture.	7
24 - 25	Agriculture Expert System (AES)	AES: Introduction, Concepts, Components and Applications in Agriculture- Soil Information Systems for supporting farm decisions.	7
26 - 27	Contingent Crop Planning using IT Tools	Preparation of Contingent Crop Planning and Crop Calendars: Introduction, Definition, Benefits, Steps to prepare Contingent Crop Planning and Calendars using IT Tools.	7
28 - 30	Digital India and Schemes to promote Digitalization of Agriculture in India	Digital India and Schemes to promote Digitalization of Agriculture in India; Digital Agriculture in India: Status, Challenge, Digital India and Initiatives in Agriculture Sector. Digital Agriculture or NeGP-A 2.0	8
31 - 32	Introduction to and Uses of Artificial Intelligence (Overview)	Introduction to Artificial Intelligence, Background and Applications, Turing test. Control strategies, Breadth-first search, Depth-first search, Heuristics search techniques: Best-first search, A*algorithm, IoT and Big Data; Use of AI in Agriculture for autonomous crop management and health, monitoring livestock health, Intelligent pesticide application, Yield mapping and Predictive analysis, Automatic Weeding and Harvesting, Sorting of produce and Other food processing applications; Concepts of Smart Agriculture, Use of AI in Food and Nutrition Science etc.	8
Total =			100

TEACHING SCHEDULE

PRACTICAL [VAC-242]

Exercise No.	Exercise Title
1 - 2	Study of computer components, accessories, practice of important DOS command Introduction to different Operating systems- such as Windows, Unix/ Linux; Creating files and folders, Files Management.
3 - 4	Use of ~ MS-WORD: Creating files and folders; Files management and MS-POWERPOINT: Presentation for creating, editing and presenting scientific documents. MS-EXCEL: Mathematical calculations; Preparation of Spread sheets; Use of statistical tools; Writing expressions; Creating graphs; Analysis of scientific data.
5	MS-ACCESS: Creating Database; Preparing queries and reports.
6	Demonstration of Agri-information system(s)
7 - 8	Introduction of Programming Languages & Program in C-Language: a) Program to enter name and print name b) Program to calculate sum and subtraction of numbers c) Program to calculate Area of Circle d) Program to calculate Area of Triangle e) Program to calculate Area of Rectangle
9	Introduction to Internet, World Wide Web (WWW) and its components.
10 - 11	Hands-on Practice on Crop Simulation Models (CSM): CROPWAT 8.0/ DSSAT/ Crop-Info/ CropSyst/ Wofost/ etc. Computation of water and nutrient requirements of crop using CSM and IT tools.
12	Use of Smartphone Apps (developed by SAUs) and other devices in agro-advisory and dissemination of market information
13	Introduction to Geospatial Technology (Use of Open-source GIS Tools)
14	Study/ Demonstration of general AR/VR tools (as available)
15	Hands-on Practice on Decision Support System (DSS);
16	Introduction to India Digital Ecosystem of Agriculture (IDEA)

Suggested Readings [VAC-242]:

1. Fundamentals of Computer by V. Rajaraman, PHI Learning.
2. Introduction to Information Technology by Pearson.
3. Introduction to Database Management System by C.J. Date, Pearson Education, N. Delhi.
4. Concepts and Techniques of Programming in C by Dhabal Prasad Sethi and Manoranjan, Wiley India.
5. Introductory Agri Informatics by Mahapatra, Subrat K. *et al.*, Jain Brothers Publication.
6. Russell, Stuart, Artificial Intelligence: A Modern Approach, Pearson Edition 2013.
7. Nilson N.J. 2001. Principles of Artificial Intelligence. Narosa Publ.
8. Agricultural Informatics and Artificial Intelligence for B.Tech.(Agril Technology) by Prashant Publ.

➤ **Online Resources: (VAC-242)**

- <https://en.wikipedia.org/wiki/Computer>
- <https://www.javatpoint.com/computer>
- <https://iasri.icar.gov.in/>
- https://www.nrsc.gov.in/EO_Agr_Objective?language_content_entity=en
- <https://www.agrimoon.com>
- <https://www.agriinfo.in>
- <https://eagri.org>
- <https://www.agriglance.com>
- <https://agritech.tnau.ac.in>
- https://loksabhadocs.nic.in/Refinput/New_Reference_Notes/English/Agriculture_and_Digital_India.pdf
- <https://www.investindia.gov.in/team-india-blogs/digitalisation-agriculture-india>
- <http://courseware.cutm.ac.in/wp-content/uploads/2020/06/Session-11-Preparation-of-Contingent-Crop-Planning-and-Crop-Calendars-Using-IT-Tools.pdf>
- <https://optimizeias.com/indias-digital-ecosystem-for-agriculture/>
- <https://www.igi-global.com/chapter/introduction-to-agricultural-information-systems/266572#:~:text=Agricultural%20Information%20Systems%3A%20Information%20system,knowledge%20utilization%20by%20agricultural%20producers.>
- <https://cropcalendar.apps.fao.org/#/home>
- http://www.irdindia.in/journal_ijrdmr/pdf/vol4_iss1/7.pdf
- <https://learn.microsoft.com/en-us/office365/servicedescriptions/office-applications-service-description/office-applications>
- <https://ebooks.inflibnet.ac.in/hsp16/chapter/application-of-software-in-statisticalanalysis-i-microsoft-excel/>
- <http://eagri.org/eagri50/STAM102/index.html>
- <https://edu.gcglobal.org/en/internetbasics/using-a-web-browser/1/>
- <https://www.javatpoint.com/what-is-world-wide-web>
- https://www.mdpi.com/journal/agriculture/special_issues/Decision_Support_Systems_Application
- <https://apps.gov.in/ministry/ministry-agriculture>
- <http://courseware.cutm.ac.in/wp-content/uploads/2020/06/Session-11-Preparation-of-Contingent-Crop-Planning-and-Crop-Calendars-Using-IT-Tools.pdf>
- https://apps.mgov.gov.in/apps_by_category.jsessionid=8206D0DAE69F48FB50962462A8922C23?name=Agriculture

