M.Sc (Horticulture) Agriculture First Year/ first Semester

Name of Course/Subject: Principles of Fruit Production

Course Code: APH 510

Course objective:

- Importance of fruit production, its classification, soil and climate in relation to fruit production.
- Knowledge about advanced technologies used to grow intensively high quality fruit crops for enhancing the crop production.
- Familiar the students about climate, soil and varieties for fruit crops.
- Knowing the principles and methods of orchard establishment, training, pruning and other horticultural practices needed for fruit production.

Course Outcomes

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Aware about soil management methods and techniques for moisture conservation in fruit crops.
CO2	Students aware about cultural practices for the cultivation of fruit crops
CO3	Students also aware about theflowering physiology and factors involved in fruit-set, unfruitfulness, fruit growth and development.
CO4	Familiar with the important physiological disorders and management.
CO5	Aware about the different propagation techniques applied in horticultural crops including micro-propagation.

	CO	**PO1** Basic horticulture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations	**PO4** Scientific Skills	**PO5** Adoption of Advanced technology	**PO6** Plant protection measures	**PO7** Environment and sustainability	**PO8** Ethics	**PO9** Individual and team work	**PO10**Communication	**PO11**Lifelong learning
CO1	Aware about soil management methods and techniques for moisture conservation in fruit crops.	3	2	1	3	3		3				3
CO2	Students aware about cultural practices for the cultivation of fruit crops	2	3	1	2	3		2				2
CO3	Students also aware about theflowering physiology and factors involved in fruit-set, unfruitfulness, fruit growth and development.	3	2			3	1	3				3
CO4	Familiar with the important physiological disorders and management.	3	2	1	3	3	2	2				1

Name of Course/Subject: Fruit Plant Propagation and Nursery Management

Course Code: APH511

Course objective:

- To impart knowledge to the students on plant propagation by sexual and asexual method of propagation
- To impart knowledge to the students on physiological and anatomical aspects of plant propagation
- To impart basic knowledge of plant propagating structure
- To know about role of plant growth regulators on 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	Learn about the process of graft union
CO3	Students are able to know about role of green house in propagation of plants
CO4	Students are able to know about role of plastic in propagating structure
CO5	Study about different rootstock used for budding and grafting

CO-PO mapping

	CO	**PO1** Basic horticulture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations		**PO5** Adoption of Advanced technology	**PO6** Plant protection measures	**PO7** Environment and sustainability	**PO8** Ethics	**PO9** Individual and team work	**PO10**Communication	**PO11**Lifelong learning
CO1	Study about the different methods of cutting, budding, layering and grafting	3	3	2	3	3		3				3
CO2	Learn about the process of graft union	2	2	1	2	3		2				2
CO3	Students are able to know about role of green house in propagation of plants	3	3	2		3	1	3				3
CO4	Students are able to know about role of plastic in propagating structure	3	2	2	3	3	2	2				1
CO5	Study about different rootstock used for budding and grafting	3	3	3	1	3	1	3				3
3: Strong contribution, 2: average contribution, 1: Low contribution												

Name of Course/ Subject: Fundamentals of Processing of Fruit and Vegetables

Course Code: APH515

Course Objective

- To impart knowledge to the student on the role and importance of post harvest management of fruit and vegetables
- To impart knowledge to the student on the principles and various methods of preservation
- To impart knowledge to the student on the making of different products
- To used knowledge in preservation of processed commodity for long time

COURSE OUTCOME (CO)

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Study about the history and importance of preservation for food industry
CO2	Learn about the process of canning and other method of preservation
CO3	Students are able to know about role of microorganism and enzymes in preservation
CO4	Study about food laws, HACCP, Hygiene and sanitation
CO5	Students are able to know different methods of packaging and storage

CO-PO Mapping

	CO	**PO1** Basic horticulture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations		**PO5** Adoption of Advanced technology	**PO6** Plant protection measures	**PO7** Environment and sustainability	**PO8** Ethics	**PO9** Individual and team work	**PO10**Communication	**PO11**Lifelong learning
CO1	Study about the history and importance of preservation for food industry	3	3			3		3			2	2
CO2	Learn about the process of canning and other method of preservation	3	3		3	3		3		2	1	3
CO3	Students are able to know about role of microorganism and enzymes in preservation	3	1		3	3		2				2
CO4	Study about food laws, HACCP, Hygiene and sanitation	3	2		3			3	2			3
CO5	Students are able to know different methods of packaging and storage	3	3		3	3		3	1			1
3: Strong contribution, 2: average contribution, 1: Low contribution												

