B.Sc (Hons.) Agriculture Fourth Year/ Eight Semester

Seed Production Technology

Course Code: AG 411

Course Objective

1. To introduce the basic knowledge of planting value, seed testing, principles of seed technology
2. To study about seed production, seed certification, seed legislation, seed act and seed processing
3. To familiarize the students with the agencies involved in the seed production and management in India
4. To aware the students about the concept of maintenance breeding , seed priming and seed cost-benefit ratio.
5. To study about the hybrid seed production in different crops

Course Outcome:*After completion of the course, a student will be able to*

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students are able to know the basic principles involved in seed planting value, germination percentage and seed testing
CO2	Learned the methods of seed production, seed certification, seed legislation, seed act and seed processing
CO3	Know the agencies and their functions in the seed production and management at National and state level.
CO4	Learned the basics of maintenance breeding, seed priming and seed cost-benefit ratio.
CO5	Students know and can practice the production of hybrid seeds in the important crops of India.

	CO	**PO1** Basic Agriculture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations	**PO4** Modern implementation usage	**PO5** Modern Horticultural implements	**PO6** Modernplant protection implements	**PO7** Extension Programme	**PO8** Environment and sustainability	**PO9** Ethics	**PO10** Individual and team work	**PO11** Communication	**PO12** Lifelong learning
CO1	Students able to know the basic principles involved in seed planting value, germination percentage and seed testing	3		3	1	1	3		3		3		3
CO2	Learned the methods of seed production, seed certification, seed legislation, seed act and seed processing.	3		3	1	1	2		3		3		3
CO3	Know the agencies and their functions in the seed production and management at National and state level.	3		1	1	1	1		3	2	1		3
CO4	Learned the basics of maintenance breeding, seed priming and seed cost-benefit ratio.	3		3	2	1	1		3		2		3
CO5	Students know and can practice the production of hybrid seeds in the important crops of India..	3		3	1	1	2		3		3		3
3: Strong contribution, 2: average contribution, 1: Low contribution													

Integrated Farming System

COURSE CODE: AG413

COURSE OBJECTIVES:

- Basic concept of Farming systemSustainable agriculture- Introduction, definition, goal and current concepts
- Knowledge of Sustainable agriculture-problems and its impact on agriculture
- Principles of conservation agriculture strategies
- Basic concepts of Cropping system and pattern, multiple cropping system, Efficient cropping system and their evaluation
- Study of Allied enterprises and their importance, Tools for determining production and efficiencies in cropping and farming system

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Knowledge of Farming systemSustainable agriculture- Introduction, definition, goal and current concepts
CO2	Knowledge of Sustainable agriculture-problems and its impact on agriculture
CO3	Cropping system and pattern, multiple cropping system, Efficient cropping system and their evaluation
CO4	Knowledge of Rain fed Farming System, Scope of Farming System, Cropping system and pattern, multiple cropping system,
CO5	Efficient cropping system and their evaluation, Allied Enterprises, Cattle Maintenance, Sheep and Goat Rearing, Poultry, Duck Rearing, Piggery, Bee Keeping, Aquaculture, Sericulture, Mushroom cultivation, Biogas Plant, Vermicompost Unit, Integration of Enterprises

	CO	PO 1. Basic Agriculture knowledge	PO 2. Problem Solving	PO 3. Field Experimentations	PO 4.Modern implementation usage	PO 5.Modern Horticultural implements	PO 6. Modern Plant Protection implements	PO 7. Extension Program	PO 8. Environment and sustainability	PO 9. Ethics	PO 10. Individual and team work	PO 11. Communication	PO 12. Life-long learning
CO1	Knowledge of Farming systemSustainable agriculture-Introduction, definition, goal and current concepts	2	2	3	2	1	2	1				1	2
CO2	Knowledge of Sustainable agriculture-problems and its impact on agriculture	3	2	3	2	1	2	2	2	2	2	1	2
CO3	Cropping system and pattern, multiple cropping system, Efficient cropping system and their evaluation	2	2	2				2	2	2	3	1	2
CO4	Knowledge of Rain fed Farming System, Scope of Farming System, Cropping system and pattern, multiple cropping system,	2	2	2				2	2	2	3	1	2
CO5	Efficient cropping system and their evaluation, Allied Enterprises, Cattle Maintenance, Sheep and Goat Rearing, Poultry, Duck Rearing, Piggery, Bee Keeping, Aquaculture, Sericulture, Mushroom cultivation, Biogas Plant, Vermicompost Unit, Integration of Enterprises	2	2	2	3	1	2	1	2	2			
3: Strong contribution, 2: average contribution, 1: Low contribution													

