M.Sc (Agronomy) Agriculture First Year/ First Semester (I/I)

COURSE: Modern Concept in Crop Production
COURSE CODE: APA510
COURSE OBJECTIVES:

- Knowledge and concept of different techniques of crop production
- Basics of crop growth in relation to environment and sustainability
- Knowledge of tillage (zero and minimum tillage)
- Basic concepts of crop modelling for maximizing crop yield
- Study of Cropping and farming systems for sustainable agriculture

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Crop production techniques and crop growth in relation to environment
CO2	Zero and minimum tillage: their basics and application
CO3	Precision agriculture and Precision farming, their concepts and application
CO4	Biotic and a biotic stresses; concept of ideal plant type
CO5	Basics and application crop production under protective agriculture

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	Crop production techniques and crop growth in relation to environment	3	3	2	2	3	2	3	3	3	2	2	3
CO2	Zero and minimum tillage: their basics and application	2	3	2	2	2	2	2	1	2	1	2	2
CO3	Precision agriculture and Precision farming, their concepts and application	3	3	3	3	3	3	2	2	3	1	2	3
CO4	Biotic and a biotic stresses; concept of ideal plant type	3	3	2	2	2	2	1	1	2	1	3	3
CO5	Basics and application crop production under protective agriculture	2	2	3	3	2	2	2	3	3	2	2	2
3: Strong contribution, 2: average contribution, 1: Low contribution													

Principles and Practices of Weed Management
COURSE CODE: APA511
COURSE OBJECTIVES:

- Knowledge and concept of weeds (classification and characters)
- Basics of weed growth in relation to environment and sustainability
- Classification of herbicides, bio-herbicides and biological control of weeds
- Basic concepts and effect of degradation of herbicides in soil and plants, weed management
- Study of weed shifts in cropping systems and control of weed in non-cropped situations.

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Classification, charactersand concept of weeds
CO2	Weed growth in relation to environment and sustainability
CO3	Herbicides, bio-herbicides- their classification and biological control of weeds
CO4	Weed shifts in cropping systems- concept and management
CO5	control of weed in non-cropped situations using different methods

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	Classification, charactersand concept of weeds	2	2	2	3	3	2	2	3	2	2	2	3
CO2	Weed growth in relation to environment and sustainability	3	3	2	3	2	2	2	1	2	1	3	2
CO3	Herbicides, bio-herbicides- their classification and biological control of weeds	2	3	3	2	2	1	3	2	3	2	2	3
CO4	Weed shifts in cropping systems- concept and management	2	3	2	3	2	3	1	1	2	1	3	3
CO5	control of weed in non-cropped situations using different methods	2	2	2	3	2	3	2	3	3	2	2	2
3: Strong contribution, 2: average contribution, 1: Low contribution													

COURSE: Organic Farming
COURSE CODE: APA525
COURSE OBJECTIVES:

- Knowledge and concept of organic farming
- Basics of soil fertility, nutrient cycle manures and soil biota
- Knowledge of weeds and their control in agricultural crops
- Basic concepts of marketing and export potential, certification and lebeling
- Study of Cropping and farming systems for sustainable agriculture

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Concept of organic farming including its relevance to India and global agriculture and future prospects
CO2	Knowledge of soil fertility, nutrient cycle manures and soil biota (earthworms and vermicompost)
CO3	Concepts of marketing and export potential, certification and lebeling
CO4	Knowledge of cropping and farming systems for sustainable agriculture
CO5	Knowledge of Socio-economic impact, Organic farming and national economy

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 organic farming including its relevance to India and global agriculture and future prospects	3	3	3	3	3	3	3	3	3	2	2	3
CO2	Knowledge of soil fertility, nutrient cycle manures and soil biota (earthworms and vermicompost)	3	2	2	2	2	2	3	1	2	2	2	3
CO3	Concepts of marketing and export potential, certification and lebeling	3	2	3	3	3	3	2	2	3	2	2	3
CO4	Knowledge of cropping and farming systems for sustainable agriculture	3	3	2	2	2	2	1	1	2	2	3	3
CO5	Knowledge of Socio-economic impact, Organic farming and national economy	3	2	3	3	2	2	3	3	3	2	3	1
3: Strong contribution, 2: average contribution, 1: Low contribution													

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													

Soil Fertility and its Nutrient Management, APS 526

Objectives:

- To gain basic knowledge of soil fertility and productivity
- To study Importance or Significance of soil macronutrient and micronutrients
- To Assess and develop importance of soil physical and chemical properties
- To study about soil pollution and mitigation process

Outcome:

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	To gain basic knowledge of soil fertility and productivity
CO2	To study Importance or Significance of soil macronutrient and micronutrients
CO3	To Assess and develop importance of soil physical and chemical properties
CO4	To study about soil pollution and mitigation process
CO5	To study about soil pollution and mitigation process

CO-PO MAPPING:

	CO	**PO1** Basic Agriculture knowledge	**PO2** Problem Solving	**PO3** Field Experimentations	**PO4** Modern implement usage	**PO5** Modern Agriculture/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	To gain basic knowledge of soil fertility and productivity	3	1	2	1	1	3	3	3		3	1	3
CO2	To study Importance or Significance of soil macronutrient and micronutrients	3	3	3	1		3	3	3		3	3	2
CO3	To Assess and develop importance of soil physical and chemical properties	3	2	1	1		2	3	3	1	1	2	3
CO4	To study about soil pollution and mitigation process	3	2	2	2		3	3	3		2	3	3
CO5	To study about soil pollution and mitigation process	3	1	1	1	1	2	3	3		2	3	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

Agronomy of Major Field Crop (Kharif)
COURSE CODE: APA514
COURSE OBJECTIVES:

- Knowledge and concept of major field crops (including cereals, pulses, oilseeds and fiber crops)
- Basics of soil requirements for field crops including fertilizers, manures, Farm yard manures
- Knowledge of seed rates, morphology phenology, varietal improvement of crops
- Basic concepts of origin,history,distribution,adaptations of different crops according to the environment
- Study of sustainable agriculture and cropping and farming systems

COURSE OUTCOMES (CO):

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Concept of major field crops (including cereals, pulses, oilseeds and fiber crops)
CO2	Knowledge of farm yard manures soil requirements for field crops including fertilizers, manures,
CO3	Basics if origin,history,distribution,adaptations of different crops according to the environment
CO4	In-depth knowledge of sustainable agriculture and cropping and farming systems
CO5	In-depth knowledge of production technology

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 major field crops (including cereals, pulses, oilseeds and fiber crops)	2	2	3	3	3	3	3	3	3	2	2	2
CO2	Knowledge of farm yard manures soil requirements for field crops including fertilizers, manures,	3	2	1	2	2	2	3	2	2	3	2	2
CO3	Basics if origin,history,distribution,adaptations of different crops according to the environment	2	2	3	3	3	3	2	3	3	3	2	3
CO4	In-depth knowledge of sustainable agriculture and cropping and farming systems	3	3	2	2	2	2	1	3	2	2	3	3
CO5	In-depth knowledge of production technology	3	2	3	2	2	1	1	3	2	2	3	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

Intellectual Property and Its Management in Agriculture

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													

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													

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													

M.Sc.(Ag) Agronomy II semester

Principles and Practices of water management

Paper code: APA 512

Course objective:

- To study about the water resources of India
- To study about the different irrigation projects, soil water plant relationship
- To know about the water management crop and cropping systems and management of crops
- To know the effect of excess water on plant growth, drainage requirements of crop, layout and special irrigability of lands

Course Outcome

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Know the water resources of India
CO2	Know the different irrigation projects, soil water plant relationship
CO3	Understand the water management crop and cropping systems and management of crops
CO4	Understand the plant adaptation to moisture stress condition quality of irrigation water
CO5	Understand the effect of excess water on plant growth, drainage requirements of crop, layout and special irrigability of lands

	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	Know the water resources of India	2	2	3	3	3	3	3	3	3	2	2	2
CO2	Know the different irrigation projects, soil water plant relationship	3	2	1	2	2	2	3	2	2	3	2	2
CO3	Understand the water management crop and cropping systems and management of crops	2	2	3	3	3	3	2	3	3	3	2	3
CO4	Understand the plant adaptation to moisture stress condition quality of irrigation water	3	3	2	2	2	2	1	3	2	2	3	3
CO5	Understand the effect of excess water on plant growth, drainage requirements of crop, layout and special irrigability of lands	3	2	3	2	2	1	1	3	2	2	3	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

Soil fertility management and fertilizer use

Paper code: APA 513

Course objective:

- To study about the soil fertility and productivity
- To study about the soil composition and deficiency and toxicity symptoms of major and micronutrients
- To know about the transformations and dynamic of major plant nutrients, different types of fertilizer and their application
- To know about the vermicompost, biofertilizers and sustainable agriculture

Course Outcome

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Know the soil fertility and productivity
CO2	know soil composition and deficiency and toxicity symptoms of major and micronutrients
CO3	understand transformations and dynamic of major plant nutrients, different types of fertilizer and their application
CO4	Understand fertilizer use efficiency, nutrient interaction and integrated plant nutrient supply system
CO5	To know about the vermicompost, biofertilizers and sustainable agriculture

	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	Know the soil fertility and productivity	2	2	3	3	3	3	3	3	3	2	2	2
CO2	know soil composition and deficiency and toxicity symptoms of major and micronutrients	3	2	1	2	2	2	3	2	2	3	2	2
CO3	understand transformations and dynamic of major plant nutrients, different types of fertilizer and their application	2	2	3	3	3	3	2	3	3	3	2	3
CO4	Understand fertilizer use efficiency, nutrient interaction and integrated plant nutrient supply system	3	3	2	2	2	2	1	3	2	2	3	3
CO5	To know about the vermicompost, biofertilizers and sustainable agriculture	3	2	3	2	2	1	1	3	2	2	3	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

