

**Fourth Dean**  
**B.Sc (Hons.) Agriculture First Year/ First Semester (I/I)**

**Introductory Biochemistry**

**Course Code: AG 101**

**Course Objective**

1. To make the students aware about the basic concept of biochemistry, it's importance and role in agriculture.
2. To introduce the knowledge of plant cell and it's components; their structures and functions
3. To know the concept, structure, properties and applications of various biomolecules like carbohydrates, lipids, amino acids and nucleic acid
4. To make the students familiarize about the metabolism and the different cycles for generation of metabolic energy.
5. To learn and know about the biosynthesis of different biomolecules

**Course Outcome:**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Students are well equipped with the knowledge of basics of biochemistry, it's importance and role in agriculture.
<b>CO2</b>	Students will be able to explain the different components of the plant cell
<b>CO3</b>	Students are aware about the structure, functions and applications of various biomolecules..
<b>CO4</b>	Students know about the metabolism and the different metabolic cycles.
<b>CO5</b>	Learned the mechanism of biosynthesis of various biomolecules.

**CO-PO MAPPING:**

	CO	PO1 Basic Agriculture knowledge	PO2 Problem Solving	PO3 Field Experimentations	PO4 Implementation usage	PO5 Modern 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
C01	Students are well equipped with the knowledge of basics of biochemistry, it's importance and role in agriculture.	3	2	1	1		1		3		2		3
C02	Students will be able to explain the different components of the plant cell	3	2	1	1		1		1		2		3
C03	Students are aware about the structure, functions and applications of various biomolecules..	3	3	1	1		1		1		2		3
C04	Students know about the metabolism and the different metabolic cycles.	3	3	1	1		1		3		2		3
C05	Learned the mechanism of biosynthesis of various biomolecules like carbohydrates, lipids, proteins and nucleic acids	3	3	1	1		1		3		2		3
3: Strong contribution, 2: average contribution, 1: Low contribution													

**Introduction to Computer Application**

**COURSE CODE: CA111**

**COURSE OBJECTIVES:**

- Basics knowledge of computers: History, evolution, Memory & Input/Output/Storage Devices
- Awareness of Type of software, System software, Applications Software
- Introduction to Ms-Word and Ms-Excel, Basics and Concepts
- Knowledge of DOS and Windows Operating System
- Basic knowledge of Computer Viruses: Types of computer viruses, worms, Trojans, Security Aspects

**COURSE OUTCOMES (CO):**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Knowledge about History, evolution, Memory & Input/Output/Storage Devices
<b>CO2</b>	Introduction to Ms-Word and Ms-Excel, Basics and Concepts
<b>CO3</b>	Knowledge of DOS and Windows Operating System
<b>CO4</b>	Knowledge of Computer Viruses: Types of computer viruses, worms, Trojans, Security Aspects
<b>CO5</b>	Introduction to Ms-Word and Ms-Excel, Basics and Concepts

**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
<b>CO1</b>	Knowledge about History, evolution, Memory & Input/Output/Storage Devices	3	2	1	2	2	3	2	3	1	2	1	3
<b>CO2</b>	Introduction to Ms-Word and Ms-Excel, Basics and Concepts	3	2	2	2	1	3	2	3	1	2	1	3
<b>CO3</b>	Knowledge of DOS and Windows Operating System	3	2	3	2	2	3	1	3	2	2	1	2
<b>CO4</b>	Knowledge of Computer Viruses: Types of computer viruses, worms, Trojans, Security Aspects	3	1	3	1	1	3	1	3	1	2	1	3
<b>CO5</b>	Introduction to Ms-Word and Ms-Excel, Basics and Concepts	3	1	2	2	2	3	1	3	1	2	1	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

**Introductory Agriculture(Ancient Heritage, Agricultural Scenario And Gender Equity in Agriculture)**

**COURSE Code: AG 102**

**COURSE OBJECTIVES:**

- To study the agricultural history of India
- To gain knowledge of the different factors affecting crop production
- To gain knowledge about the various types of farming systems used in agriculture
- To understand the requirement of new technologies and research in agriculture
- To know the role of women in agriculture