Water Management (Watershed Micro-irrigation Problematic Water)

COURSE CODE: AG414

COURSE OBJECTIVES:

- Basic concept of Water Management- Introduction, definition, goal and current concepts
- Knowledge of Watershed Micro-irrigation practices, Water Resources and Development in India and UP, Rainfall pattern of the country and pattern of onset and withdrawal of monsoon
- Basic concept of Rainfall pattern of the country, Crop water Requirement, Water Management of different Crops, Method of Irrigation
- Basic concepts of Cropping system and pattern, multiple cropping system, Efficient cropping system and their evaluation
- Concept, objective, principles and components of watershed management, factors affecting watershed management.

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Knowledge of Water Management- Introduction, definition, goal and current concepts
CO2	Basic concept of Rainfall pattern of the country, Crop water Requirement, Water Management of different Crops, Method of Irrigation
CO3	Knowledge of Water Resources and Development in India, Watershed Micro-irrigation practices,
CO4	Concept, objective, principles and components of watershed management, factors affecting watershed management
CO5	Knowledge of Soil Moisture, Determination of field capacity and wilting point, Calculation of irrigation water requirements,

	CO	PO 1. Basic Agriculture knowledge	PO 2. Problem Solving	PO 3. Field Experimentations	PO 4.Modern implementation usage	PO 5.Modern Horticultural implements	PO 6. Modern Plant Protection implements	PO 7. Extension Program	PO 8. Environment and sustainability	PO 9. Ethics	PO 10. Individual and team work	PO 11. Communication	PO 12. Life-long learning
CO1	Knowledge of Water Management-Introduction, definition, goal and current concepts	2	2	3	2	1	2	1	2	2	2	1	2
CO2	Basic concept of Rainfall pattern of the country, Crop water Requirement, Water Management of different Crops, Method of Irrigation	3	2	3	2	1	2	2	2	2	2	1	2
CO3	Knowledge of Water Resources and Development in India, Watershed Micro-irrigation practices,	2	2	2	3	1	2	2	2	2	3	1	2
CO4	Concept, objective, principles and components of watershed management, factors affecting watershed management	2	2	2	2	1	2	2	2	2	3	1	2
CO5	Knowledge of Soil Moisture, Determination of field capacity and wilting point, Calculation of irrigation water requirements,	2	2	2	3	1	2	1	2	2	3	1	2
3: Strong contribution, 2: average contribution, 1: Low contribution													

Soil Management (Conservation, Problematic soil, Soil quality)

Course Code: AG415

Course Objective

1. To introduce the concept of problematic soil and its management.
2. To learn about soil health and soil quality.
3. To study about the reclamation of problematic soil.
4. To familiarize the students about soil and water conservation methods.
5. To aware the students about the liming practices.

Course Outcome:

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students learned about the different types of problematic soil and its management.
CO2	Learned about thesoil health and soil quality.
CO3	Students learned about the reclamation of problematic soil. .
CO4	Students knew about the concept of liming practices
CO5	Familiarized about the soil and water conservation practices

	CO	**PO1** Basic Agriculture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations	**PO4** Modern implementation usage	**PO5** Modern Horticultural implements	**PO6** Modernplant protection implements	**PO7** ExtensionProgramme	**PO8** Environment and sustainability	**PO9** Ethics	**PO10** Individual and team work	**PO11** Communication	**PO12** Lifelong learning
CO1	Students learned about the different types of problematic soil and its management.	3	1	2	2	1	1		3		2		3
CO2	Learned about thesoil health and soil quality.	3	1	1	2	1	1		3		3		3
CO3	Students learned about the reclamation of problematic soil. .	3	1	2	2	1	1		3		2		3
CO4	Students knew about the concept of liming practices	3	1	2	1	1	1		3		3		3
CO5	Familiarized about the soil and water conservation practices	3	1	2	2	1	1		3		2		3
3: Strong contribution, 2: average contribution, 1: Low contribution													

Crop Weather Interaction

Course Code: AG416

Objectives:

- To gain basic knowledge of crop weather interaction
- To study Importance or Significance of weather Forecast in agriculture
- To Assess and develop importance of weather monitoring in Farm production
- To study radiation laws

Outcome:

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students gain knowledge regarding crop weather interaction
CO2	They understand the basics of radiation law
CO3	They gain knowledge to increase the production and productivity of crops
CO4	They gain knowledge methods of wind breaks
CO5	They also know about the importance of weather monitoring in farm production

CO-PO MAPPING:

	CO	**PO1** Basic Agriculture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations	usage	**PO5** Modern Agriculture/Horticultural implements	**PO6** Modernplant protection implements	**PO7** ExtensionProgramme	**PO8** Environment and sustainability	**PO9** Ethics	**PO10** Individual and team work	**PO11** Communication	**PO12** Lifelong learning
CO1	Students gain knowledge regarding livestock in Agriculture.	3	1	2	1	1	3	3	3		3	1	3
CO2	They understand the basics of knowledge of breeds of animals.	3	3	3	1		3	3	3		3	3	2
CO3	They gain knowledge regarding various livestock programs in India.	3	2	1	1		2	3	3	1	1	2	3
CO4	They have knowledge about the different livestock programs of Govt of India.	3	2	2	2		3	3	3		2	3	3
CO 5	Able to know about the Role of women Place of livestock in the national economy.	3	1	1	1	1	2	3	3		2	3	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

IPM and IDM (Pest Disease Scouting)

Course Code: AG 418

Course Objective

1. To introduce the basic knowledge of IPM and IDM.
2. To focus on Various tools of IPM - Cultural, Mechanical, Physical, Biological, Legal and Chemical.
3. To make students familiar with Components of IDM.
4. To figure out different crops like wheat, chickpea, vegetables

Course Outcome:

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students have basic knowledge of IPM and IDM.
CO2	Students can understand the Various tools of IPM - Cultural, Mechanical, Physical, Biological, Legal and Chemical
CO3	Students are students familiar with Components of IDM.
CO4	Students are able to figure out different methods for IPM
CO5	Students have knowledge of differentcrops like wheat, chickpea, vegetables

CO-PO MAPPING:

	CO	**PO1** Basic Agriculture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations	**PO4** Modern implementation usage	**PO5** Modern Horticultural implements	**PO6** Modernplant protection implements	**PO7** ExtensionProgramme	**PO8** Environment and sustainability	**PO9** Ethics	**PO10** Individual and team work	**PO11** Communication	**PO12** Lifelong learning
CO1	Students have basic knowledge of IPM and IDM.	3	3	3				3	3	2	3	2	3
CO2	Students can understand the Various tools of IPM - Cultural, Mechanical, Physical, Biological, Legal and Chemical	3	3	3				1	3	1	3	3	2
CO3	Students are students familiar with Components of IDM.	3	3	2				1	3	3	1	3	3
CO4	Students are able to figure out different methods for IPM	3	3	3				2	3	2	2	3	3
CO5	Students have knowledge of differentcrops like wheat, chickpea, vegetables	2	2	1				1	3	2	2	2	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

APICULTURE

COURSE CODE: AG420

COURSE OBJECTIVES:

- Basics knowledge of apiculture
- Knowledge of external morphology of honeybees including various species of economic importance
- Knowledge of bee keeping apparatus and implements
- Type of honeybees used at commercial level
- Classification upto family
- Basics of crops used by honeybees for collection of pollen

COURSE OUTCOMES (CO): ***After completion of the course, a student will be able to***

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Know about the concept of apiculture
CO2	External morphology of honeybees including various species of economic importance
CO3	Bee keeping implements and apparatus
CO4	Commercial and economic honey production
CO5	Crops used as nectar for honeybee

CO-PO MAPPING:

	CO	PO 1. Basic Agriculture knowledge	PO 2. Problem Solving	PO 3. Field Experimentations	PO 4.Modern implementation usage	PO 5.Modern Horticultural implements	PO 6. Modern Plant Protection implements	PO 7. Extension Program	PO 8. Environment and sustainability	PO 9. Ethics	PO 10. Individual and team work	PO 11. Communication	PO 12. Life-long learning
CO1	Know about the concept of apiculture	3	2	3	2	2	3	2	3	2	3	2	3
CO2	External morphology of honeybees including various species of economic importance	2	2	2	2	3	3	2	3	2	2	1	3
CO3	Bee keeping implements and apparatus	3	3	3	3	3	3	1	3	2	2	3	3
CO4	Commercial and economic honey production	3	3	3	1	3	3	1	3	2	1	1	3
CO5	Crops used as nectar for honeybee	3	3	2	1	3	3	1	3	2	1	2	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