➤ **Tools available for Student for Academic Purpose only: (VAC-242)**

1. DSSAT (Decision Support System for Agrotechnology Transfer)
 - Purpose: A comprehensive crop modeling tool.
 - Use: Simulates plant growth, development, and yield for various crops under different management and environmental conditions.
 - Download: <https://dssat.net/>
2. APSIM (Agricultural Production Systems Simulator)
 - Purpose: A powerful plant simulation tool.
 - Use: Models the effects of environmental variables like soil, climate, and management strategies on plant growth and crop yield.
 - Download: <https://www.apsim.info/>
3. Open Sim Root
 - Purpose: A root growth modeling software.
 - Use: Helps understand plant root growth processes, interactions with soil, and how they respond to environmental conditions.
 - Download: Available as open-source software via research platforms like Git Hub.
<https://gitlab.com/rootmodels/OpenSimRoot>
4. Virtual Plant
 - Purpose: A tool for visualizing and modeling plant metabolic and regulatory networks.
 - Use: Helps in understanding complex plant processes such as gene regulation, metabolic pathways, and how they respond to environmental conditions.
Download: <https://sourceforge.net/projects/virtualplant/>
5. R Studio (with Bioconductor and Plant Modeling Libraries)
 - Purpose: A programming environment for statistical computing.
 - Use: Using plant modeling libraries like plant and photosynthesis, researchers can model plant growth, carbon assimilation, and nutrient cycling.
 - Download: <https://posit.co/downloads/>
6. WOFOST (World Food Studies)
 - Purpose: A plant process and crop growth simulation model developed by the FAO.
 - Use: Helps in understanding crop development, photosynthesis, and biomass accumulation under different environmental and management conditions.
 - Download: <https://www.wur.nl/en/research-results/research-institutes/environmental-research/facilities-tools/software-models-and-databases/wofost/downloads-wofost.htm>
7. Green Lab
 - Purpose: A plant growth model focused on plant architecture and functional growth processes.
 - Use: Simulates plant organ development and growth processes, integrating functional and structural aspects of plant behavior.
 - Download: https://greenlab.cirad.fr/GLUVED/html/P3_Tools/Tool_simul_003.html

Semester : IV		
Course No. : MDC-243	Credit Hrs. : 3(2+1)	
Course Title : Entrepreneurship Development and Business Management		
Gradual Common Course across 4 UG degrees viz., B.Sc. (Hons.) Agriculture, B.Tech. (Agricultural Engineering), B.Tech. (Food Technology) and B.Sc. (Hons.) Agri-Business Management		

SYLLABUS

Objectives:

- To provide an insight into the concept and scope of entrepreneurship,
- To expose the student to various aspects of establishment and management of a small business unit,
- To enable the student to develop financially viable agribusiness proposal.

THEORY

Development of entrepreneurship, Motivational factors, Social factors, Environmental factors, Characteristics of entrepreneurs, Entrepreneurial attributes/ Competencies. Concept, need for and Importance of entrepreneurial development. Evolution of entrepreneurship, Objectives of entrepreneurial activities, Types of entrepreneurs, Functions of entrepreneurs, Importance of entrepreneurial development and Process of entrepreneurship development. Environment scanning and opportunity identification need for scanning - Spotting of opportunity - Scanning of environment - Identification of product/ service - Starting a project; Factors influencing sensing the opportunities. Infrastructure and Support systems - Good policies, Schemes for entrepreneurship development; Role of financial institutions and other agencies in entrepreneurship development. Steps involved in functioning of an enterprise. Selection of the product / Services, Selection of form of ownership; Registration, Selection of site, Capital sources, Acquisition of manufacturing know how, Packaging and Distribution. Planning of an enterprise, Project Identification, Selection and Formulation of project; Project report preparation, Enterprise management. Production management - Product, Levels of products, Product mix, Quality control, Cost of production, Production controls, Material management. Production management - Raw material costing, Inventory control. Personal management - Man power Planning, Labour turn over, Wages / Salaries. Financial Management / Accounting - Funds, Fixed capital and Working capital, Costing and Pricing, Long term planning and Short-Term Planning, Book Keeping, Journal, Ledger, Subsidiary books, Annual financial statement and Taxation. Marketing management- Market, Types, Marketing assistance, Market strategies. Crisis management - Raw material, Production, Leadership, Market, Finance, Natural etc.

PRACTICAL

Visit to small scale industries / Agro-industries, Interaction with successful entrepreneurs / agric-entrepreneurs. Visit to financial institutions and support agencies. Preparation of project proposal for funding by different agencies.

TEACHING SCHEDULE

THEORY [MDC-243]

Lecture No.	Topic	Sub-topics/ Key Points	Weightage (%)
1	Introduction to Entrepreneurship	Meaning and Definitions of an Entrepreneur, Entrepreneurship; Concept & Scope of Entrepreneurship	6
2	Importance of Entrepreneurship	Importance of Entrepreneurship in Agribusiness	
3	Entrepreneurship Development	Need for and objectives of Entrepreneurial development	4
4	Motivational Factors	Types of motivational factors, Role of social and environmental factors in entrepreneurship	4
5	Characteristics of Entrepreneurs	Characteristics, Entrepreneurial attributes and Competencies	4
6	Types of Entrepreneurs	Various types and their significance	4
7	Functions of Entrepreneurs	Key roles and Responsibilities	2
8	Evolution of Entrepreneurship	Historical perspective and Growth	3
9	Process of Entrepreneurship Development	Stages and Approaches in developing entrepreneurship	4
10	Environmental Scanning	Need for scanning, Techniques	2
11	Opportunity Identification	Spotting and Analysing opportunities	2
12	Infrastructure and Support Systems	Policies, Schemes and Role of financial and other agencies in entrepreneurship development	4
13	Enterprise Functioning Steps	Steps to establish an enterprise	4
14	Selection of Products/Services	Choosing products, Services and Business forms	3
15	Enterprise Location and Capital Sources	Registration, Site selection, Capital sources/Acquisition	3
16	Manufacturing and Distribution	Acquiring manufacturing know-how, Packaging and Distribution essentials	3
17	Planning of an Enterprise	Short term and Long-term planning of an enterprise	3
18 - 19	Project Formulation	Project identification, Selection, Steps in project formulation and Report preparation, etc.	8
20	Enterprise Management	Basics and Importance of managing an enterprise	3

Continued....

21	Production Management	Product types, Levels of products, Product mix, Quality control, Cost of production, Production control	4
22	Material Management	Raw material costing and Inventory control strategies	4
23	Personnel Management/Human Resource Management	Manpower planning, Labour turnover, Wages/Salaries	4
24	Financial Management	Funds, Fixed and Working capital, Costing, Pricing, Book-keeping basics	4
25 - 26	Accounting and Taxation	Journals, Ledgers, Subsidiary books, Annual financial statements, Taxation basics	4
27	Marketing Management	Market, Types of markets, Marketing assistance	4
28 - 29	Market Strategies and Pricing	Marketing strategies, Pricing strategies and Market penetration	4
30	Crisis Management	Crisis types, Strategies for managing raw material, etc.	2
31	Leadership in Crisis Situations	Role of leadership in handling crises	2
32	Financial Crises and Solutions	Strategies for financial crisis management	2
Total=			100

TEACHING SCHEDULE

PRACTICAL [MDC-243]

Exercise No.	Exercise Topic/Title
1	Visit to Small-Scale Industries/Agro-Industries. (Objective: To understand setup and operations of small-scale units)
2	Interaction with Successful Entrepreneurs. (Objective: To gain insights from real-life entrepreneurial experiences)
3	Case Study on Agro-Entrepreneurs. (Objective: To analyse successful agribusiness ventures)
4	Visit to Financial Institutions. (Objective: To learn about funding options and financial support)
5	Identification of Agribusiness Ideas. (Objective: To identify viable agribusiness ideas based on demand)
6	Analysing Project Proposals. (Objective: To study structure and elements of project proposals)

Continued...