Name of Course/ Subject: Production Technology of Cool Season Vegetable Crops

Course Code: AG504

Course objective

- To know about Soil and Climate requirement of Cool Season Vegetables
- Familiar with different varieties and methods of sowing in different vegetables.
- Knowledge of Seed production technology of cool season vegetable
- Knowledge of crop protection measure in different crops

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 selection of soil and climate for vegetable crops
CO2	Can use the basic knowledge regarding different cultural practices followed for cool season vegetables
CO3	Students are able to know about sowing time of different varieties according to temperature
CO4	Study of irrigation and nutrient management and their applications in production vegetables
CO5	By the end of course students will be able to control of different insect pests.

CO-PO MAPPING

	CO	**PO1** Basic horticulture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations		**PO5** Adoption of Advanced technology	**PO6** Plant protection measures	**PO7** Environment and sustainability	**PO8** Ethics	**PO9** Individual and team work	**PO10**Communication	**PO11**Lifelong learning
CO1	Able to know what are the basic criteria for selection of soil and climate for vegetable crops	3	3	2	2	3		3		1	1	3
CO2	Can use the basic knowledge regarding different cultural practices followed for cool season vegetables	3	3	3	2	3	3	3				2
CO3	Students are able to know about sowing time of different varieties according to temperature	3	3	2		3	1	3				3
CO4	Study of irrigation and nutrient management and their applications in production vegetables	3	3	3	3		2	3				3
CO5	By the end of course students will be able to control of different insect pests.	3	3	3	3	1	3	3	1			3
1: Low contribution, 2: average contribution, 3: Strong contribution												

Name of Course/Subject: Production Technology of Underexploited vegetables crops

Course Code: AG 505

Course objective:

- To know about origin, geographical distribution, soil and climate requirement of underexploited vegetable crops.
- Familiar with different improved varieties and methods of sowing in different under exploited vegetables.
- Knowledge of various inter cultural operations and their management for under exploited vegetable crops.
- Knowledge of crop protection measure in different under exploited vegetables.

Course Outcome

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Able to understand about the basic criteria for selection of under exploited vegetable crops on the basis of soil and climate requirement.
CO2	Learn the basic knowledge regarding different cultural practices followed for underutilized vegetable crops
CO3	Able to know about sowing time of specific varieties for different under exploited vegetables according to region and season.
CO4	Study of irrigation and nutrient management and their applications in production of under exploited vegetable crops
CO5	By the end of course students will be able to know different physiological disorders of under exploited vegetables and can control different insect pests and diseases.

CO-PO mapping

	CO	**PO1** Basic horticulture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations		**PO5** Adoption of Advanced technology	**PO6** Plant protection measures	**PO7** Environment and sustainability	**PO8** Ethics	**PO9** Individual and team work	**PO10**Communication	**PO11**Lifelong learning
CO1	Able to understand about the basic criteria for selection of under exploited vegetable crops on the basis of soil and climate requirement.	3	3	2	3	2		3				3
CO2	Learn the basic knowledge regarding different cultural practices followed for underutilized vegetable crops	2	2	1	2	2		2				2
CO3	Able to know about sowing time of specific varieties for different under exploited vegetables according to region and season.	3	3	2		2	1	3				3
CO4	Study of irrigation and nutrient management and their applications in production of under exploited vegetable crops	3	2	2	2	2	2	2				1
CO5	By the end of course students will be able to know different physiological disorders of under exploited vegetables and can control different insect pests and diseases.	3	3	3	1	2	1	3				3
3: Strong contribution, 2: average contribution, 1: Low contribution												

COURSE:Experimental Designs

COURSE CODE: MT519

COURSE OBJECTIVES:

- Basic concepts of Experiments, designs and analysis of covariance
- Comparative experiments, need for designing of experiments
- In depth knowledge of principles of design of experiment: randomization, replication and local control
- Knowledge of completely randomized design, Randomized Block Design and Latin square design and their analysis of variance
- Balanced Incomplete Block Design (BIBD) and its parameters
- Analysis of missing plot design (Fisher's Rule),analysis of Randomized Block Design with one missing observation