Mushroom (Cultivation)

Course Code: AG421

Course objective:

1. Knowledge about importance and scope of mushrooms for human nutrition.
2. To know about origin, geographical distribution, soil and climatic requirement of mushrooms of different regions.
3. To know how to differentiate poisonous and edible mushrooms.
4. Cultivation of different type of mushrooms.
5. Knowledge for care and protection of mushroom beds

Course Outcome about the basic criteria of about

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to understand importance and scope of mushrooms
CO2	To learn morphology of different types of mushrooms and differentiation of poisonous and edible mushrooms
CO3	Able to isolate and maintain pure culture of different mushroom cultures.
CO4	To learn cultivation of different seasonal mushrooms
CO5	To develop small unit model for mushroom cultivation

CO-PO MAPPING:

	CO	**PO1** Basic Agriculture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations	**PO4** Modern implementation usage	**PO5** Modern Agricultural /Horticultural implements	**PO6** Modernplant protection implements	**PO7** Extension Programme	**PO8** Environment and sustainability	**PO9** Ethics	**PO10** Individual and team work	**PO11** Communication	**PO12** Lifelong learning
CO1	Able to understand importance and scope of mushrooms	2	3	2	2	1	2	3	3	1	1	2	3
CO2	To learn morphology of different types of mushrooms and differentiation of poisonous and edible mushrooms	2	3	3	2	1	2	3	3	2	2	2	3
CO3	Able to isolate and maintain pure culture of different mushroom cultures	2	3	3	2	1	3	3	3	2	3	2	3
CO4	To learn cultivation of different seasonal mushrooms	2	3	3	3	1	2	3	3	2	3	2	3
CO 5	To develop small unit model for mushroom cultivation	2	3	3	3	1	2	3	3	2	3	2	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

Bio-control agents and bio-pesticide (mass multiplication and uses)

Course Code: AG422

Course objective

1. To give knowledge of basic concept of biological control
2. To give knowledge about the Advantages and limitations of biological control in IPM
3. To give knowledge about Types of natural enemies- Parasitoids and predators
4. To give knowledge about Role of biological control in IPM.

Course Outcome

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to know what are the concept of biological control
CO2	Can use the basic knowledge regarding Advantages and limitations of biological control in IPM
CO3	Students are able to know about different types of natural enemies- Parasitoids and predators
CO4	Study of Role of biological control in Integrated Pest management
CO5	By the end of course students will be able to control of different insect pests by bio-control methods

CO-PO MAPPING

	CO	**PO1** Basic Agricultural knowledge	**PO2** Problem Solving	**PO3** Lab/Field Experimentations	**PO4** Modern implements usage	**PO5** Modern Horticultural/ Agricultural implements	**PO6** Modern plant protection implements	**PO7** Extension Programme	**PO8** Ethics	**PO9** Individual and team work	**PO10** Communication	**PO11**Lifelong learning
CO1	Able to know what are the concept of biological control	3	3	2	2	3		3		1	2	3
CO2	Can use the basic knowledge regarding Advantages and limitations of biological control in IPM	3	3	3	2	3	3	3				2
CO3	Students are able to know about different types of natural enemies- Parasitoids and predators	3	3	2		3	1	3				3
CO4	Study of Role of biological control in Integrated Pest management	3	3	3	3		2	3				3
CO5	By the end of course students will be able to control of different insect pests by bio-control methods	3	3	3	3	1	3	3	1			3
1: Low contribution, 2: average contribution, 3: Strong contribution												

Commercial Vegetable Production

Course Code: AG424

Course objective

1. To give knowledge of basic concept of vegetable production
2. To give knowledge about the different techniques physiological disorder of vegetables
3. To give knowledge about Nutrition-Role of macro and Micro-nutrients
4. To give knowledge about growth regulators in vegetable production .

Course Outcome

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to know what are the basic criteria for vegetable production
CO2	Can use the basic knowledge regarding different techniques physiological disorder of vegetables
CO3	Students are able to know about Nutrition Role in the form of macro and Micro-nutrients
CO4	Study of growth regulators in vegetable production
CO5	By the end of course students will be able to know the knowledge regarding different types of vegetable production.