**COURSE OUTCOMES (CO):**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Students will study the agricultural history of India
<b>CO2</b>	Students will gain knowledge of the different factors affecting crop production
<b>CO3</b>	Students will gain knowledge about the various types of farming systems used in agriculture
<b>CO4</b>	Students will understand the requirement of new technologies and research in agriculture
<b>CO5</b>	Students will understand the role and importance of women in 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	PO 11. Communication	PO 12. Life-long learning
C01	Students will study the agricultural history of India	3	2	1	2	2	3	2	3	1	2	1	3
C02	Students will gain knowledge of the different factors affecting crop production	3	2	2	2	2	3	1	3	1	2	1	3
C03	Students will gain knowledge about the various types of farming systems used in agriculture	3	2	3	2	2	3	1	3	1	3	1	2
C04	Students will understand the requirement of new technologies and research in agriculture	3	1	3	3	3	3	2	3	1	2	1	3
C05	Students will understand the role and importance of women in agriculture	3	2	2	2	2	1	1	3	1	3	1	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

**Human Values and Agricultural Ethics COURSE CODE: BM 121**

**Course objectives:**

- To study about the human value education along with its need, content and process
- To explore the continuous happiness, prosperity and physical facilities
- To understand the ethical values, farm ethics, animal ethics, food safety ethics, environmental ethics, research ethics
- To understand basis and scope of professionalism, global issues
- To study the life story of prophet Mohammad, Mahatama Gandhi, Swami Vivekanad, Marie Curie and Steve Jobs

**COURSE OUTCOMES (CO):**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Students will learn about the human value education along with its need, content and process
<b>CO2</b>	Students can explore the continuous happiness, prosperity and physical facilities
<b>CO3</b>	Students will understand the ethical values, farm ethics, animal ethics, food safety ethics, environmental ethics, research ethics
<b>CO4</b>	Students will learn the basis and scope of professionalism, global issues
<b>CO5</b>	Life story of great person will help students to understand the adverse conditions of life and how to cope them

**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
C01	Students will learn about the human value education along with its need, content and process	1	1	1	2	1	1	3	1	1	3	1	3
C02	Students can explore the continuous happiness, prosperity and physical facilities	1	1	2	1	1	1	3	1	3	2	2	3
C03	Students will understand the ethical values, farm ethics, animal ethics, food safety ethics, environmental ethics, research ethics	2	3	2	1	1	3	3	3	3	3	3	2
C04	Students will learn the basis and scope of professionalism, global issues	1	3	2	2	1	3	3	3	3	2	2	3
C05	Life story of great person will help students to understand the adverse conditions of life and how to cope them	1	1	1	1	1	1	3	1	1	3	1	3
3: Strong contribution, 2: average contribution, 1: Low contribution													



**Principles of Agronomy and Agricultural Meteorology COURSE CODE: AG103**

**COURSE OBJECTIVES:**

- Basics knowledge of Agronomy: National and International Agricultural Research Institutes in India
- Awareness of Tillage, crops stand establishment, Planting geometry and its effect on growth and yield cropping systems
- Knowledge of Earths' atmosphere. Composition and structure, solar radiation, Nature, properties, depletion, solar constant and energy balance
- Knowledge of Air Pressure variations; Wind: factors affecting, cyclones and anticyclones and general circulation
- Knowledge of Atmospheric humidity, vapour pressure and saturation, Process of condensation, formation of dew, fog, mist, snow, rain and hail
- Basics of Formation and classification of clouds, Introduction to monsoon, Basics of weather forecasting

**COURSE OUTCOMES (CO):**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Meaning and scope of Agronomy: National and International Agricultural Research Institutes in India
<b>CO2</b>	Knowledge of Earths' atmosphere. Composition and structure, solar radiation, Nature, properties, depletion, solar constant and energy balance
<b>CO3</b>	Basics of Tillage, crops stand establishment, Planting geometry and its effect on growth and yield cropping systems
<b>CO4</b>	Knowledge of Atmospheric humidity, vapour pressure and saturation, Process of condensation, formation of dew, fog, mist, snow, rain and hail
<b>CO5</b>	Knowledge of Process of condensation, formation of dew, fog, mist, snow, hail and rain