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 Experiments, designs and analysis of covariance
CO2	Students will have knowledge of Comparative experiments
CO3	The students will be able to prepare their experimental fields on the basis of designs
CO4	Students can have the knowledge of completely Randomized Design, Randomized Block Design and Latin square design and their analysis of variance
CO5	Students can analyze their results according to the designs

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	Students will have basic knowledge of Experiments, designs and analysis of covariance	2	3	2	2	2	2	1	1	2	2	1	3
CO2	Students will have knowledge of Comparative experiments	2	3	2	2	2	2	1	1	1	3	1	3
CO3	The students will be able to prepare their experimental fields on the basis of designs	2	3	2	2	2	2	1	1	2	3	1	3
CO4	Students can have the knowledge of completely Randomized Design, Randomized Block Design and Latin square design and their analysis of variance	2	3	2	2	2	2	1	1	2	3	1	3
CO5	Students can analyze their results according to the designs	2	3	2	2	2	2	1	1	2	3	1	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

COURSE: Intellectual Property and Its Management in Agriculture

COURSE CODE: PGS 503 (e-course)

COURSE OBJECTIVES:

- Knowledge, concept and introduction of Intellectual Property Right regime; TRIPs and various provisions in TRIPS Agreement
- Basics of Legislations for the protection of various types of Intellectual Properties
- Fundamentals of patents, copyrights, geographical indications, designs and layout
- Basic concepts of Protection of plant varieties and farmers' rights and bio-diversity protection, Convention on Biological Diversity; International Treaty on Plant Genetic Resources for Food and Agriculture
- Study of Licensing of technologies, Material transfer agreements, Research collaboration Agreement, License Agreement

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Concept of Intellectual Property Right regime; TRIPs and various provisions in TRIPS Agreement
CO2	Knowledge of Legislations for the protection of various types of Intellectual Properties
CO3	Concepts of Protection of plant varieties and farmers' rights and bio-diversity protection, Convention on Biological Diversity; International Treaty on Plant Genetic Resources for Food and Agriculture
CO4	Knowledge of Convention on Biological Diversity; International Treaty on Plant Genetic Resources for Food and Agriculture
CO5	Knowledge of Socio-economic impact, Research collaboration Agreement, License Agreement

CO-PO MAPPING:

	CO	PO 1. Basic Agronomy knowledge	PO 2. Research	PO 3. Field Experiments	PO 4.Modern implementation usage	PO 5.Modern concepts of crop production	PO 6. Modern farming system	PO 7. Soil-water-plant relationship	PO 8. Environment and sustainability	PO 9. Ethics	PO 10. Individual and team work	PO 11. Communication	PO 12. Life-long learning
CO1	Concept of Intellectual Property Right regime; TRIPs and various provisions in TRIPS Agreement	2	3	3	3	1	1	1	3	3	2	3	3
CO2	Knowledge of Legislations for the protection of various types of Intellectual Properties	2	3	2	2	1	1	1	1	2	3	1	3
CO3	Concepts of Protection of plant varieties and farmers' rights and bio-diversity protection, Convention on Biological Diversity; International Treaty on Plant Genetic Resources for Food and Agriculture	3	3	3	3	1	1	2	2	3	3	2	3
CO4	Knowledge of Convention on Biological Diversity; International Treaty on Plant Genetic Resources for Food and Agriculture	3	3	2	2	1	1	1	1	2	3	3	3
CO5	Knowledge of Socio-economic impact, Research collaboration Agreement, License Agreement	3	3	2	3	1	1	1	3	3	3	3	1
3: Strong contribution, 2: average contribution, 1: Low contribution													

COURSE:Basic Concepts in Laboratory Techniques
COURSE CODE: PGS504

COURSE OBJECTIVES:

- Basic concepts of Safety measures while handling instruments, chemicals, glasswares, etc. in lab
- Use of different instruments, chemicals, glasswares, etc. of lab
- Preparation of different agrochemical doses in field and pot applications
- Preparation of buffers of different strengths and pH values
- Preparation of media and methods of sterilization
- Seed viability testing, testing of pollen viability

