B. Tech. II year II Sem.
COURSE: SOIL MECHANICS
COURSE CODE: AE251

COURSE OBJECTIVES:

- Basic of soil mechanics – index properties and engineering properties.
- Basic of slope's stability.

COURSE OUTCOMES (CO):

After the successful course completion, learners will develop following attributes:

COURSE OUTCOME (CO)	DESCRIPTION
CO1	To share the elementary knowledge of soil mechanics.
CO2	To share the index and engineering properties of soil.
CO3	To share the basics the slope's stability and requirement.

CO-PO MAPPING:

	CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	To share the elementary knowledge of soil mechanics.	3	1	1	0	0	0	0	0	0	0	0	0
CO2	To share the index and engineering properties of soil.	2	2	2	0	0	0	0	0	0	0	0	0
CO3	To share the basics the slope's stability and requirement.	1	3	3	0	0	0	0	0	0	0	0	0
3: Strong contribution, 2: average contribution, 1: Low contribution													

COURSE: Design of Structures
COURSE CODE: AE252

COURSE OBJECTIVES:

- To study the different types of load exerted on the structure and to design the connections.
- To design the structural steel members in tension, compression and bending.
- To design the steel roof trusses and to design the singly and doubly reinforced section.
- To design the flanged beam, slabs and columns.
- To design the foundation, retaining walls and silos.

COURSE OUTCOMES (CO):

After the successful course completion, learners will develop following attributes:

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Learner will learn how different types of load act on the structure and will able to design the connections.
CO2	Learner will be able to design the structural steel members in tension, compression and bending.
CO3	Learner will be able to design the singly reinforced sections, doubly reinforced sections and steel roof trusses.
CO4	Learner will learn how to design the flanged beam, slabs and columns.
CO5	Learner will learn how to design the foundation, retaining walls and silos.

CO-PO MAPPING:

	CO	PO1 Knowledge of Applied Science in Agricultural Engineering	PO2 Knowledge of Basic Engineering	PO3 Problem Solving	PO4 Field Experimentations	PO5 Knowledge of Soil and Water Conservation Engineering	PO6 Knowledge of Irrigation and Drainage Engineering	PO7 Knowledge of Farm Machinery, equipments and techniques	PO8 Knowledge of Process and Food Engineering equipments and techniques	PO9 Knowledge of Renewable Energy Engineering	PO10 Environment and sustainability	PO11 Ethics	PO12 Individual and team work	PO13 Communication and skill development	PO14 Lifelong learning
CO1	Learner will learn how different types of load act on the structure and will able to design the connections.	1	3	2	1	1	1	1			1				2
CO2	Learner will be able to design the structural steel members in tension, compression and bending.	2	3	2	1	-	-	1			1				2
CO3	Learner will be able to design the singly reinforced sections, doubly reinforced sections and steel roof trusses.	2	3	2	-	-	-	2	1		1				2
CO4	Learner will learn how to design the flanged beam, slabs and columns.	1	3	3	-	-	-	2			1				2
CO5	Learner will learn how to design the foundation, retaining walls and silos.	1	3	2	1	1	-	1			1				2
	3: Strong contribution, 2: average contribution, 1: Low contribution														

Name of Course/subject: Farm Machinery and Equipment-I

Course Code: AE253

Course Objective:

1. To expose the students to farm mechanization benefits and constraints, farm machinery selection and cost analysis.
2. To introduce the students to the working principles of farm equipment, tillage, sowing, planting machinery.
3. To identify the components of primary, secondary tillage implements, land reclamation and earth moving equipment.
4. To impart the knowledge of numerical analysis based on power, draft, capacity of farm machinery.
5. To provide knowledge about material of construction for farm machinery.

Course Outcome:

At the completion of the course the student will:

COURSE OUTCOME (CO)	DESCRIPTION
CO1	have knowledge about the present status of farm mechanization, selection of farm machinery and cost analysis.
CO2	be able to know the working principles of farm equipment, tillage, sowing, planting machinery.
CO3	have the basic knowledge of primary, secondary tillage implements, land reclamation and earth moving equipment.
CO4	have the knowledge to solve numerical analysis based on power, draft, capacity of farm machinery.
CO5	be able to select the material of construction for farm machinery.