7	Preparing a Project Proposal. (Objective: To develop a basic proposal for an agribusiness venture)
8	Project Report Writing Techniques. (Objective: To practice format and structure for project reports)
9	Marketing Strategies Case Study. (Objective: To analyse effective marketing strategies in agribusiness)
10	Production and Cost Control Analysis (Objective: To study basic cost control measures in production)
11	Inventory Control Simulation (Objective: To apply inventory management methods in a hypothetical setup)
12	Basic Bookkeeping (Objective: To practice fundamental bookkeeping for small businesses)
13	Market Research Techniques (Objective: To use surveys and questionnaires for market insights)
14	Project Proposal Presentation (Objective: To present project ideas for feedback)
15	Review of Project Proposal (Objective: To refine project proposals based on feedback)
16	Final Evaluation of Proposals (Objective: To assess and finalize projects)

Suggested Readings [MDC-243]:

1. **Charantimath P.M. 2009.** Entrepreneurship Development and Small Business Enterprises. Pearson Publications, New Delhi.
2. **Desai V. 2015.** Entrepreneurship: Development and Management, Himalaya Publishing House.
3. **Desai Vasant. 1997.** Small Scale Industries and Entrepreneurship. Himalaya Publ. House.
4. **Gupta C.B. 2001.** Management Theory and Practice. Sultan Chand and Sons.
5. **Indu Grover. 2008.** Handbook on Empowerment and Entrepreneurship. Agrotech Public Academy.
6. **Khanka S.S. 1999.** Entrepreneurial Development. S. Chand and Co.
7. **Mehra P. 2016.** Business Communication for Managers. Pearson India, New Delhi.
8. **Pandey M. and Tewari D.2010.** The Agribusiness Book. IBDC Publishers, Lucknow.
9. **Singh D. 1995.** Effective Managerial Leadership. Deep and Deep Publ.
10. **Singhal R.K.2013.** Entrepreneurship Development and Management, Katson Books.
11. **Tripathi P.C and Reddy P.N.1991.** Principles of Management. Tata McGraw Hill.

Semester	: IV	
Course No.	: ABM-244	Credit Hrs. : 2(2+0)
Course Title	: Business Laws and Ethics	

SYLLABUS

- Objectives :**
- (i) To understand the legal framework governing business operations and transactions.
 - (ii) To learn about ethical principles and practices in business decision-making and conduct.
 - (iii) To explore the implications of business laws and ethics on organizational behaviour, corporate governance and social responsibility.
 - (iv) To develop skills to navigate legal and ethical challenges, ensuring compliance and fostering trust in business relationships.

THEORY

Introduction to Indian legal system: Legislative Powers of the States and the Union. Scope and Importance of Business laws. Contracts - Meaning, Significance, Types and Essentials of a valid contract. The Indian Contract Act, 1872. The Indian Partnership Act, 1932 - General Nature, Registration of Partnership, Partnership Deed, Types of Partners, Rights and Duties of Partners. The Companies Act, 1956 and 2013- General Nature, Types of companies, Incorporation of a Company, Memorandum of Association and Articles of Association, management of a company. Provisions of important Acts enacted over time related to business environment: Industries (Regulation and Development) Act, 1951; Income Tax Act, 1961. Central Excise Act, 1944; Foreign Exchange Regulation Act (FERA), 1973; Foreign Exchange Management Act (FEMA), 1999; Monopolistic and Restrictive Trade Practices (MRTP), Act, 1969; Competition Act, 2002; Food Safety and Standards Act, 2006; Customs Act, 1962 and Goods and Service Tax, 2011. FDI Policy of GoI. Business Ethics - Nature and importance of ethics and moral standards. Scope of business ethics in business functional area. Governance mechanism. Companies Act Amendment 2023, OPC, FPC, Section 8.

Suggested Readings [ABM-244]:

1. Business Law and Ethics - Concepts, Methodologies, Tools and Applications 2015. Editor: Information Resources Management Association.
2. Business Law and Ethics: Concepts, Methodologies, Tools and Applications.
3. Business Law and Ethics: Concepts, Methodologies, Tools and Applications. Volume 1. Business Science Reference, 2015.

TEACHING SCHEDULE

THEORY [ABM-244]

Lecture No.	Topic	Sub-topics / Key Points	Weightage (%)
1 - 2	Introduction to Indian Legal System	Legislative Powers of the States and the Union	7
3	Business Laws & Ethics	Scope and Importance	5
4 - 5	Contracts, The Indian Contract Act	Meaning, Significance, Types and Essentials of a valid contract under Indian Contract Act, 1872	7
6 - 7	The Indian Partnership Act	General Nature, Registration of Partnership, Partnership Deed, Types of Partners, Rights and Duties of Partners under Indian Partnership Act, 1932	7
8 - 9	The Companies Act, 1956 and 2013	General Nature, Types of companies, incorporation of a Company, Memorandum of Association and Articles of Association, Management of a company of Companies Act, 1956 and 2013	10
10 - 11	Provisions of Important Acts	Enacted overtime related to business environment: Industries (Regulation & Development) Act, 1951;	5
12 - 13	Income Tax Act	Rules for Taxation, Assessment and Collection of Income Tax Act, 1961	5
14 - 15	Central Excise Act	Collection of Excise Duties, Levy and Collection of excise duties of Central Excise Act, 1944.	5
16 - 17	Foreign Exchange Regulation Act (FERA)	Objectives and Key provisions of FERA, 1973	5
18 - 19	Foreign Exchange Management Act (FEMA)	Objectives and Key provisions of FEMA, 1999	5
20 - 21	Monopolistic and Restrictive Trade Practices (MRTP) Act	Aims and Monopolistic, Restrictive and Unfair Trade Practices of MRTP Act, 1969	5
22 - 23	Competition Act	Objectives and Key features Competition Act, 2002	5
24 - 25	Food Safety and Standards Act	Objectives and Importance Food Safety and Standards Act, 2006	5
26 - 27	Customs Act	Levy and Collection of duty on import and export of goods of Customs Act, 1962	5
28 - 29	Goods and Service Tax	Introductions of subsumed taxes in India under GST Act, 2011	7
30	FDI Policy of GoI.	Policy details and recent reforms	5
31 - 32	Business Ethics Section 8.	Nature and importance of ethics and moral standards. Governance mechanism. Companies Act Amendment 2023, OPC, FPC.	7
Total =			100

Semester	: IV	
Course No.	: ABM-245	Credit Hrs. : 2(1+1)
Course Title	: Principles of Management and Organizational Behaviour	

SYLLABUS

- Objectives :**
- (i) To understand the fundamental principles of management theory and practice.
 - (ii) To explore the dynamics of organizational behaviour, including individual and group dynamic, communication and motivation.
 - (iii) To learn to apply management concept and behavioural theories to solve organizational challenges and improve effectiveness.
 - (iv) To develop skills in leadership, decision-making and conflict resolution to enhance organizational performance and employee satisfaction.