Fodder and Forage Crop

Paper code: APA 517

Course objective:

- To study about the adaptation, distribution, agro techniques, anti-quality factors of improvement of fodder crops
- To study about the preservation and utilization of forage and pasture crops
- To know about the use of physical and chemical enrichment and biological methods for improvement nutrition
- To know about the economics of forage cultivation, grassland of India and their improvement
- To know about the principles of grassland ecology, economic aspect of grassland, problems and their management

Course Outcome

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	know about the adaptation, distribution, agro techniques, anti-quality factors of improvement of fodder crops
CO2	know about the preservation and utilization of forage and pasture crops
CO3	Understand the use of physical and chemical enrichment and biological methods for improvement nutrition
CO4	Understand the economics of forage cultivation, grassland of India and their improvement
CO5	Understand the principles of grassland ecology, economic aspect of grassland, problems and their management

	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	know about the adaptation, distribution, agro techniques, anti-quality factors of improvement of fodder crops	2	2	3	3	3	3	3	3	3	2	2	2
CO2	know about the preservation and utilization of forage and pasture crops	3	2	1	2	2	2	3	2	2	3	2	2
CO3	Understand the use of physical and chemical enrichment and biological methods for improvement nutrition	2	2	3	3	3	3	2	3	3	3	2	3
CO4	Understand the economics of forage cultivation, grassland of India and their improvement	3	3	2	2	2	2	1	3	2	2	3	3
CO5	Understand the principles of grassland ecology, economic aspect of grassland, problems and their management	3	2	3	2	2	1	1	3	2	2	3	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

Agronomy of Major Field Crops (Rabi)

Paper code: APA 520

Course objective:

- To study about the origin, history, distribution, adaptation, classification, morphology, physiology of major field crops
- To study about the adaptation, classification, morphology, physiology of major field crops
- To study about the phenology, varietal improvement and production technology of major field crops
- To know about the quality components and industrial use of the main and by products
- To know about the post-harvest handling of main and by products for marketing

Course Outcome

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	learn study about the origin, history, distribution, adaptation, classification, morphology, physiology of major field crops
CO2	learn about the adaptation, classification, morphology, physiology of major field crops
CO3	Understand the phenology, varietal improvement and production technology of major field crops
CO4	Know the quality components and industrial use of the main and by products
CO5	Understand the post-harvest handling of main and by products for marketing

	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	learn study about the origin, history, distribution, adaptation, classification, morphology, physiology of major field crops	2	2	3	3	3	3	3	3	3	2	2	2
CO2	learn about the adaptation, classification, morphology, physiology of major field crops	3	2	1	2	2	2	3	2	2	3	2	2
CO3	Understand the phenology, varietal improvement and production technology of major field crops	2	2	3	3	3	3	2	3	3	3	2	3
CO4	Know the quality components and industrial use of the main and by products	3	3	2	2	2	2	1	3	2	2	3	3
CO5	Understand the post-harvest handling of main and by products for marketing	3	2	3	2	2	1	1	3	2	2	3	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

COURSE: Tillage in Crop Production
COURSE CODE: APA519

COURSE OBJECTIVES:

- Knowledge of agronomic practices affecting soil and its properties
- Basic knowledge of principles of different tillage practices, soil tilth, tillage requirement of crops under different type of soil
- Basic knowledge of minimum tillage, puddling, soil sickness
- Basic concepts of soil toxicity and soil compaction and their control measures
- Study of tillage in relation to weed control

COURSE OUTCOMES (CO):

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Basic knowledge of principles of different tillage practices, soil tilth, tillage requirement of crops under different type of soil
CO2	Students will have in-depth knowledge of agronomic practices affecting soil and its properties
CO3	Knowledge of minimum tillage, puddling, soil sickness
CO4	Basic concepts of soil toxicity and soil compaction and their control measures
CO5	Basic concepts of Tillage in relation to weed control

	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	Basic knowledge of principles of different tillage practices, soil tilth, tillage requirement of crops under different type of soil	3	2	3	2	3	2	2	3	2	1	3	1
CO2	Students will have in-depth knowledge of agronomic practices affecting soil and its properties	3	2	3	2	3	3	3	2	2	1	2	1
CO3	Knowledge of minimum tillage, puddling, soil sickness	3	3	2	2	3	3	2	2	2	1	2	1
CO4	Basic concepts of soil toxicity and soil compaction and their control measures	2	2	2	1	2	2	2	3	1	1	3	2
CO5	Basic concepts of Tillage in relation to weed control	3	3	3	2	2	1	1	3	2	1	2	2
3: Strong contribution, 2: average contribution, 1: Low contribution													

Name of Course/ Subject: 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** Modern plant 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 todowriting 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 –

Course Code: PGS505

Course Objectives:

- To know the objective and principle of extension education
- To 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.

Course 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		Agricultural/Horticultural implements	**PO6** Modern plant protection implements	**PO7** Extension Programme	**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													

Name of Course/ Subject: 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 to assure 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** 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 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								