**CO-PO MAPPING:**

	<b>CO</b>	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
<b>CO1</b>	Meaning and scope of Agronomy: National and International Agricultural Research Institutes in India	3	2	2	2	2	2	1	3	1	2	3	3
<b>CO2</b>	Knowledge of Earths' atmosphere. Composition and structure, solar radiation, Nature, properties, depletion, solar constant and energy balance	3	2	2	2	1	3	1	3	1	2	1	3
<b>CO3</b>	Basics of Tillage, crops stand establishment, Planting geometry and its effect on growth and yield cropping systems	3	2	3	1	2	3	1	3	2	2	1	2
<b>CO4</b>	Knowledge of Atmospheric humidity, vapour pressure and saturation, Process of condensation, formation of dew, fog, mist, snow, rain and hail	3	2	3	2	1	3	1	3	1	1	1	3
<b>CO5</b>	Knowledge of Process of condensation, formation of dew, fog, mist, snow, hail and rain	3	2	2	1	2	3	1	3	1	1	1	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

**Introduction of Soil Science**

**Course code: AG104**

**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*

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

**CO-PO MAPPING:**

	<b>CO</b>	<b>PO1</b> Basic Agriculture knowledge	<b>PO2</b> Problem Solving	<b>PO3</b> Field Experimentations	<b>PO4</b> Pesticide usage	<b>PO5</b> Modern Agriculture/Horticultural implements	<b>PO6</b> Modern plant protection implements	<b>PO7</b> Extension Programme	<b>PO8</b> Environment and sustainability	<b>PO9</b> Ethics	<b>PO10</b> Individual and team work	<b>PO11</b> Communication	<b>PO12</b> Lifelong learning
<b>CO1</b>	To gain basic knowledge of soil fertility and productivity	3	1	2	1	1	3	3	3		3	1	3
<b>CO2</b>	To study Importance or Significance of soil macronutrient and micronutrients	3	3	3	1		3	3	3		3	3	2
<b>CO3</b>	To Assess and develop importance of soil physical and chemical properties	3	2	1	1		2	3	3	1	1	2	3
<b>CO4</b>	To study about soil pollution and mitigation process	3	2	2	2		3	3	3		2	3	3
<b>CO5</b>	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													

**Agricultural Microbiology**

**Course Code: AG 105**

**Course objective**

1. To know about agricultural microbial structure
2. Familiar with different types of helpful microbes in agriculture.
3. Knowledge of microbiology for human welfare.
4. Knowledge of different microbes, their genetics

**Course Outcome:**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Student is able to know regarding microbial world, bacterial and fungal cell structure
<b>CO2</b>	Learn about microbial genetics
<b>CO3</b>	Students are able to know about utility of different types of agricultural microbes
<b>CO4</b>	Regarding atmospheric nitrogen fixation and differentiation between Rhizosphere and phyllosphere.
<b>CO5</b>	By the end of course students will be able to understand the role of microbes for human welfare.

## 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
C01	Able to know what are the basic criteria for selection of different microbes	3	3	3	2	2	1	3	-			3
C02	Can use the basic knowledge regarding different microbial practices used in Agriculture	3	2	3	2	2		2	-			3
C03	Students are able to know about techniques involved in microbial isolation	3	3	2	3	2		2	-	1		3
C04	Study of genetic engineering	3	2	2	2		3	3				2
C05	By the end of course students will be able to learn regarding biofuel production	3	3	3	3	1	3	3	1			3
		1: Low contribution, 2: average contribution, 3: Strong contribution										

## **FUNDAMENTALS OF HORTICULTURE**

**COURSE CODE: HT-111**

### **COURSE OBJECTIVES:**

1. Students will get basic knowledge about horticulture course and its scope
2. Students can get hands on training practical knowledge
3. Demonstrate the safe use of equipment, chemicals and tools used in the industry.
4. Identify and explain benefits of professional organizations in the horticulture industry.
5. To understand basic problems comes under horticulture production technology
6. To know the importance of market and industrial value of different horticultural crops

### **COURSE OUTCOMES (CO):**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Demonstrate an understanding of the composition, fertility and biology of soil and how they relate to good plant growth
<b>CO2</b>	Identify and prescribe sustainable options in horticulture which benefit the environment while maintaining productivity and economic viability
<b>CO3</b>	Apply horticultural skills and knowledge to operate various business entities found in the horticultural industry.
<b>CO4</b>	Identify and practice safe use of tools, equipment and supplies used in horticulture careers.
<b>CO5</b>	Propagate, grow, and maintain plants in horticulture production systems.