CO-PO MAPPING

	CO	**PO1** Basic Agricultural knowledge	**PO2** Problem Solving	**PO3** Lab/Field Experimentations	**PO4** Modern implements usage	**PO5** Modern Horticultural/ Agricultural implements	**PO6** Modernplant protection implements	**PO7** Extension Programme	**PO8** Ethics	**PO9** Individual and team work	**PO10** Communication	**PO11**Lifelong learning
CO1	Able to know what are the basic criteria for vegetable production	3	3	2	2	3		3		1	1	3
CO2	Can use the basic knowledge regarding different techniques physiological disorder of vegetables	3	3	3	2	3	3	3				2
CO3	Students are able to know about Nutrition Role in the form of macro and Micro-nutrients	3	3	2		3	1	3				3
CO4	Study of growth regulators in vegetable production	3	3	3	3		2	3				3
CO5	By the end of course students will be able to know the knowledge regarding different types of vegetable production.	3	3	3	3	1	3	3	1			3
1: Low contribution, 2: Average contribution, 3: Strong contribution												

Commercial fruit production

COURSE CODE: AG426

COURSE OBJECTIVES:

1. To understand importance of rootstock and plant propagation
2. To get knowledge about training and pruning
3. To get awareness about different nutrient management practices for fruit crops
4. To get knowledge about cultivation of fruit crops
5. To get knowledge regarding crop protection measure for fruit crops

COURSE OUTCOMES (CO):
After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Know about different climatic conditions for fruit crop
CO2	Demonstrate a fundamental understanding of essential plant nutrients for growth of fruit plants
CO3	The advancement of knowledge and better understanding of canopy management for fruit crops
CO4	Apply their knowledge for use of growing fruit crops
CO5	Apply horticultural skills and knowledge to control insect pest of fruit crops

CO-PO MAPPING:

	CO	**PO1** Basic Agriculture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations	**PO4** Modern implements usages	**PO5** Modern Agricultural/Horticultural implements	**PO6** Modernplant protection implements	**PO7** ExtensionProgramme	**PO8** Environment and sustainability	**PO9** Ethics	**PO10** Individual and team work	**PO11** Communication	**PO12** Lifelong learning
CO1	Know about different climatic conditions for fruit crop	3	3	3	1	3	3	1	3	1	1	1	3
CO2	Demonstrate a fundamental understanding of essential plant nutrients for growth of fruit plants	3	3	3	2	3	1		3	2	3	1	2
CO3	The advancement of knowledge and better understanding of canopy management for fruit crops	3	2	1	1	3	2	2	3	3	2	1	2
CO4	Apply their knowledge for use of growing fruit crops	3	2	3	2	3	3		3	2	3	1	2
CO5	Apply horticultural skills and knowledge to control insect pest of fruit crops	3	2	3	1	3	2		3	3	3	2	2
3: Strong contribution, 2: average contribution, 1: Low contribution													

Nursery Management of Horticultural Crops

Course Code: AG 427

Course objective:

1- To develop an understanding among students on physiological and anatomical aspects of plant propagation for nursery business management.
2- To acquire knowledge regarding theory and practice of cultural production techniques and methods for raising seedlings under plant propagating structure.
3- To impart knowledge to the students on fundamental principles and practices to be followed in nursery management.
4- To know about the factors to be considered in the establishment of commercial nurseries in fruit, vegetable and ornamental plants.
5- To know about special treatments for improving germination and rooting of cutting.

Course Outcome

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Study about the different methods of cutting, budding, layering and grafting
CO2	Understands selection of quality seeds tested by Seed Corporation for effective germination and growth of horticultural crops
CO3	Knowledge on care, handling and raising healthy seedlings
CO4	Students are able to know about role of green house,storehousesandnursery structures in propagation of plants
CO5	Able to understand the importance of rootstock production and use of rootstock impart high yield and improve the quality of crops.

CO-PO MAPPING:

	CO	**PO1** Basic Agriculture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations	**PO4** Modern implementation usage	**PO5** Modern Agricultural /Horticultural implements	**PO6** Modern plant protection implementsimplementsimplements	**PO7** Extension Program	**PO8** Environment and sustainability	**PO9** Ethics	**PO10** Individual and team work	**PO11** Communication	**PO12** Lifelong learning
CO1	Study about the different methods of cutting, budding, layering and grafting	3	3	2	2	3	3	1					3
CO2	Understands selection of quality seeds tested by Seed Corporation for effective germination and growth of horticultural crops	3	3				3	1					3
CO3	Knowledge on care, handling and raising healthy seedlings	3	3	3	2	3	3	1	3				3
CO4	Students are able to know about role of green house,storehousesandnursery structures in propagation of plants	3	3	2	2		3		3				3
CO5	Able to understand the importance of rootstock production and use of rootstock impart high yield and improve the quality of crops.	3	3		2		2		1				3
3: Strong contribution, 2: average contribution, 1: Low contribution													