THEORY

Introduction to Management - Management functions - Management Levels - Managerial roles- Management skills - Role of management. Evolution of management thought.

Functions of management: Planning: Nature and importance- Types of planning - Steps in planning - Decision making - Meaning - Types of decisions.

Organizing - Meaning - Nature and Purpose of organizing - Principles of organizing - Organization structure - Managing Human Resources- Human Resource Planning - Recruitment- Sources of recruitment - Selection - Steps in the selection process - Orientation - Training - Management development programmes.

Leading - Meaning - Leadership theories - Motivation - Meaning and purpose - Motivational Theories - Communication - Meaning - Objectives - Importance - Types - Barriers.

Controlling - Meaning and Nature of controlling - Essential elements of controlling. Ethics and Corporate social responsibility in business.

Organizational Behaviour - Definition, Importance, Historical background of Organizational Behaviour, Challenges - The organizational context - Environment - Technology.

Learning - Importance of learning - Process - Approaches to learning - The learning organization. Personality - Defining personality - Types and Traits - Personality types - The big five - The development of self - Selection methods - Perception - Meaning, Selectivity and Organization - Perceptual sets and Perceptual worlds - Factors influencing perception and shortcuts in judging others.

Group Dynamics - Meaning, Need for joining groups, Stages of group development and Group decision making techniques. Team types, Difference between teams and groups. Managing conflicts. Work stress - Types and Management strategies. Organizational culture - Definition and Creating a culture in organization. Organizational change.

PRACTICAL

Study of management structure and organizational pattern of selected business units. Preparation, Analysis and Presentation of case studies.

TEACHING SCHEDULE**THEORY [ABM-245]**

Lecture No.	Topic	Sub-topics/ Key Points	Weightage (%)
1	Introduction to Management	Management functions-Management Levels - Managerial Roles - Management skills - Role of Management.	10
2	Evolution of Management Thoughts	Approaches and Categories	4
3	Functions of Management	Planning: Nature and importance – Types of planning - Steps in planning – Decision making -Meaning - Types of decisions.	8
4	Organizing	Meaning, Nature and Purpose of organizing- Principles of organizing - Organization structure- Managing Human Resources- Human Resource Planning- Recruitment- Sources of recruitment	10
5	Selection - Steps in Selection Process	Orientation - Training - Management Development Programmes	4
6	Leading- Meaning	Meaning and Purpose and Leadership theories	8
7	Communication and Motivation	Meaning - Objectives - Importance - Types - Barriers, Motivational Theories	
8	Controlling	Meaning and Nature of controlling - Essential elements of controlling. Ethics and Corporate social responsibility in business	8
9	Organizational Behaviour	Definition, Importance, Historical background of Organizational Behaviour, Challenges – The organizational context - Environment - Technology	8
10	Learning	Importance of learning - Process - Approaches to learning - The learning organization.	7
11	Personality	Defining personality - Types and Traits - Personality types - The big five - The development of the self - Selection methods	7
12	Perception	Meaning, Selectivity and Organization - Perceptual sets and Perceptual worlds – Factors influencing perception and Shortcuts in judging others	7
13	Group Dynamics	Meaning, Need for joining groups, Stages of group development and group decision making techniques.	5
14	Teams	Types, Difference between Teams and Groups.	5
15	Conflicts and Work Stress Management	Types and Management strategies.	5
16	Organizational Culture	Definition and Creating a culture in organization. Organizational change	4
Total =			100

TEACHING SCHEDULE

PRACTICAL [ABM-245]

Exercise No.	Exercise Title
1 - 2	Management of business unit and its functions.
3	Visit to the business unit.
4 - 5	Organizational Structure of business unit.
6	Recruitment and Selection process of business unit.
7 - 8	SWOT analysis of business unit.
9	Power point presentation of national level business unit.
10	Power point presentation of international level business unit.
11 - 12	Financial analysis of business unit.
13	Preparation of business project proposal.
14	Case study of local level business unit.
15	Demonstration of Leadership qualities through group discussion.
16	Analysis of personality traits using standard assessment tools.

Suggested Readings [ABM-245]:

1. **Andrew J. Dubrin, 2012.** Essentials of Management, Thomson South Western, 9th Edition.
2. **Charles W., L. Hill and Steven L McShane, 2007.** Principles of Management, McGraw Hill Education, Special Indian Edition
3. **Harold Koontz and Heinz Weihrich, 2012.** Essentials of Management.
4. An International and Leadership Perspective, 9th Edition, Tata McGraw- Hill Education.
5. **Samuel C. Certo and Tervis Certo, 2012.** Modern Management: Concepts and skills, Pearson Education, 12th edition.
6. **Aaker, David, V. Kumar and George Day, 1995,** Marketing Research, 8th Edition, John Wiley & Sons.
7. **Kerlinger, Fred N., 1986,** Foundations of Behavioral Research, 3rd Edition.
8. **Kotler, P., 2001.** Marketing Management. Grada, Praha, 10th Edition.
9. **Koudelka, J., 1997.** Consumer behaviour and marketing. Grada, Praha.
10. **Michael A. Kamins, 1993.** Secondary Research: Information, Sources and Methods, Applied Social Research Methods, Volume 4, Sage Publications.

Semester :	IV	
Course No. :	ECON-244	Credit Hrs. : 2(2+0)
Course Title :	International Trade and Policy in Agriculture	

SYLLABUS

- Objectives** :
- (i) To understand the principles and mechanism of international trade in agricultural commodities,
 - (ii) To learn about agriculture trade policy, agreement and their impact on global markets,
 - (iii) To explore strategy for market access, trade negotiation and resolving trade disputes in agriculture,
 - (iv) To develop skills to analyse the national trade trend, access market opportunities and navigate regulatory framework to facilitate agriculture exports and imports.

THEORY

International Trade - Meaning, Definition, Nature and Scope. Salient features of International Trade, Differences between Internal trade and International trade, Advantages and Disadvantages of International Trade.

Theories of International Trade - Mercantilism, Theory of Absolute Cost Advantage, Theory of Comparative Cost Advantage and Modern Theory of International Trade. Terms of trade - Meaning and Types. Free trade - Meaning, Advantages and Disadvantages, Free Trade agreements.

Protectionism - Meaning, Advantages and Disadvantages of protectionism, Types of protection - Tariffs, Quotas, Subsidies, Dumping, Cartels and Commodity agreements.