	CO	PO1 Basic Agriculture knowledge	PO2 Problem Solving	PO3 Field Experimentations	PO4 Modern implements usages	PO5 Modern 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
C01	Demonstrate an understanding of the composition, fertility and biology of soil and how they relate to good plant growth	3	3	2	1	3	3		3	1	1	1	3
C02	Identify and prescribe sustainable options in horticulture which benefit the environment while maintaining productivity and economic viability	3	2	3	2	3	1		3	2	3	1	2
C03	Apply horticultural skills and knowledge to operate various business entities found in the horticultural industry.	3	2	3	1	3	2		3	3	2	1	3
C04	Identify and practice safe use of tools, equipment and supplies used in horticulture careers.	3	2	3	2	3	3		3	2	3	3	3
C05	Propagate, grow, and maintain plants in horticulture production systems.	3	1	1	1	3	2		3	3	3	2	3
3: Strong contribution, 2: average contribution, 1: Low contribution													



**Functional skills in English**

**COURSE CODE: LN102**

**COURSE OBJECTIVES:**

- Knowledge of Professional, cultural and cross-cultural communication
- Basics concept of structural and functional grammar; meaning and process of communication, verbal and nonverbal communication
- Knowledge of reading and comprehension of general and technical articles, precise writing, summarizing, abstracting
- Basic concepts of group discussion, organizing seminars and conferences
- Time management: Personal organization, prioritizing and balancing; Cosmopolitan culture

**COURSE OUTCOMES (CO):**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Knowledge of professional, cultural and cross-cultural communication
<b>CO2</b>	Basic knowledge of structural and functional grammar; meaning and process of communication, verbal and nonverbal communication
<b>CO3</b>	Reading and comprehension of general and technical articles, precise writing, summarizing, abstracting
<b>CO4</b>	Basic concepts of group discussion, organizing seminars and conferences
<b>CO5</b>	Personal organization, prioritizing and balancing; Cosmopolitan culture, Group discussions

**CO-PO MAPPING:**

	<b>CO</b>	PO 1. Basic Agriculture knowledge	PO 2. Problem Solving	PO 3. Field Experimentations	PO 4. Modern implementation usage	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
<b>C01</b>	Knowledge of professional, cultural and cross-cultural communication	1	2	1	1	1	1	2	3	3	1	3	3
<b>C02</b>	Basic knowledge of structural and functional grammar; meaning and process of communication, verbal and nonverbal communication	1	2	1	1	1	1	2	3	2	2	3	1
<b>C03</b>	Reading and comprehension of general and technical articles, precise writing, summarizing, abstracting	1	2	1	1	1	1	2	3	1	2	3	3
<b>C04</b>	Basic concepts of group discussion, organizing seminars and conferences	1	2	1	1	1	1	2	3	2	1	3	3
<b>C05</b>	Personal organization, prioritizing and balancing; Cosmopolitan culture, Group discussions	1	2	1	1	1	1	2	2	3	1		3
3: Strong contribution, 2: average contribution, 1: Low contribution													

## **B.Sc (Hons.) Agriculture First Year/ Second Semester (I/II)**

### ***Statistics in Agriculture***

**COURSE CODE: MT118**

#### **COURSE OBJECTIVES:**

- Basic concepts of statistics, Definition of Statistics and its use and limitations; Frequency Distribution and Frequency Curves
- Knowledge of Central Tendency: Characteristics of Ideal Average, Arithmetic Mean; Median, Mode
- Knowledge of Normal Distribution and its properties; Introduction to Sampling
- Basics of Experimental Designs: Basic Designs, Completely Randomized Design (CRD), Layout and analysis with equal and unequal number of observations, Randomized Block Design (RBD), Layout and analysis, Latin Square Design (LSD), Layout and analysis.
- Small Sample Test: for Means, Student's t-test for Single Sample, Two Samples and Paired t-test. F-test; Chi-Square Test in 2x2 Contingency Table

#### **COURSE OUTCOMES (CO):**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Students will have basic knowledge of Definition of Statistics and its use and limitations; Frequency Distribution and Frequency Curves
<b>CO2</b>	Knowledge of Central Tendency: Characteristics of Ideal Average, Arithmetic Mean; Median, Mode
<b>CO3</b>	Basics of Probability: Definition and concept of probability; Normal Distribution and its properties
<b>CO4</b>	Basics of Experimental Designs: Basic Designs, Completely Randomized Design (CRD), Layout and analysis with equal and unequal number of observations, Randomized Block Design (RBD), Layout and analysis, Latin Square Design (LSD), Layout and analysis
<b>CO5</b>	Small Sample Test: for Means, Student's t-test for Single Sample, Two Samples and Paired t-test. F-test; Chi-Square Test in 2x2 Contingency Table