CO-PO MAPPING:

	CO	**PO1.** Knowledge of Applied Science in Agricultural Engineering.	**PO2.** Knowledge of Basic Engineering.	**PO3.** Problem Solving.	**PO4.** Field Experimentations.	**PO5.** Knowledge of Soil and Water Conservation Engineering.	**PO6.** Knowledge of Irrigation and Drainage Engineering.	**PO7.** Knowledge of Farm Machinery, equipment and techniques.	**PO8.** Knowledge of Process and Food Engineering equipment and techniques.	**PO9.** Knowledge of Renewable Energy Engineering.	**PO10.** Environment and sustainability.	**PO11.** Ethics.	**PO12.** Individual and team work	**PO13.** Communication and skill development.	**PO14.** Lifelong learning.
CO1	have knowledge about the present status of farm mechanization, selection of farm machinery and cost analysis.	2	1	2	2	-	-	3					2		2
CO2	be able to know the working principles of farm equipment, tillage, sowing, planting machinery.	3	3	2	3	-	-	3					3		3
CO3	have the basic knowledge of primary, secondary tillage implements, land reclamation and earth moving equipment.	3	3	2	3	-	-	3					3		3
CO4	have the knowledge to solve numerical analysis based on power, draft, capacity of farm machinery.	3	3	3	3	-	-	3					2		3
CO5	be able to select the material of construction for farm machinery.	3	3		1	-	-	3					1		2
3: Strong contribution, 2: average contribution, 1: Low contribution															

Name of Course/ Subject: Principles of Horticultural Crops and Plant Protection

Course Code: AG231

Course objective:

1. To provide information to the students on the basic principles of Horticulture and Plant protection.
2. To impart knowledge to the student about soil and climate requirement of different horticultural crops.
3. Knowledge regarding importance of cultural practices and propagation of horticultural crops
4. Knowledge about tools and implements used for garden crops.

Course Outcome

After completion of course, a student will be able to

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Gives information regarding Cultivation of Fruits, vegetables and flowers
CO2	Able to know about different criteria for site selection
CO3	Students are able to know water and fertilizer application
CO4	Students can use the basic knowledge on packaging of horticultural produce
CO5	Students can use the basic knowledge on management of horticultural disease and pest.

CO-PO MAPPING:

	CO	PO1 Knowledge of Applied Science in Agricultural Engineering	PO2 Knowledge of Basic Engineering	PO3 Problem Solving	PO4 Field Experimentations	PO5 Knowledge of Soil and Water Conservation Engineering	PO6 Knowledge of Irrigation and Drainage Engineering	PO7 Knowledge of Farm Machinery, equipments and techniques	PO8 Knowledge of Process and Food Engineering equipments and techniques	PO9 Knowledge of Renewable Energy Engineering	PO10 Environment and sustainability	PO11 Ethics	PO12 Individual and team work	PO13 Communication and skill development	PO14 Lifelong learning
CO1	Gives information regarding Cultivation of Fruits, vegetables and flowers			2	2			1	2		2			1	3
CO2	Able to know about different criteria for site selection			3	2	-	-							1	3
CO3	Students are able to know water and fertilizer application			2	2	-	-								2
CO4	Students can use the basic knowledge on packaging of horticultural produce			1		-	-		2		2				3
CO5	Students can use the basic knowledge on management of horticultural disease and pest			3	2	-	-				2				2
		3: Strong contribution, 2: average contribution, 1: Low contribution													

COURSE: Electrical Machines and Power Utilization
COURSE CODE: EE231

COURSE OBJECTIVES:

- Knowledge of laws of magnetic circuit and transformers
- To get knowledge of phase or diagram of transformer and DC generators
- To attain knowledge of working of DC motors
- To attain knowledge of poly-phase induction motor
- To have the knowledge of working and application of single phase induction motor

COURSE OUTCOMES (CO):

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Knowledge of magnetic circuit
CO2	Analyze the performance of transformers
CO3	Evaluate the performance of DC motors and apply in field of agriculture engineering
CO4	Knowledge of poly-phase induction motors
CO5	Knowledge of working and application of single phase induction motorand apply in field of agriculture engineering