Balance of Trade (BoT) and Balance of Payments (BoP) - Meaning, Differences between BoT and BoP, India's BoT and BoP position. Foreign exchange - Meaning, Foreign Exchange Rate, Types of Foreign Exchange Rate, Mechanisms of determining Foreign Exchange Rate. Foreign Exchange Market - Meaning and Functions, Instruments of international payments, Foreign Exchange Control and Foreign Exchange Reserves.

WTO - Origin, Structure, Objectives and Functions. Agreement on Agriculture - Domestic support, Market access and Export subsidies. FAO/WHO Codex Alimentarius and SPS measures. Export procedures and documentations, Types of export - Direct export and Indirect export, Export houses - Objectives and Types. Agricultural Export Promotion Organizations - APEDA, MPEDA, Commodity Boards and State Export Promoting Agencies. India's Agricultural Exports and Imports - Composition and Trading countries. India's Foreign Trade Policy - Meaning and Objectives.

TEACHING SCHEDULE**THEORY [ECON-244]**

Lecture No.	Topic	Sub-topics/ Key Points	Weightage (%)
1 - 2	International Trade	Meaning, Definition, Nature and Scope. Salient features of International Trade	5
3	Internal Trade and International Trade	Differences between Internal trade and International trade, Advantages and Disadvantages of International Trade.	5
4 - 5	Theories of International Trade	Mercantilism and Theory of Absolute Cost Advantage	6
6 - 7	Theory of Comparative Cost	Advantages and Modern Theory of International Trade.	6
8 - 9	Terms of Trade	Meaning and Types. Free trade - Meaning, Advantages and Disadvantages, Free trade agreements.	6
10 - 11	Protectionism	Meaning, Advantages and Disadvantages of Protectionism, Types of Protection - Tariffs, Quotas, Subsidies, Dumping, Cartels and Commodity agreements.	7
12 - 13	Balance of Trade (BoT) and Balance of Payments (BoP)	Meaning. Differences between BoT and BoP, India's BoT and BoP position.	5
14 - 15	Foreign Exchange	Meaning, Foreign Exchange Rate, Types of Foreign Exchange Rate, Mechanisms of determining Foreign Exchange Rate.	6
16 - 17	Foreign Exchange Market	Meaning and Functions, Instruments of International Payments, Foreign Exchange Control and Foreign Exchange Reserves.	6
18 - 19	World Trade Organization (WTO)	Origin, Structure, Objectives and Functions. Agreement on Agriculture - Domestic support, Market access and Export subsidies.	8
20	Food Safety Measures	FAO/ WHO Codex Alimentarius and SPS measures.	6
21 - 22	Export Procedures and Documentation	Steps involved in export procedures and documentation	5
23	Types of Export	Direct export and Indirect export	4
24	Export Houses	Objectives and Types	4
25	Agricultural Export	Promotion Organizations – APEDA and MPEDA	6
26 - 27	Commodity Boards and State Export Promoting Agencies	Tea board, Coffee board, Rubber board, Spices board, Tobacco board and Coconut Development Board	6
28 - 30	India's Agricultural Exports and Imports	Composition and Trading Countries.	5
31 - 32	India's Foreign Trade Policy	Meaning and Objectives.	4
Total =			100

Suggested Readings [ECON-244]:

1. **Mithani, D.M.** - Money, Banking, International Trade and Public Finance.
2. **Cherunilam, Francis** - International Trade and Export Management.
3. **Haberler, G.** - Theory of International Trade.
4. **Ajami Riad, A.** - International Business- Theory and Practices
5. **Jain, Arunkumar** - International Business
6. **Venkateshwaran, N.** - International Business Management
7. **Cherunilam and Dominick Salvatore** - International Economics
8. **Tappa, Ashwa** - International Business
9. **Justin Paul** - International Business
10. **Vaish, M.C. and Singh, Sudama** - International Economics
11. **Jhingan, M.L.** - International Economics.

Semester	: IV	
Course No.	: MKT-243	Credit Hrs. : 3(2+1)
Course Title	: Agricultural Marketing Regulations	

SYLLABUS

- Objectives** :
- (i) To understand regulatory framework governing agricultural marketing at local, national and international levels.
 - (ii) To learn about marketing laws, policies and regulations affecting the sale and distribution of agricultural products,
 - (iii) To explore role of government agencies and industry organization in enforcing marketing regulation and ensuring fair trade practices.
 - (iv) To develop skills to navigate compliance requirements, understand market access regulations and mitigate legal risk in agricultural marketing activities.

THEORY

Evolution of market legislation. Need and scope for market legislation. Review of Agricultural Produce Market Acts in India and Maharashtra. Distribution of legislative powers between parliament and state assemblies. Salient features of essential commodities Act - Food Safety and Standards Act 2006, Consumer Protection Bill 2019, Patent Act, 2002, Monopolies and Restrictive Trade Practices Act/ Competition Act, 2002, Forward Markets Act, 1952, Standards of Weights and Measures Act, 1976, The Central Warehousing Corporation Act. Provisions of Maharashtra Agricultural Marketing (Development Regulation) Act, 2007 - Establishment of Market, Constitution of Market Committee (APMC), Special Market, Conduct of Business of the Market Committee, Powers and Duties of Market Committee, Staff of the Market Committee, Regulation of the Contract Farming Trade, Maharashtra State Agricultural Marketing Board - Constitution and Functions. Role of state department of Agricultural Marketing and Directorate of Agricultural Marketing and Inspection. Agricultural Marketing Policies of the Government - Administered Price Policies -Commission for Agricultural Costs and Prices (CACP) and its Working. Policies of Procurement, Levy and Public Distribution System. Minimum Support Prices, Ceiling Price and Parity Prices. Floor Price Scheme. Food Security Policy - Procurement, Buffer Stock, Distribution, Subsidies. Food Zone. Agri Export Zones (AEZs)/ Export Oriented Units (EOUs). Introduction and Meaning of Intellectual Property, Brief Introduction to GATT, WTO, Trips and WIPO, Treaties for IPR Protection: Madrid Protocol, Berne Convention, Budapest Treaty, etc. Types of Intellectual Property and Legislations Covering IPR in India: Patents, Copyrights, Trademark, Industrial Design, Geographical Indications, Integrated Circuits, Trade Secrets. Patents Act, 1970 and Patent System in India, Patentability, Process and Product Patent, Filing of Patent, Patent Specification, Patent Claims, Patent Opposition and Revocation, Infringement, Compulsory Licensing, Patent Cooperation Treaty, Patent Search and Patent Database.

PRACTICAL

Evolution and Historical Perspectives of Agricultural Marketing Legislation, Marketing Tax and Fees, Different Agents Involved in Marketing Practices, Study on Different Agricultural Marketing Models, Review of Agricultural Marketing Policies. Study on Reform in Agricultural Marketing Sectors in India. Presentation and group discussions on above topics, Visits to different APMCs.