**CO-PO MAPPING:**

	CO	Agriculture knowledge	PO 2. Problem Solving	PO 3. Field Experimentations	implementation usage	Horticultural implements	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
<b>CO1</b>	Students will have basic knowledge of Definition of Statistics and its use and limitations; Frequency Distribution and Frequency Curves	3	3	2	1	1	1	1	1	2	1	1	2
<b>CO2</b>	Knowledge of Central Tendency: Characteristics of Ideal Average, Arithmetic Mean; Median, Mode	3	3	2	1	1	1	1	1	3	1	1	2
<b>CO3</b>	Basics of Probability: Definition and concept of probability; Normal Distribution and its properties	3	3	2	1	1	1	1	1	2	1	1	2
<b>CO4</b>	Basics of Experimental Designs: Basic Designs, Completely Randomized Design (CRD), Layout and analysis with equal and unequal number of observations, Randomized Block Design (RBD), Layout and analysis, Latin Square Design (LSD), Layout and analysis	3	3	3	1	1	1	1	1	2	1	1	22
<b>CO5</b>	Small Sample Test: for Means, Student's t-test for Single Sample, Two Samples and Paired t-test. F-test; Chi-Square Test in 2x2 Contingency Table	3	3	3	1	1	1	1	1	2	1	1	2
3: Strong contribution, 2: average contribution, 1: Low contribution													

**Introductory Nematology**

**COURSE CODE: AG106**

**COURSE OBJECTIVES:**

- Basics knowledge of nematodes, History of phytonematology. Economic importance
- Awareness of Nematode general morphology and biology
- General characteristics of plant pathogenic nematodes, Classification of nematodes upto family level
- Knowledge of Classification of nematodes by habitat. Identification of economically important plant nematodes upto generic level
- Basic knowledge of symptoms caused by nematodes with examples, Interaction between plant parasitic nematodes and disease causing fungi, bacteria and viruses.
- Basic knowledge of methods of nematode management. Cultural methods (crop rotation, fallowing, soil amendments, other land management techniques)

**COURSE OUTCOMES (CO):**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Awareness of Nematode general morphology and biology
<b>CO2</b>	Basics knowledge of nematodes, History of phytonematology. Economic importance
<b>CO3</b>	General characteristics of plant pathogenic nematodes, Classification of nematodes upto family level
<b>CO4</b>	Basic knowledge of symptoms caused by nematodes with examples, Interaction between plant parasitic nematodes and disease causing fungi, bacteria and viruses
<b>CO5</b>	Knowledge of Classification of nematodes by habitat. Identification of economically important plant nematodes upto generic level

**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
C01	Awareness of Nematode general morphology and biology	2	1	2	2	1	3	2	1	1	2	1	2
C02	Basics knowledge of nematodes, History of phytonematology. Economic importance	2	1	2	2	1	3	2	2	1	2	1	2
C03	General characteristics of plant pathogenic nematodes, Classification of nematodes upto family level	2	1	2	2	1	3	1	2	2	2	1	3
C04	Basic knowledge of symptoms caused by nematodes with examples, Interaction between plant parasitic nematodes and disease causing fungi, bacteria and viruses	2	1	2	1	1	3	1	2	1	2	1	3
C05	Knowledge of Classification of nematodes by habitat. Identification of economically important plant nematodes upto generic level	2	1	2	2	1	3	1	2	1	2	1	2
3: Strong contribution, 2: average contribution, 1: Low contribution													

**Principles of agricultural economic**

**Course Code: BM123**

**Course Objective**

1. To introduction fundamentals of economics and Meaning, Definition, Nature and Scope of Production Economics.
2. To make students aware of Farm and Production Economics
3. To be familiar about Micro and Macro concept of economics.
4. To study about economic structure of India

**Course Outcome:**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Students are aware of fundamentals of economics and Meaning, Definition, Nature and Scope of Production Economics.
<b>CO2</b>	Students are aware of Farm and Production Economics
<b>CO3</b>	Students know about Micro and Macro concept of economics.
<b>CO4</b>	Students are aware of economic structure of India