CO-PO MAPPING:

	CO	**PO1** Knowledge of Applied Science in Agricultural	**PO2** Knowledge of Basic Engineering	**PO3** Problem Solving:	**PO4** Field Experimentations	**PO5** Knowledge of Soil and Water Conservation	**PO6** Knowledge of Irrigation and Drainage Engineering	**PO7** Knowledge of Farm Machinery, equipments and	**PO8** Knowledge of Process and Food Engineeringequipments	**PO9**Knowledge of Renewable Energy Engineering	**PO10** Environment and sustainability	**PO11** Ethics	**PO12** Individual and team work	**PO13** Communication and skill development	**PO14** Life-long learning
CO1	Knowledge of magnetic circuit	**1**	**2**	**2**	**1**						**1**		**1**	**2**	**2**
CO2	Analyze the performance of transformers	**1**	**3**	**3**	**1**		**1**	**1**	**1**		**1**		**1**	**2**	**2**
CO3	Evaluate the performance of DC motors and apply in field of agriculture engineering	**1**	**3**	**2**	**2**		**1**	**1**	**1**		**1**		**1**	**2**	**2**
CO4	Knowledge of polyphase induction motors	**1**	**3**	**2**	**2**		**1**	**1**	**1**		**1**		**1**	**2**	**2**

CO5	Knowledge of working and application of single phase induction motor and apply in field of agriculture engineering	**1**	**3**	**2**	**2**		**1**	**1**	**1**		**1**		**2**	**2**	**2**
3: Strong contribution, 2: average contribution, 1: Low contribution															

COURSE: MACHINE DESIGN
COURSE CODE: ME228

COURSE OBJECTIVES:

- Demonstrate understanding of various design considerations
- Illustrate basic principles of machine design
- Design machine elements for static as well as dynamic loading.
- Design machine elements on the basis of strength/ rigidity concepts.

COURSE OUTCOMES (CO):

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students become able to understand the Meaning of design, Phases of design, design considerations. Common engineering materials and their mechanical properties.
CO2	Students will demonstrate the ability to apply the fundamentals of stress analysis, theories of failure and material science in the design of machine components.
CO3	Demonstrate the design process of shaft, keys, couplings and bolted joints under various load conditions.
CO4	Demonstrate the design process of springs, belt drives, gears and screw jack.

CO-PO MAPPING:

	CO	**PO1** Knowledge of Applied Science in Agricultural Engineering	**PO2** Knowledge of Basic Engineering	**PO3** Problem Solving	**PO4** Field Experimentations	**PO5** Knowledge of Soil and Water Conservation Engineering	**PO6** Knowledge of Irrigation and Drainage Engineering	**PO7** Knowledge of Farm Machinery, equipment and techniques	**PO8** Knowledge of Process and Food Engineering equipment and techniques	**PO9** Knowledge of Renewable Energy Engineering	**PO10** Environment and sustainability	**PO11** Ethics	**PO12** Individual and team work	**PO13** Communication and skill development	**PO14** Lifelong learning
CO1	Students become able to understand the Meaning of design, Phases of design, design considerations. Common engineering materials and their mechanical properties.	2	3	2	1	-	-	2			-	-	-	-	2
CO2	Students will demonstrate the ability to apply the fundamentals of stress analysis, theories of failure and material science in the design of machine components.	2	3	2	1	-	-	2			-				2
CO3	Students able to Demonstrate the design process of shaft, keys, couplings and bolted joints under various load conditions.	2	3	2	1	-	-	2			-				2
CO4	Students able to Demonstrate the design process of springs, belt drives, gears and screw jack.	2	3	2	1	-	-	2			-				2
	3: Strong contribution, 2: average contribution, 1: Low contribution														

COURSE: THERMODYNAMICS, REFRIGERATION AND AIR CONDITIONING
COURSE CODE: ME229

COURSE OBJECTIVES:

1. Be able to have the basic concepts of thermal sciences and application of first law of thermodynamics for closed system.
2. To understand and apply first and second law of thermodynamics to various processes.
3. To understand basic principle and analysis of different types of refrigeration systems.
4. To have knowledge about common refrigerants and basic of psychrometry.
5. To have basic knowledge about air conditioning principles.