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 handling and safety measures of instruments, chemicals, glasswares, etc. in lab before and after use
CO2	Students will have knowledge of usage of different type of lab equipments, instruments, glasswares, plasticwares, etc.
CO3	The students will be able to prepare different agrochemical doses in field and pot applications
CO4	Students can have the knowledge to prepare media, acid and bases of different strengths and buffer solutions
CO5	Students can also perform seed and pollen viability testing

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	Students will have basic knowledge of handling and safety measures of instruments, chemicals, glasswares, etc. in lab before and after use	2	2	2	2	1	2	1	2	2	2	1	3
CO2	Students will have knowledge of usage of different type of lab equipments, instruments, glasswares, plasticwares, etc.	2	2	2	2	1	2	1	2	1	2	1	3
CO3	The students will be able to prepare different agrochemical doses in field and pot applications	3	3	3	2	1	2	1	2	2	2	1	3
CO4	Students can have the knowledge to prepare media, acid and bases of different strengths and buffer solutions	3	3	3	2	1	2	1	2	2	2	1	3
CO5	Students can also perform seed and pollen viability testing	3	3	3	2	2	2	1	2	2	2	1	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

COURSE: e-Agriculture
COURSE CODE:PGS-507

COURSE OBJECTIVES:

1.To gain basic knowledge of e-Agriculture

2. The aim of improving communication and learning processes between various sectors in agriculture locally, regionally and worldwide

3. They gain knowledge to increase the production and productivity of Agriculture

4. Type of education and Agricultural Journalism

5. Knowledge of Innovative Information sources

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Use of Information and Communication Technology in Agriculture
CO2	Know about Online Agricultural resources, e-agriculture community
CO3	Know about Centre for Agricultural Bioinformatics, national Agricultural Bioinformatics Grid.
CO4	Knowledge of education and their Characteristics and Agricultural Journalism
CO5	Knowledge of contact methods, Kissan Call center and e-Chaupal.

CO-PO MAPPING:

	CO	**PO1**.Basic Agronomy Concepts	**PO2** .Research	**PO3** .Field Experiments	**PO4.**Modern implementation u usage	**PO5** .Modern concepts of crop production	**PO6** .Modern farming system	**PO7** Soil-water-plant relationship	**PO8** .Environment and sustainability	**PO9.**Ethics	**PO10** .Individual and team work	**PO11**.Communication F	**PO12** Lifelong learning
CO1	Use of Information and Communication Technology in Agriculture	3	3	2	1	1	3	1	1	1	3	3	3
CO2	Know about Online Agricultural resources, e-agriculture community	3	3	2	2	1	1	1	2	2	2	3	2
CO3	Know about Centre for Agricultural Bioinformatics, national Agricultural Bioinformatics Grid.	3	3	1	1	2	2	1	2	2	3	3	3
CO4	Knowledge of education and their Characteristics and Agricultural Journalism	3	3	1	2	3	1	2	1	1	2	3	2
CO5	Knowledge of contact methods, Kissan Call center and e-Chaupal.	3	3	1	1	1	1	1	1	1	2	3	2
3: Strong contribution, 2: average contribution, 1: Low contribution													

Name of Course/Subject: Production Technology for Medicinal and Aromatic Crops

Course Code: APH512

Course objective:

1. Knowledge about the importance of aromatic, medicinal crops, their industries and export and import status.
2. Study about the production technology of medicinal and aromatic crops..
3. Study about the post-harvest handling, distillation methods and advanced methods for aromatic and medicinal crops.
4. Study of production technology of Herbal industry also.

Course Outcome

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students have basic knowledge about cultivation methods for medicinal and aromatic plants
CO2	Able to know about different medicinal properties of medicinal plants and their use
CO3	Students are able to know aromatic plants and their use
CO4	Learn about the post-harvest handling like drying, processing, grading, packing and storage.
CO5	Aware about basic distillation methods, solvent extraction process and steam distillation

CO-PO mapping

	CO	**PO1** Basic horticulture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations		**PO5** Adoption of Advanced technology	**PO6** Plant protection measures	**PO7** Environment and sustainability	**PO8** Ethics	**PO9** Individual and team work	**PO10**Communication	**PO11**Lifelong learning
CO1	Students have basic knowledge about cultivation methods for medicinal and aromatic plants	3	3	1	3	3		3				3
CO2	Able to know about different medicinal properties of medicinal plants and their use	2	2	1	2	3		2				2
CO3	Students are able to know aromatic plants and their use	3	3					3				3
CO4	Learn about the post-harvest handling like drying, processing, grading, packing and storage.	3	2	1	3	3	2	2				1
CO5	Aware about basic distillation methods, solvent extraction process and steam distillation	3	3	1	1	3	1	3				3
3: Strong contribution, 2: average contribution, 1: Low contribution												