TEACHING SCHEDULE

THEORY [MKT-243]

Lecture No.	Topic	Sub-topics/Key Points	Weightage (%)
1	Introduction to Agricultural Marketing Regulations	Concept, Need and Importance, Evolution of Agricultural Markets in India	3
2	Evolution of Market Legislation	Pre-independence, Post-independence, Reform era (1990s - 2020s) Need and Scope for market legislation	2
3	Constitutional Framework and Legislative Powers	Union, State, Concurrent Lists Agriculture as a state subject: Implications	3
4	Agricultural Produce Market Acts in India	Purpose, Structure, Strengths and Limitations, Overview of reforms	2
5	Review of Maharashtra APMC Act (Historical)	Evolution and Key amendments, Issues addressed by reforms	2
6	Model Act : APLM Act, 2017 and Post - 2020 Reforms	Features of APLM 2017, Private markets, Direct marketing, e-trading, Impact on state APMC systems	3
7	Maharashtra Agricultural Marketing (Development and Regulation) Act, 2007 -Part I	Establishment of markets. Market area/ Yards, Licensing	3
8	Market Committees (APMCs)	Constitution Membership, Representation, Elections	4
9	Conduct of Business in Market Committees	Meetings, Powers, Responsibilities Finance, Audit, Market fee	3
10	Powers, Duties and Staff of APMCs	Enforcement, Regulation, Dispute resolution, Penalties, Licensing decisions	4
11	Special Markets and Contract Farming Regulation	Private markets, Farmer - Consumer Markets, Contract farming provisions.	4
12	Maharashtra State Agricultural Marketing Board (MSAMB)	Structure, Functions, Infrastructure development.	4
13	Dept. of Agricultural Marketing (State level)	Support services, Supervision, Reforms	3
14	Directorate of Marketing and Inspection (DMI) and AGMARK	AGMARK standards, Role in National Market Integration	3
15	National Agriculture Market (e-NAM)	Objectives, Functioning, Benefits. Interoperability with APMC markets.	5

Continued...

16	Agricultural Infrastructure Fund (AIF)	Financing for storage, Logistics, Digital infra, FPOs, Entrepreneurs and Cooperatives.	3
17	Digital and Online Agri-Market places	E-commerce platforms, Digital FPOs. Role of technology and Data governance.	2
18	Agricultural Marketing Policies in India	Policy framework, Reforms trajectory	3
19	Administered Price Policies	Objectives, Rationale price stabilization	3
20	CACP: Role, Cost Concepts & MSP System	Cost of production concepts MSP determination	5
21	Ceiling Price, Floor Price, Parity Price	Concepts and Applications	2
22	Food Security Policy	Procurement, Buffer stocks, Subsidies, Targeted PDS Food Zones and Food logistics	4
23	Essential Commodities Act (ECA) and Food Safety and Standards Act (FSSAI)	Controls on hoarding, Black-marketing FSSAI standards, Regulations and Licensing	5
24	Competition Act 2002	Anti-competitive practices, Role of Competition Commission of India (CCI)	3
25	Forward Markets Act 1952 and Warehousing Laws	Forward Trading Regulation Central Warehousing Corporation Act Standards of Weights and Measures (Brief)	4
26	Agri Export Zones (AEZs) and Export Oriented Units (EOUs)	Functions, Incentives, Examples	2
27	Global Trade Agreements	GATT, WTO, Agreement on Agriculture-Impact on Indian Agriculture Trade	3
28	Introduction to IPR in Agriculture	Meaning, Need, Importance Relevance to seeds, Biotech, Innovations	2
29	IPR Treaties and International Framework	TRIPS, WIPO, Madrid Protocol, Berne Convention, Budapest Treaty	3
30	Types of IPRs in India	Patents, Copyright, Trademarks, Industrial Designs, GI, IC Protection, Trade secrets	3
31	Patents Act 1970 and Patent System in India	Patentability criteria, Process vs Product Patents	3
32	Patent Procedure and Management	Filing, Specifications, Claims Opposition, Revocation, Infringement compulsory licensing, Patent Cooperation Treaty (PCT) Patent search and Databases.	2
Total =			100

TEACHING SCHEDULE

PRACTICAL [MKT-243]

Exercise No.	Practical Topic/ Title	Content
1	Study of Evolution and Historical Perspectives of Agricultural Marketing Legislation	Early Market Systems, Pre-/ Post-Independence Laws, Introduction to APMC structure
2	Study of Market Fees, Charges, Cess and Taxation in Agricultural Markets	Market fee structure, User charges, Licensing fees. Differences across states
3	Study of Different Marketing Agents	Commission agents, Traders, Brokers, Weighmen. Roles and Responsibilities
4	Study of Market Functionaries in Regulated Markets	Warehouse managers, Graders, Auctioneers, Hamalis. Their contribution to price discovery and Market efficiency
5	Study of Agricultural Marketing Models	Traditional vs Modern models. Cooperative, Private, Public, PPP-based models.
6	Study of National Market Models (e-NAM and Digital Platforms)	Online trading, Assaying, Digital payment systems. Integration with APMCs
7	Study of Agricultural Marketing Policies in India	MSP, APMC reforms, CACP mechanisms
8	Study of Food Security and Price Stabilization Policies	Buffer stocks, PDS, Subsidy mechanisms
9	Study of Reforms in Agricultural Marketing Sector in India	Model APLM Act, 2017 Contract Farming Regulations Post-2020 Reforms
10	Study of Agricultural Produce Market Committee (APMC) Structure	Constitution, Roles, Governance
11	Study of APMC Operations & Conduct of Business	Auctioning, Licensing, Market regulation Fee collection procedures
12	Study of State Agricultural Marketing Board	Organizational structure, Roles, Schemes
13	Study of Market Infrastructure (Storage, Grading, Assaying, Weighing Systems)	Cold storages, Warehouses, Packhouses
14	Group Presentations and Discussions on Case Studies	Students present APMC, e-NAM, Export Zones, etc.
15	Field Visit to APMC Marketing Yard	Observation of auction, Grading, Trader interactions
16	Field Visit to Agricultural Marketing Institution	(e.g., MSAMB, DMI office, Agri-logistics centre, Warehouse, e-NAM integrated mandi)

Suggested Readings [MKT-243]:

- 1. Jagdish Prasad, 1999.** Encyclopedia of Agricultural Marketing - Market Regulation and Development,(Vol.3)
 - 2. Satphal Puliani, 2020.** The Karnataka Agricultural Produce Marketing (Regulation and Development) Act 1966
 - 3. Acharya, S.S. and Agrawal, N.L., 1994.** Agricultural Prices - Analysis and Policy, Oxford and IBH, New Delhi.
 - 4. Kahlon, A.S. and George, M.V.,1965.** Agricultural Marketing and Price Policies, Allied Publishers Private Limited, New Delhi.
-

Semester	:	IV
Course No.	:	ENGG-242
	Credits Hrs.	: 2(1+1)
Course Title	:	Farm Machinery and Power and Custom Hiring Services

SYLLABUS

- Objectives :**
- (i) To understand the principles and operation of farm machinery and power equipment.
 - (ii) To learn about the selection, maintenance and efficient use of agricultural machinery for various farm operations.
 - (iii) To explore the concept and benefits of custom hiring services in agriculture.
 - (iv) To develop skills to optimize farm machinery usage, reduce operational costs and improve overall farm productivity through efficient machinery management and custom hiring services.