**CO-PO MAPPING:**

	CO	PO1 Basic Agriculture knowledge	PO2 Problem Solving	PO3 Field Experimentations	usage	PO5 Modern 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
C01	Students are aware of fundamentals of economics and Meaning, Definition, Nature and Scope of Production Economics.	3	2					2	3	3	3	3	3
C02	Students are aware of Farm and Production Economics	3	3					1	3	3	3	3	2
C03	Students know about Micro and Macro concept of economics.	3	2					2	3	2	1	3	3
C04	Students are aware of economic structure of India	3	3					2	3	2	2	2	3
3: Strong contribution, 2: average contribution, 1: Low contribution													



**Comprehension and Communication Skills in English**

**COURSE CODE: LN103**

**COURSE OBJECTIVES:**

- Knowledge of Comprehension: Text for comprehension, Current English for Colleges
- Basics concept of - Synonyms - Antonyms - Often confused words
- Knowledge of reading and comprehension of general and technical articles, precise writing, summarizing, abstracting
- Basic concepts of group discussion, organizing seminars and conferences
- Spoken English and Broken English G.B. Shaw (a) Reading Comprehension (b) language study, Functional Grammar, Agreement of verb with subject

**COURSE OUTCOMES (CO):**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Knowledge of Text for comprehension, Current English for Colleges
<b>CO2</b>	Basic knowledge of structural and functional grammar; meaning and process of communication, verbal and nonverbal communication
<b>CO3</b>	Reading and comprehension of general and technical articles, Synonyms - Antonyms - Often confused words
<b>CO4</b>	Basic concepts of Exercises on Figurative language & Idiomatic language
<b>CO5</b>	Group discussions, Spoken English and Broken English

**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
C01	Knowledge of Text for comprehension, Current English for Colleges	1	2	1	1	1	1	2	3	3	1	3	3
C02	Basic knowledge of structural and functional grammar; meaning and process of communication, verbal and nonverbal communication	1	2	1	1	1	1	2	3	2	2	3	1
C03	Reading and comprehension of general and technical articles, Synonyms - Antonyms - Often confused words	1	2	1	1	1	1	2	3	1	2	3	3
C04	Basic concepts of Exercises on Figurative language & Idiomatic language	1	2	1	1	1	1	2	3	2	1	3	3
C05	Group discussions, Spoken English and Broken English	1	2	1	1	1	1	2	2	3	1		3
3: Strong contribution, 2: average contribution, 1: Low contribution													

## Water Management Including MicroIrrigation

Course Code: AG107

### Course objectives:

1. Knowledge about importance and scope of water management including irrigation
2. In depth knowledge of irrigation practices, methods of irrigation and soil application of fertilizers
3. Familiar with different irrigation methods, and need of water management in different crops
4. Knowledge of scheduling of irrigation, surface, sprinkler and drip irrigation
5. Knowledge of Water management of different field and fruit crops

### **Course Outcome**

After completion of course, a student will be able to

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Able to understand about of water management including irrigation
<b>CO2</b>	Learn the basic knowledge of methods of irrigation and soil application of fertilizers
<b>CO3</b>	Able to know about methods of soil moisture estimation, evapo-transpiration and crop water requirement
<b>CO4</b>	Study of irrigation and nutrient management and their applications in production vegetables
<b>CO5</b>	Basic concepts of Water management of different crops (rice, wheat, maize, groundnut, sugarcane, mango, banana and tomato); Agricultural drainage

**CO-PO MAPPING:**

	CO	PO1 Basic Agriculture knowledge	PO2 Problem Solving	PO3 Field Experimentations	PO4 Modern Agricultural implements usage	PO5 Modern 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
<b>CO1</b>	Able to understand about of water management including irrigation	2	3	2	1	2	2	2	3	2	1	1	3
<b>CO2</b>	Learn the basic knowledge of methods of irrigation and soil application of fertilizers	2	3	3	1	2	2	1	3	2	1	1	3
<b>CO3</b>	Able to know about methods of soil moisture estimation, evapo-transpiration and crop water requirement	2	3	2	1	2	3	2	3	1	1	1	3
<b>CO4</b>	Study of irrigation and nutrient management and their applications in production vegetables	2	3	3	1	2	2	2	3	1	1	1	3
<b>CO5</b>	Basic concepts of Water management of different crops (rice, wheat, maize, groundnut, sugarcane, mango, banana and tomato); Agricultural drainage	2	3	2	1	2	2		3	1	1	1	3
3: Strong contribution, 2: average contribution, 1: Low contribution													