Fundamentals of Processing of Fruit and Vegetables

Course code: APH513

Course Objective

1. To gain basic knowledge of fruit production
2. To gain basic knowledge regarding role of rootstock on fruit production
3. To know about the principles and different methods of propagation of fruit crops
4. To know about the nutrient and water management in fruit production.

COURSE OUTCOME (CO)

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Study about the botanical description, floral biology of fruit crops
CO2	Learn about the propagation method and different rootstock of fruit crops
CO3	They can know about deficiency of nutrients and their management
CO4	Study about different variety suitable for high density planting
CO5	They can know about maturity indices and post harvest techniques

CO-PO MAPPING

	CO	**PO1** Basic horticulture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations		**PO5** Adoption of Advanced technology	**PO6** Plant protection measures	**PO7** Environment and sustainability	**PO8** Ethics	**PO9** Individual and team work	**PO10**Communication	**PO11**Lifelong learning
CO1	Study about the botanical description, floral biology of fruit crops	3	3	3	1			1		1	3	2
CO2	Learn about the propagation method and different rootstock of fruit crops	3	3	2	3	2	1	2		2	2	3
CO3	They can know about deficiency of nutrients and their management	3	3	3	3	3	2	2		1	2	2
CO4	Study about different variety suitable for high density planting	2	2	3	1	3	2	2			2	3
CO5	They can know about maturity indices and post harvest techniques	3	3	2	2	2	1	3	1			1
3: Strong contribution, 2: average contribution, 1: Low contribution												

Production Technology of Ornamental Plant

Course Code: APH517

Course objective:

1. Knowledge about the importance of field flowers, foliage, pot plants and its potential in global market.
2. Study about the commercial production technology minor cut flowers crops.
3. Study about the post-harvest handling, distillation methods and advanced methods of oil yielding flowers.
4. Study of production technology of orchid and anthurium culture also.

Course Outcome

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students have basic knowledge about present status of floriculture in India
CO2	Able to know about different field flowers, bulbous, foliage and pot plants.
CO3	Students are different culture practices for major and minor flowers.
CO4	Learn about the post-harvest handling like drying, processing, grading, packing and storage.
CO5	Aware about basic distillation methods, solvent extraction process and steam distillation of oil yielding flowers.

CO-PO mapping

	CO	**PO1** Basic horticulture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations		**PO5** Adoption of Advanced technology	**PO6** Plant protection measures	**PO7** Environment and sustainability	**PO8** Ethics	**PO9** Individual and team work	**PO10**Communication	**PO11**Lifelong learning
CO1	Students have basic knowledge about present status of floriculture in India	3	3	1	3	3		3				3
CO2	Able to know about different field flowers, bulbous, foliage and pot plants.	2	2	1	2	3		2				2
CO3	Students are different culture practices for major and minor flowers.	3	3					3				3
CO4	Learn about the post-harvest handling like drying, processing, grading, packing and storage.	3	2	1	3	3	2	2				1
CO5	Aware about basic distillation methods, solvent extraction process and steam distillation of oil yielding flowers.	3	3	1	1	3	1	3				3
3: Strong contribution, 2: average contribution, 1: Low contribution												

Name of Course/ Subject: Nutrition of fruit crops

Course Code: APH518

Course Objective

1. **To impart knowledge to the student on the role and importance of nutrient on fruit crops**
2. **To impart knowledge to the student on the essential nutrients**
3. **To impart knowledge to the student on the making of different nutritional disorders**
4. **To used knowledge of biofertilizer and integrated nutrient management on fruit crops**

COURSE OUTCOME (CO)

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Study about the role and importance of macro and micro nutrients
CO2	Learn about the process of nutrient uptake and translocation
CO3	Students are able to know about nutritional requirement of fruit crops
CO4	Study about availability of nutrients in manure and fertilizer
CO5	Students are able to know different methods of vermiculture and vermicomposting