PROTECTED CULTIVATION OF HORTICULTURAL CROPS AND SEED PRODUCTION OF VEGETABLES AND FLOWERS

COURSE CODE: AG 428

COURSE OBJECTIVES:

1. Development of better understanding regarding recent advances in crop management under protected cultivation.

2. Obtaining sufficiency in fruits, vegetables and flowers under protected cultivation in on and off season.

3. Better designing of infrastructure for protected cultivation in different agro-climatic conditions.

4. Enhancement of total crop duration of horticultural crops than traditional ones.

5. Developing low cost indigenous protected cultivation technologies for enhancing productivity in horticultural crops.

COURSE OUTCOMES (CO):
After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Economic importance of vegetable and flowers
CO2	Development of hybrid and improved varieties suitable for protected cultivation of horticultural crops.
CO3	The advancement of knowledge and better understanding of plant and environment, agricultural practices are modified or new practices developed for high productivity.
CO4	Aims at obtaining maximum production at minimum cost.
CO5	Apply horticultural skills and knowledge to operate various business entities found in the horticultural industry

CO-PO MAPPING:

	CO	**PO1** Basic Agriculture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations	**PO4** Modern implements usages	Agricultural/Horticultural	**PO6** Modernplant protection implements	**PO7** ExtensionProgramme	**PO8** Environment and sustainability	**PO9** Ethics	**PO10** Individual and team work	**PO11** Communication	**PO12** Lifelong learning
CO1	Economic importance of vegetable and flowers	3	3	2	1	3	3		3	1	1	1	3
CO2	Development of hybrid and improved varieties suitable for protected cultivation of horticultural crops.	3	2	3	2	3	3		3	2	3	3	2
CO3	The advancement of knowledge and better understanding of plant and environment, agricultural practices are modified or new practices developed for high productivity.	3	2	3	2	3	2		3	3	2	2	3
CO4	Aims at obtaining maximum production at minimum cost.	3	2	3	2	3	3		3	2	3	3	3
CO5	Apply horticultural skills and knowledge to operate various business entities found in the horticultural industry	3	1	1	1	3	2		3	3	3	2	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

Processing and Value Addition of Horticultural Crops

Course Code: AG 429

Course objective:

1. To provide information to the students on the basic principles and methods of preservation.
2. To impart knowledge to the student about the role and importance of post-harvest management of horticultural crops.
3. To make familiarizationofharvestingindicesoffruitsandvegetables and harvesting devices.
4. To study the different packaging methods and materials for variousfruitsandvegetables.
5. To study different process and methods for reduction of losses in handling, packaging and storage of horticultural crops along with preparation of processed items from them.

Course Outcome:

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Understand the various methods of post- harvest management and its role in providing better quality produce to the consumer.
CO2	Learn various storagestructuresinfruitsandvegetables-coldstorage,evaporativecoalchamber and traditional field storage structures
CO3	Students are able to know different methods and materials used for packaging of horticultural crops
CO4	Learn about the process of canning and other method of preservation
CO5	Able to understand various losses caused by different mode and their control management.

CO-PO Mapping

	CO	**PO1** Basic Agriculture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations	**PO4** Modern implementation usage	**PO5** Modern Agricultural /Horticultural implements	protectionimplementsimplementsi	**PO7** Extension Program	**PO8** Environment and sustainability	**PO9** Ethics	**PO10** Individual and team work	**PO11** Communication	**PO12** Lifelong learning
CO1	Understand the various methods of post-harvest management and its role in providing better quality produce to the consumer.	3	1	1	2	2	1	2	3				3
CO2	Learn various storagestructuresinfruitsandvegetables-coldstorage,evaporativecoalchamber and traditional field storage structures	3	2		1		1	1	3				3
CO3	Students are able to know different methods and materials used for packaging of horticultural crops	3	2	1	1	2	2	2					3
CO4	Learn about the process of canning and other method of preservation	3	2	1	3	3		3					3
CO5	Able to understand various losses caused by different mode and their control management.	3	2	1	3		2		1				3
3: Strong contribution, 2: average contribution, 1: Low contribution													