**Field Crops-II (Rabi)**

**COURSE CODE: AG108**

**COURSE OBJECTIVES:**

- Basics knowledge of Origin, geographical distribution, economic importance of field crops
- Green manures, Oil cakes, Sewage and sludge – Biogas plant slurry, Plant and animal refuges
- Knowledge of soil and climatic requirements, varieties, cultural practices and yield of rabi crops
- Basic knowledge of Cereals; wheat, barley; Pulses; chickpea, lentil peas, French beans
- Knowledge of sowing practices of Oilseeds: rapeseed and mustard, sunflower, safflower and linseed; Sugar crops: sugar cane and sugar beet

**COURSE OUTCOMES (CO):**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Basics knowledge of Origin, geographical distribution, economic importance of field crops
<b>CO2</b>	Knowledge of soil and climatic requirements, varieties, cultural practices and yield of rabi crops
<b>CO3</b>	Knowledge of sowing practices of Oilseeds: rapeseed and mustard, sunflower, safflower and linseed; Sugar crops: sugar cane and sugar beet
<b>CO4</b>	Knowledge of sowing practices of Cereals; wheat, barley; Pulses; chickpea, lentil peas, French beans
<b>CO5</b>	Knowledge of sowing practices of Medicinal and aromatic crops such mentha, lemon grass; citronella, palma rosa and postha; commercial crops; potato and tobacco, forage crops; barseem, Lucerne and oat

**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
C01	Basics knowledge of Origin, geographical distribution, economic importance of field crops	3	3	2	3	2	2	2	1	3	3	1	1
C02	Knowledge of soil and climatic requirements, varieties, cultural practices and yield of rabi crops	3	2	2	3	2	2	2	2	3	2	1	2
C03	Knowledge of sowing practices of Oilseeds: rapeseed and mustard, sunflower, safflower and linseed; Sugar crops: sugar cane and sugar beet	2	2	2	3	2	2	2	2	2	2	1	2
C04	Knowledge of sowing practices of Cereals; wheat, barley; Pulses; chickpea, lentil peas, French beans	2	2	2	3	2	2	2	2	2	2	1	2
C05	Knowledge of sowing practices of Medicinal and aromatic crops such mentha, lemon grass; citronella, palma rosa and postha; commercial crops; potato and tobacco, forage crops; barseem, Lucerne and oat	2	2	2	3	2	2	2	2	2	2	1	2
3: Strong contribution, 2: average contribution, 1: Low contribution													

## **Plant Pathogens and Principles of Plant Pathology**

**Course Code: AG 109**

### **Course Objective**

1. To introduce the important group of plant pathogenic organism and diseases caused by them.
2. To make the students learn about the classification and general characters of prokaryotes.
3. To know the concept, objectives, history and role of plant pathology in agriculture.
4. To know the concept of defense mechanism in plants and plant disease forecasting.
5. To learn the cultural, mechanical, chemical and biological methods of pest control.

### **Course Outcome:**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Students are well equipped with the knowledge important group of plant pathogenic organism and diseases caused by them
<b>CO2</b>	Students will be able to explain the classification and general characters of prokaryotes.
<b>CO3</b>	Students are aware about concept, objectives, history and role of plant pathology in agriculture.
<b>CO4</b>	Students know the concept of defense mechanism in plants and plant disease forecasting.
<b>CO5</b>	Learned the cultural, mechanical, chemical and biological methods of pest control.

**CO-PO MAPPING:**

	CO	PO1 Basic Agriculture knowledge	PO2 Problem Solving	PO3 Field Experimentations	PO4 modern implementation usage	PO5 Modern 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 are well equipped with the knowledge important group of plant pathogenic organism and diseases caused by them	3	2	1	1		3		2		3		3
CO2	Students will be able to explain the classification and general characters of prokaryotes.	3	2	1	1		3		2		2		3
CO3	Students are aware about concept, objectives, history and role of plant pathology in agriculture.	3	2	1	1		3		2		2		3
CO4	Students know the concept of defense mechanism in plants and plant disease forecasting.	3	3	3	1		3		3		3		3
CO5	Learned the cultural, mechanical, chemical and biological methods of pest control.	3	3	3	3		3		3		3		3
3: Strong contribution, 2: average contribution, 1: Low contribution													