THEORY

Status of Farm Power in India, Sources of Farm Power, I.C. engines, Working principles of I.C. engines, Comparison of two stroke and four stroke cycle engines. Study of different components of I.C. engine, I.C. engine Terminology and Solved problems, Familiarization with different systems of I.C. engines: Air cleaning, Cooling, Lubrication, Fuel supply and Hydraulic control system of a tractor, Familiarization with Power Transmission System : Clutch, Gear box, Differential and Final drive of a tractor, Tractor types, Cost analysis of tractor power and attached implement, Familiarization with Primary and Secondary Tillage implement, Implement for hill agriculture, Implement for intercultural operations, Familiarization with sowing and planting equipment, Calibration of a seed drill and solved examples, Familiarization with plant protection equipment, Familiarization with Harvesting and Threshing equipment.

PRACTICAL

Study of different components of I.C. engine. To study air cleaning and cooling system of engine, Familiarization with clutch, transmission, Differential and Final drive of a tractor, Familiarization with lubrication and Fuel supply system of engine, Familiarization with brake, Steering, Hydraulic control system of engine, Learning of tractor driving, Familiarization with operation of power tiller, Implements for hill agriculture, Familiarization with different types of Primary and Secondary tillage implements: Mould plough, Disc plough and Disc harrow. Familiarization with seed - cum - fertilizer drills their seed metering mechanism and calibration, Planters and Transplanter. Familiarization with different types of sprayers and Dusters, Familiarization with different inter - Cultivation equipment, Familiarization with Harvesting and Threshing machinery.

TEACHING SCHEDULE

THEORY [ENGG-242]

Lecture No.	Topic	Sub-topics/ Key Points	Weightage (%)
1	Status of Farm, Power in India, Source of Farm, Power in India	Human Power, Animal Power, Mechanical Power, Electrical Power Renewable Energy (Biomass, Sun and Wind)	10
2	I.C. Engines	Types of I.C. engines, Petrol and Diesel Engine, Two Stroke and Four Stroke Engines, Working Principles, Comparison between Petrol and Diesel engine, Two-stroke and Four-stroke cycle engines, Components of Engine	10
3 - 4	I.C. Engine - Terminology	Stroke Bore Ratio, Piston Displacement, Compression ratio, Displacement Volume, Horse Power, Break Horse Power, Thermal Efficiency, Mechanical efficiency, Solved problems	10
5 - 6	Different Systems of I.C. Engines	Air cleaning, Cooling Systems, Fuel Supply Systems, Lubrication Systems, Hydraulic control system of a Tractor	10
7 - 8	Power Transmission System	Clutch, Gear Box, Differential unit and Final drive of a tractor, Power take-off, Tractor types, Cost analysis of tractor power and attached implement	10
9	Tillage Implements	Tillage - Objectives/ Functions Primary and Secondary tillage implements: Primary tillage implements: Indigenous plough, Mould Board Plough, Disk Plough Secondary Tillage implements: Harrow - Disk Harrow, Drag Harrow, Blade Harrow	10
10 - 11	Sowing and Planting Equipments	Sowing: Seed drill, Seed-cum-Fertilizer drill, Seed Metering Mechanisms, Calibration of Seed Drill Paddy Transplanter: Manual Rice Planter, Self Propelled Paddy Transplanter, Establishing modified mat nursery	10
12	Implement for Hill Agriculture & Intercultural Operations	Types of cultivators, Equipment for weed control	5
13	Harvesting and Threshing Equipments	Harvesting equipments: Mowers, Reapers Threshing-Methods and Power Thresher, Combine Harvester	10

Continued...

14-15	Plant Protection Equipments	Sprayers- Components: Bucket type sprayer, Knapsack type sprayer, Compression type sprayer, Hand atomizer, Engine powered Sprayers, Dusters: Plungers type hand dusters, Rotary type, Knapsack type, Power-operated dusters, Air Plane dusters	10
16	Custom Hiring	Definition, Objectives, Principles and Benefits, Potential for Custom Hiring Centers	5
Total =			100

TEACHING SCHEDULE

PRACTICAL [ENGG-242]

Exercise No.	Exercise Title
1	Study of different components of Internal Combustion Engine
2	Study of air cleaning and cooling system of engine
3 - 4	Study of clutch, transmission, differential and final drive of a tractor
5	Study of lubrication and fuel supply system of engine
6	Study of brake, steering, hydraulic control system of engine
7	Learning tractor driving
8	Study of operation of power tiller
9	Study of Implements for hill agriculture
10 - 11	Study of different types of primary and secondary tillage implements: mould plough, disc plough and disc harrow
12 - 13	Study of seed-cum-fertilizer drills, their seed metering mechanism and calibration, planters and transplanter
14	Study of different types of sprayers and dusters
15	Study of different inter-cultivation equipment
16	Study of harvesting and threshing machinery.

Suggested Readings [ENGG-242]:

1. **Nakra, C.P.** Farm Machinery and Equipment's, , Dhanpat Rai and Sons, New Delhi
2. **Jagdishwar Sahay**, Elements of Agricultural Engineering, Standard Publishers Distributors, New Delhi
3. **Michael, A.M. and T.P. Ojha**, Principles of Agricultural Engineering (Vol-I), Tata McGraw Hill Publishing Co. Ltd, New Delhi
4. **Singhal, O.P.**, Elements of Agricultural Engineering, Merath Aman Public House, Meerut.

Semester	:	IV
Course No.	:	HORT-242
		Credit Hrs. : 2(1+1)
Course Title	:	Post-harvest Management and Value Addition of Fruits and Vegetables

SYLLABUS

- Objectives :**
- (i) To understand the principles and techniques of post-harvest management for fruits and vegetables.
 - (ii) To learn about value addition processes such as sorting, grading, packaging and processing.
 - (iii) To explore methods to minimize post-harvest losses and extend the shelf life of fruits and vegetables.
 - (iv) To develop skills to add value to agricultural produce, increase marketability, and enhance profitability for farmers and stakeholders.