Management of Agro-based industry

Course Code: AG 437

Course Objective

1. To impart knowledge and awareness about agro-based industry.
2. To study about the different type of MSMEs in India and their significance for Indian economy.
3. To bring knowledge about the financial management of rural and small scale industries.
4. To understand operation management of the agro-based industries in India.
5. To understand the problem and prospects of small scale industries in India.
6. **Course Outcome:**

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to know about the basics of agro-based industry; different types of industry and their functioning.
CO2	Able to know the importance of cottage village and small scale industries for India's economy.
CO3	Able to know about the basic knowledge of financial managements and financial problems and the reasons of rural and small scale industries.
CO4	Students are able to know about the production planning, working and problems of the rural and small scale industries
CO5	Students are well aware of different reasons for the industrial sickness of the small scale industries in India and what are their future prospects.

CO-PO MAPPING:

	CO	PO1Basic knowledge about Management and Agribusiness Management:	PO2 Problem solving:	PO3 Identification and Designing of research problems:	PO4 Managerial Skills	PO5 Usage of Agribusiness principles and society	PO6 Environment and sustainability:	PO7 Ethics:	PO8 Individual and team work:	PO9 Communication:	PO10 Life-long learning:
CO1	Able to know about the basics of agro-based industry; different types of industry and their functioning.	3	2	2	2	2	1	1	3	3	3
CO2	Able to know the importance of cottage village and small scale industries for India's economy.	3	3	3	2	1	1	1	3	2	3
CO3	Able to know about the basic knowledge of financial managements and financial problems and the reasons of rural and small scale industries.	3	2	2	2	2	1	1	3	2	3
CO4	Students are able to know about the production planning, working and problems of the rural and small scale industries	3	2	2	2	3	1	1	3	2	3
CO5	Students are well aware of different reasons for the industrial sickness of the small scale industries in India and what are their future prospects.	3	3	3	2	2	1	1	3	2	3

Marketing Management (Agriculture Import-Export policy of Govt. of India & Business Laws)

Course Code: AG 438

Course Objective

1. To make students aware about the investment framework in India.
2. To make students aware about the foreign investment and foreign trade and foreign trade policy of India.
3. To impart a knowledge about the various export promotion schemes and measures in India
4. To make students aware about the concept of BoP, economic reforms and business laws of India.
5. To make students aware about the IPR.

Course Outcome:

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students are well aware about the investment framework in India.
CO2	Students are well aware about the FDI, FERA, FEMA and EXIM policy.
CO3	Students have knowledge about EPZ, SEZ, incentives to export and different export promotion schemes.
CO4	Students have knowledge about BoP, economic reforms and business laws of India
CO5	Student can understand IPR, different tools for the protection of intellectual property and laws related to IPR.

CO-PO MAPPING:

	CO	Management and Agribusiness Management:	PO2 Problem solving:	Designing of research problems:	PO4 Managerial Skills	PO5 Usage of Agribusiness principles and society	PO6 Environment and sustainability:	PO7 Ethics:	PO8 Individual and team work:	PO9 Communication:	PO10 Life-long learning:
CO1	Students are well aware about the investment framework in India.	3	2	2	2	2	1	1	2	1	2
CO2	Students are well aware about the FDI, FERA, FEMA and EXIM policy.	3	3	2	2	3	1	1	3	2	3
CO3	Students have knowledge about EPZ, SEZ, incentives to export and different export promotion schemes.	3	1	1	3	2	1	2	3	3	3
CO4	Students have knowledge about BoP, economic reforms and business laws of India	3	2	2	2	3	1	2	2	2	2
CO5	Student can understand IPR, different tools for the protection of intellectual property and laws related to IPR.	3	2	2	3	2	3	3	2	2	3

Financial Management of Agribusiness

Course Code: AG 439

Course Objective

1. To impart knowledge about the financial management and its importance for the business.
2. To make student aware about credit proposal evaluation techniques.
3. To make aware about the procedure and formality of the credit disbursement and different type of repayment plans.
4. To make students aware about the basic accounting techniques used their uses in business.
5. To provide a concept about economics principle applied to business management.

Course Outcome:

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students will well aware about the importance of financial management in the business.
CO2	Students will get the knowledge about the different techniques of the evaluation of a credit proposal.
CO3	Students will aware about the procedure and formality of the credit disbursement and different type of repayment plans.
CO4	Students will able to understand the concept of profit and loss account, balance sheet, net worth statement etc.
CO5	Students will get the knowledge of basic economics principle applied to the financial management.