**Principle of Genetics**

**Course Code: AG 110**

**Course Objective**

1. To introduce the basic concept of Genetics.
2. To introduce the concept of genetic inheritance.
3. To introduce basic knowledge of different type of molecular markers
4. To know about gene interaction

**Course Outcome:**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	gives information regarding laws of inheritance, basic knowledge regarding DNA RNA and other biomolecules
<b>CO2</b>	able to know about various biomolecules needed for life, their mode of action and their role
<b>CO3</b>	Students can figure out the measures to produce different GM crops by different means
<b>CO4</b>	Students can use the basic knowledge regarding DNA and its action.
<b>CO5</b>	Select and evaluate information related gene action.

**CO-PO MAPPING:**

	CO	PO1 Basic Agriculture knowledge	PO2 Problem Solving	PO3 Field Experimentations	usage	PO5 Modern 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
C01	gives information regarding laws of inheritance, basic knowledge regarding DNA RNA and other biomolecules	3	3	1	1		1		3				3
C02	able to know about various biomolecules needed for life, their mode of action and their role	3	3	3	2		3		3				2
C03	Students can figure out the measures to produce different GM crops by different means	3	2	3	3		3		3				3
C04	Students can use the basic knowledge regarding DNA and its action.	3	2	2	2		3		3				3
C05	Select and evaluate information related gene action.	3	3	3	3		2		3				3
3: Strong contribution, 2: average contribution, 1: Low contribution													

**Soil Chemistry, Soil Fertility and Nutrient Management**

**Course code: AG-111**

**Course outcomes**

1. Students of undergraduate will gain knowledge on chemical composition and nutritional quality of various field and horticultural crops.
2. Proper understanding of chemistry of pesticides will be inculcated among the students.
3. The knowledge gained in this course will be useful in understanding the behavior of soils in crop production and management
4. Understand the methods and types of soil survey and soil maps
5. Understand the role of soil forming factors and processes in soil formation

**Outcome:**

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

<b>COURSE OUTCOME (CO)</b>	<b>DESCRIPTION</b>
<b>CO1</b>	Understand various soil physical, chemical and biological properties and their impact on plant growth.
<b>CO2</b>	Understand various Nutrient management concepts and Nutrient use efficiencies of major and micronutrients and enhancement techniques.
<b>CO3</b>	Comprehensive knowledge on rocks and minerals, their composition and the types of soils formed from different parent materials
<b>CO4</b>	Imparts knowledge on different pesticides, their nature and, mode of action and their fate in soil so as to monitor their effect on the environment.
<b>CO5</b>	Reclamation and management of soil physical and chemical constraints.

**CO-PO MAPPING:**

	<b>CO</b>	<b>PO1</b> Basic Agriculture knowledge	<b>PO2</b> Problem Solving	<b>PO3</b> Field Experimentations	<b>PO4</b> Modern implementation usage	<b>PO5</b> Modern Agricultural/Horticultural implements	<b>PO6</b> Modern plant protection implements	<b>PO7</b> Extension Programme	<b>PO8</b> Environment and sustainability	<b>PO9</b> Ethics	<b>PO10</b> Individual and team work	<b>PO11</b> Communication	<b>PO12</b> Lifelong learning
<b>CO1</b>	Understand various soil physical, chemical and biological properties and their impact on plant growth.	3	3	2	1	1	3	3	3	2	3		3
<b>CO2</b>	Understand various Nutrient management concepts and Nutrient use efficiencies of major and micronutrients and enhancement techniques.	3	3	3	1	1	3	3	3	2	3	1	2
<b>CO3</b>	Comprehensive knowledge on rocks and minerals, their composition and the types of soils formed from different parent materials	3	2	1	1	2	2	3	3	1	1	1	3
<b>CO4</b>	Imparts knowledge on different pesticides, their nature and, mode of action and their fate in soil so as to monitor their effect on the environment.	3	2	2	2	2	3	3	3	2	2	1	3
<b>CO5</b>	Reclamation and management of soil physical and chemical constraints.	3	1	1	1	2	2	3	3	2	2		3
3: Strong contribution, 2: average contribution, 1: Low contribution													