CO-PO Mapping

	CO	PO1 Basic horticulture knowledge	PO2 Problem Solving	PO3 Field Experimentations	PO4 Scientific Skills	PO5 Adoption of Advanced technology	PO6 Plant protection measures	PO7 Environment and sustainability	PO8 Ethics	PO9 Individual and team work	PO10 Communication	PO11 Lifelong learning
CO1	Study about the role and importance of macro and micro nutrients	3	3	2		3		**3**			**2**	**2**
CO2	Learn about the process of nutrient uptake and translocation	3	3		3	3		**3**		**2**	**1**	**3**
CO3	Students are able to know about nutritional requirement of fruit crops	3	1	3	3	3		**2**				**2**
CO4	Study about availability of nutrients in manure and fertilizer	3	2		3			**3**	**2**			**3**
CO5	Students are able to know different methods of vermiculture and vermicomposting	3	3		3	3		**3**	**1**			**1**

3: Strong contribution, 2: average contribution, 1: Low contribution

Production Technology of Warm Season Vegetable Crops

Course Code: AG 511

Course objective:

1. To give knowledge about importance and scope of vegetables in human nutrition.
2. To know about origin, geographical distribution, soil and climate requirement of warm Season vegetable crops.
3. Familiar with different improved varieties and methods of sowing in different warm Season vegetable crops.
4. Knowledge of various inter cultural operations and their management for warm season vegetables.
5. Knowledge of crop protection measure in different crops

Course Outcome

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students aware about the suitability of soil and climatic conditions for particular crops.
CO2	Students aware about varieties of warm season vegetable crops and their specific characteristics features
CO3	Aware about the time of sowing, nursery preparation and methods and time of transplanting followed in warm season vegetable crops.
CO4	Familiar with the harvesting techniques, processing, storage and marketing of warm season vegetable crops.
CO5	By the end of course students will be able to know different physiological disorders and can control different insect pests and diseases.

CO-PO mapping

	CO	**PO1** Basic horticulture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations		**PO5** Adoption of Advanced technology	**PO6** Plant protection measures	**PO7** Environment and sustainability	**PO8** Ethics	**PO9** Individual and team work	**PO10**Communication	**PO11**Lifelong learning
CO1	Students aware about the suitability of soil and climatic conditions for particular crops.	3	3	2	2	2	2	2	3			3
CO2	Students aware about varieties of warm season vegetable crops and their specific characteristics features	3	3	3	2	2	2	1	3			3
CO3	Aware about the time of sowing, nursery preparation and methods and time of transplanting followed in warm season vegetable crops.	3	3	2	2	2	3	2	3			3
CO4	Familiar with the harvesting techniques, processing, storage and marketing of warm season vegetable crops.	3	3	3	1		2	2	3			3
CO5	By the end of course students will be able to know different physiological disorders and can control different insect pests and diseases.	3	3		2		2		3			3
3: Strong contribution, 2: average contribution, 1: Low contribution												

Breeding of Vegetable Crops

Course Code: AG 512

Course Objective

1. To acquaint students with the knowledge of different methods of vegetable breeding and its use in crop improvement

2. To introduce the knowledge of use of different molecular techniques in vegetable breeding

3. To introduce the knowledge of different biosafety regulations of vegetable breeding

Course Outcome:

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Know the different methods of vegetable breeding
CO2	Know the different molecular approaches used in vegetable breeding
CO3	know the different methods of vegetable breeding
CO4	This course will sensitize the learners about the different methods of vegetable crops reproduction and conditions favoring them .
CO5	Know the different biosafety regulations of vegetable breeding

CO-PO MAPPING:

	Know the different methods of vegetable breeding	**PO1** Basic Genetic and plant breeding knowledge	**PO2** Problem Solving	**PO3** Identification and designing of research problems		**PO5** The Plant breeder and society	**PO6** Environment and sustainability	**PO7** Ethics	**PO8** Individual and team work	**PO9** Communication	**PO10** Lifelong learning
CO1	Know the different molecular approaches used in vegetable breeding	3	3	2	3		3	1	1	2	3
CO2	know the different methods of vegetable breeding	3	2	3	2		2	1	3	1	3
CO3	This course will sensitize the learners about the different methods of vegetable crops reproduction and conditions favoring them .	3	3	2	3		1	1	2	1	3
CO4	Know the different biosafety regulations of vegetable breeding	3	2	3	2		3	1	3	1	3
CO5	Know the different methods of vegetable breeding	3	1	3	3		2	3	3	2	3
3: Strong contribution, 2: average contribution, 1: Low contribution											