CO-PO MAPPING:

	CO	PO1Basic knowledge about Management and Agribusiness Management:	PO2 Problem solving:	PO3 Technical and Designing of research problems:	PO4 Managerial Skills	PO5 Usage of Agribusiness principles and society	PO6 Environment and sustainability:	PO7 Ethics:	PO8 Individual and team work:	PO9 Communication:	PO10 Life-long learning:
CO1	Students will well aware about the importance of financial management in the business.	3	3	2	3	1	1	1	2	1	2
CO2	Students will get the knowledge about the different techniques of the evaluation of a credit proposal.	3	3	1	3	1	1	1	2	1	2
CO3	Students will aware about the procedure and formality of the credit disbursement and different type of repayment plans.	3	2	1	3	1	1	1	2	1	1
CO4	Students will able to understand the concept of profit and loss account, balance sheet, net worth statement etc.	3	3	1	2	1	1	1	2	2	2
CO5	Students will get the knowledge of basic economics principle applied to the financial management.	3	2	2	2	1	1	1	3	2	2

Natural Resource Economics and Management
COURSE CODE: AG440

COURSE OBJECTIVES:

- Basic concept of natural resource economics
- Knowledge of natural resource and economic development. Natural condition effecting Indian Agriculture
- Basic knowledge of efficient farm layout, land utilization pattern.
- Basic concepts of Govt. policies in relation to use of natural resource and soil water conservation.
- Principles of Water Resource Management

COURSE OUTCOMES (CO):

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students will have basic knowledge of natural resource economics
CO2	Importance of forest in National Economy
CO3	Knowledge of natural resource and economic development. Natural condition effecting Indian Agriculture
CO4	Basic concepts of Govt. policies in relation to use of natural resource and soil water conservation
CO5	Basic concepts of natural resource and economic development. Natural condition effecting Indian Agriculture

CO-PO MAPPING:

	CO	PO 1. Basic Agriculture knowledge	PO 2. Problem Solving	PO 3. Field Experimentations	PO 4.Modern implementation usage	PO 5.Modern Horticultural implements	PO 6. Modern Plant Protection implements	PO 7. Extension Program	PO 8. Environment and sustainability	PO 9. Ethics	PO 10. Individual and team work
CO1	Students will have basic knowledge of natural resource economics	2	2	1	3	3	2	3	3	1	2
CO2	Importance of forest in National Economy	2	2	1	2	2	2	3	2	1	2
CO3	Knowledge of natural resource and economic development. Natural condition effecting Indian Agriculture	2	2	1	3	3	2	3	2	1	2
CO4	Basic concepts of Govt. policies in relation to use of natural resource and soil water conservation	2	2	1	2	2	2	2	3	1	2
CO5	Basic concepts of natural resource and economic development. Natural condition effecting Indian Agriculture	2	3	1	2	2	2	2	3	1	2
3: Strong contribution, 2: average contribution, 1: Low contribution											

Project Formulation, Evaluation and Monitoring

Course Code: AG441

Course Objectives

1. To introduce the basic knowledge of Time value of Money
2. To introduce the different types of business environment.
3. To make differentiation between B-C Ratio, IRR and NPW
4. To focus on different phases of project.
5. To introduce environmental scanning.

.**Course Outcome:**

After completion of the course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students know the basic knowledge of Time value of Money
CO2	Students have knowledge about different types of business environment.
CO3	Students can easily differentiation between B-C Ratio, IRR and NPW
CO4	Students can easily differentiate between different phases of project.
CO5	Students are familiar with environmental scanning.

CO-PO MAPPING:

	CO	**PO1** Basic Agriculture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations	**PO4** Modern implementation usage	**PO5** Modern Horticultural implements	**PO6** Modernplant protection implements	**PO7** Extension Programme	**PO8** Environment and sustainability	**PO9** Ethics	**PO10** Individual and team work	**PO11** Communication	**PO12** Lifelong learning
CO1	Students know the basic knowledge of Time value of Money	1	3		1				3	3	2	3	3
CO2	Students have knowledge about different types of business environment.	3	3		3				3	2	2	3	2
CO3	Students can easily differentiation between B-C Ratio, IRR and NPW	3	2		1				3	2	1	3	3
CO4	Students can easily differentiate between different phases of project.	3	3		1				2	3	2	3	3
CO5	Students are familiar with environmental scanning.	2	2		2				3	2	2	3	3
3: Strong contribution, 2: average contribution, 1: Low contribution													