THEORY

Importance of post-harvest processing of fruits and vegetables; Extent and possible causes of post-harvest losses; Pre-harvest factors affecting post-harvest quality, Maturity, Ripening and Changes occurring during ripening; Respiration and Factors affecting respiration rate; Harvesting and Field handling; Storage (ZECC, Cold storage, CA, MA and Hypobaric); Value addition concept: Principles and Methods of preservation; Minimal processing: Intermediate moisture foods- Jam, Jelly, Marmalade Concepts and Standards; Fermented and Non-fermented beverages; Drying/Dehydration of fruits and vegetables - Concept and Methods; Canning Concepts and Standards, Packaging of products.

PRACTICAL

Containers for shelf-life extension; Effect of temperature on shelf life and quality of produce; Chilling and freezing injury in vegetables and fruits; Extraction and preservation of pulps and juices; Preparation of Jam, Jelly, RTS, Nectar, Squash, Wine Fruit bar. Candy, Tomato products; Quality evaluation of products- physio- chemical and sensory; Visit to processing unit/ industry.

TEACHING SCHEDULE

THEORY [HORT-242]

Lecture No.	Topic	Sub-topics/ Key Points	Weightage (%)
1	Pre-harvest Management	Importance of post-harvest processing of fruits and vegetables	8
2		Extent and Possible causes of post-harvest losses	6
3		Pre-harvest factors affecting post-harvest quality	6
4	Maturity and Ripening	Maturity - Definition, Types, Judging Maturity Ripening - Definition, Changes occurring during ripening	8
5	Respiration	Definition, Factors affecting respiration rate.	8
6	Harvesting	Definition, Methods of harvesting field handling	8
7	Storage	Storage - ZECC, Cold storage, CA, MA and Hypobaric	8
8	Value addition	Value addition concept, Principles of preservation, Methods of preservation	10
9		Minimal Processing, Intermediate moisture foods	6
10-11	Concept and Standards	Jam, Jelly and Marmalade	8
12-13		Fermented and Non-fermented beverages	6
14		Drying/ Dehydration of Fruit and Vegetables	6
15		Canning	6
16	Packaging	Definition, Types and Principles	6
Total =			100

TEACHING SCHEDULE

PRACTICAL [HORT-242]

Exercise No.	Exercise Title
1	Containers for shelf-life extension
2	Effect of temperature on shelf life and quality of produce
3	Chilling and Freezing injury in vegetables and fruits
4	Extraction and Preservation of pulps and juices
5	Preparation of Jam
6	Preparation of Jelly
7	Preparation of RTS
8	Preparation of Nectar
9	Preparation of Squash
10	Preparation of Wine
11	Preparation of Fruit bar
12	Preparation of Candy
13	Preparation of Tomato products
14	Quality evaluation of products-physico-chemical and sensory
15 - 16	Visits to Processing units/ Industry

Suggested Readings [HORT-242]:

1. **Bhutani, R.C., 2003.** Fruit and Vegetable Preservation, Biotech Books.
2. **Mitra, S.K., 1997.** Post Harvest Physiology and Storage of Tropical and Sub-tropical Fruits, CABI.
3. **Ranganna S., 1997.** Hand Book of Analysis and Quality Control for Fruit and Vegetable Products, Tata McGraw-Hill.
4. **Sudheer, K.P., and Indira, V., 2007.** Post Harvest Technology of Horticultural Crops, New India Publ. Agency.
5. **Willis, R., McGlassen, W.B., Graham, D. and Joyce, D., 1998.** Post Harvest: An Introduction to the Physiology and Handling of Fruits, Vegetables and Ornamentals, CABI.

B.Sc. (Hons.) Agri. Business Management

List/ Bouquet of Skill Enhancement Courses (SECs)

[in continuation of the SECs' Syllabi prescribed under I, II & III semesters]

Sr. No.	Course No.	Course Title	Sem.	Credit Hrs.
1.	SEC-111	Computer Applications in Agriculture	I	2(0+2)
2.	SEC-112	Production Technology for Bioagents and Biofertilizers	I	2(0+2)
3.	SEC-123	Seed Production and Seed Testing	II	2(0+2)
4.	SEC-124	Livestock Production and Management	II	2(0+2)
5.	SEC-235	Poultry Production Technology	III	2(0+2)
6.	SEC-246	Development of Agri-business Proposal	IV	2(0+2)
7.	SEC-xxx	Mushroom Production Technology		2(0+2)
8.	SEC-xxx	Beneficial Insect Farming		2(0+2)
9.	SEC-xxx	Post-harvest Processing Technology		2(0+2)
10.	SEC-xxx	Horticulture Nursery Management		2(0+2)
11.	SEC-xxx	Plantation Crops Production and Management		2(0+2)
12.	SEC-xxx	Practices in Plant Tissue Culture		2(0+2)
13.	SEC-xxx	Production of Milk and Milk Products		2(0+2)
14.	SEC-xxx	Introduction to Drying Technology and Dryers		2(0+2)
15.	SEC-xxx	Introduction to Milling		2(0+2)
16.	SEC-xxx	Introduction to Manufacturing of Bakery Products		2(0+2)
17.	SEC-xxx	Introduction to Bottling and Canning Line		2(0+2)
18.	SEC-xxx	Print and Electronic Journalism		2(0+2)
19.	SEC-xxx	Audio Visual Aids for Communication		2(0+2)
20.	SEC-xxx	Apiculture		2(0+2)
21.	SEC-xxx	Landscape Gardening		2(0+2)
22.	SEC-xxx	Packing and Packaging of Horticultural Crops		2(0+2)
23.	SEC-xxx	Seed Production techniques in Vegetable crops		2(0+2)
24.	SEC-xxx	Sericulture		2(0+2)
25.	SEC-xxx	Post-Harvest Management of Horticultural Produce		2(0+2)
26.	SEC-xxx	Vermicomposting production		2(0+2)
27.	SEC-xxx	Soil and Water Testing		2(0+2)
28.	SEC-xxx	Management of Fish Rearing		2(0+2)
29.	SEC-xxx	Hydroponics		2(0+2)
30.	SEC-xxx	Aquaponics		2(0+2)

Note: (i) Skill Enhancement Courses can be added/offered as per the facilities and resources available at the respective universities/colleges based on the relevance to the region and the UG degree subject. **However, for the B.Sc. (Hons.) ABM, the above-mentioned SECs at Sr. No. 1 to 6 are already distributed across the given Semesters as per the ICAR-Sixth Deans' Committee Report.**

- (ii) The host University/ College may also choose suitable SEC courses from those listed under other UG degree programs.
- (iii) Above list/ bouquet/ basket of SEC courses is an indicative list and subject to modification as applicable therein.
- (iv) In case of unavailability of the detailed course-wise syllabus/ teaching schedules of any of above SEC courses, the same can be primarily developed and followed at College/ University level in current the academic year. However, the same can be obtained from the respective UG Degree Coordinator/ Discipline Coordinators and can be followed w.e.f. AY, 2025-26.