Writing and communication skills

Subject Code: PGS502

Course objective

1. To give knowledge about the various forms of scientific writings
2. To give knowledge about the various parts of thesis, research communications
3. To give knowledge about writing of abstracts, summaries, citations etc
4. To give knowledge about research communications, illustrations, photograph, drawings
5. To give knowledge about pagination, scientific write ups, editing and proof reading, and writing of review article

Course Outcome

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Learn that what are the various forms of scientific writings
CO2	Learn how to write the various parts of thesis, research communications
CO3	Learn how todowriting of abstracts, summaries and what are citations etc
CO4	Learn research communications, illustrations, photograph, drawings
CO5	Learn pagination, scientific write ups, editing and proof reading, and writing of review article

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	Learn that what are the various forms of scientific writings	3	3	1	2	0		2		1	1	3
CO2	Learn how to write the various parts of thesis, research communications	3	3	1	2	0	3	2				2
CO3	Learn how to do writing of abstracts, summaries and what are citations etc	3	3	1		0	1	2				3
CO4	Learn research communications, illustrations, photograph, drawings	3	3	2	3		2	2				3
CO5	Learn pagination, scientific write ups, editing and proof reading, and writing of review article	3	3	2	3		3	2	1			3
1: Low contribution, 2: Average contribution, 3: Strong contribution												

Agriculture Research, Research Ethics and Rural Development Programmes – PGS505

Objectives:

- Appreciate the objective and principle of extension education
- Obtain idea on various development programmes in agriculture and allied area to help farmers.
- To enlighten the students about the organization and functioning of agricultural research systems at national and international levels, research ethics, and rural development programmes and policies of Government.

Outcomes:

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students capable, efficient and self-reliant in character. .
CO2	They gain knowledge to help rural families in better appreciation of SWOT in the village.
CO3	They know about to open new opportunities for developing talents and leadership of rural people.
CO4	To provide knowledge and help for better management of farms and increase incomes.
CO5	To promote better social, natural recreational intellectual and spiritual file among the people.

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** ExtensionProgramme	**PO8** Environment and sustainability	**PO9** Ethics	**PO10** Individual and team work	**PO11** Communication	**PO12** Lifelong learning
CO1	Students capable, efficient and self-reliant in character.	3	1	2	1	1	3	3	3	2	3	1	3
CO2	They gain knowledge to help rural families in better appreciation of SWOT in the village.	3	3	3	1	1	3	3	3	2	3	3	2
CO3	They know about to open new opportunities for developing talents and leadership of rural people.	3	2	1	1	1	2	3	3	2	1	2	3
CO4	To provide knowledge and help for better management of farms and increase incomes.	3	2	2	2	1	3	3	3	2	2	3	3
CO5	To promote better social, natural recreational intellectual and spiritual file among the people.	3	1	1	1	1	2	3	3	2	2	3	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

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Disaster Management

Course Code: PGS506 (e-Course)

Course objective

1. To give knowledge prompt assistance to victims
2. To give knowledge about the different techniques and to achieve rapid and effective recovery.
3. To give knowledge about how to reduce, or avoid, the potential losses from hazards,
4. To give knowledge about assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery

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 disaster management
CO2	Can use the basic knowledge regarding prompt assistance to victims
CO3	Students are able to know about to reduce, or avoid, the potential losses from hazards
CO4	Study toassure prompt and appropriate assistance to victims of disaster and pollution
CO5	By the end of course students will be able to know the knowledge regarding different methods to control and to avoid disaster.

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 disaster management	3	3	1	2	0		2		1	1	3
CO2	Can use the basic knowledge regarding prompt assistance to victims	3	3	1	2	0	3	2				2
CO3	Students are able to know about to reduce, or avoid, the potential losses from hazards	3	3	1		0	1	2				3
CO4	Study to assure prompt and appropriate assistance to victims of disaster and pollution	3	3	2	3		2	2				3
CO5	By the end of course students will be able to know the knowledge regarding different methods to control and to avoid disaster.	3	3	2	3		3	2	1			3
1: Low contribution, 2: Average contribution, 3: Strong contribution												