COURSE OUTCOMES (CO):

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Demonstrate basic concepts of thermal sciences and application of first law of thermodynamics for closed system.
CO2	Understand and apply first and second law of thermodynamics to various processes.
CO3	Understand basic principle and analysis of different types of refrigeration systems.
CO4	Demonstrate about common refrigerants and basic of psychrometry.
CO5	Demonstrate basic knowledge about air conditioning principles.

CO-PO MAPPING: (ME229)

	CO	**PO1** Knowledge of Applied Science in Agricultural Engineering	**PO2** Knowledge of Basic Engineering	**PO3** Problem Solving	**PO4** Field Experimentations	**PO5** Knowledge of Soil and Water Conservation Engineering	**PO6** Knowledge of Irrigation and Drainage Engineering	**PO7** Knowledge of Farm Machinery, equipments and techniques	**PO8** Knowledge of Process and Food Engineering equipments and techniques	**PO9**Knowledge of Renewable Energy Engineering	**PO10**Environment and sustainability	**PO11** Ethics	**PO12** Individual and team work	**PO13**Communication and skill development	**PO14**Lifelong learning
CO1	Demonstrate basic concepts of thermal sciences and application of first law of thermodynamics for closed system.	3	3	2	-	-	-								3
CO2	Understand and apply first and second law of thermodynamics to various processes.	3	3	2		-	-								3
CO3	Understand basic principle and analysis of different types of refrigeration systems.	3	3	2	2	-	-		2						3
CO4	Demonstrate about common refrigerants and basic of psychrometry. -	3	3	2		-			2						3
CO5	Demonstrate basic knowledge about air conditioning principles.	3	3	2	1	-									3
	3: Strong contribution, 2: average contribution, 1: Low contribution														

COURSE: PRINICIPLES OF AGRONOMY
COURSE CODE: AG232

COURSE OBJECTIVES:

1. To introduce the basic knowledge of introduction of Agronomy and it's scope.
2. To study about seed and sowing, crop nutrition and tillage .
3. To familiarize the students with the agencies involved in the seed production and management in India
4. To aware the students about the concept of weed management and quality of irrigation water..
5. To study about the crop rotation and its benefit.
6. To learn about organic farming and sustainable agriculture.

COURSE OUTCOMES (CO):

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

COURSE OUTCOME (CO)	DESCRIPTION
CO1	Students will be able to explain the agronomy, its scope and crop nutrion.
CO2	Students are understand well with the economic value of agriculture product, use of manures and fertilizers in agricultural crop and its impact on crop yield.
CO3	Students are aware about concept of weed management and crop weed competition .
CO4	Students know the concept of crop rotation, its principles and its benifits.
CO5	Learned the organic farming and sustainable agriculture.

	CO	**PO1.**Knowledge of Applied Science in Agricultural Engineering.	**PO2.**Knowledge of Basic Engineering.	**PO3.**Problem Solving.	**PO4.**Field Experimentations.	**PO5.**Knowledge of Soil and Water Conservation Engineering.	**PO6.**Knowledgeof Irrigation and Drainage Engineering.	**PO7.**Knowledge of Farm Machinery, equipment and techniques.	**PO8.**Knowledge of Process and Food Engineering equipment and techniques.	**PO9.**Knowledge of Renewable Energy Engineering.	**PO10.**Environment and sustainability.	**PO11.**Ethics.	**PO12.** Individual and team work	**PO13.** Communication and skill development.	**PO14.**Lifelong learning.
CO1	Students will be able to explain the agronomy, its scope and crop nutrion.	3	3	3	2	-	-	3					2		2
CO2	Students are understand well with the economic value of agriculture product, use of manures and fertilizers in agricultural crop and its impact on crop yield.	3	3	2	3	-	-	3					3		2
CO3	Students are aware about concept of weed management and crop weed competition .	3	2	2	3	-	-	3					3		2
CO4	Students know the concept of crop rotation, its principles and its benifits.	2	2	3	3	-	-	3					2		3
CO5	Learned the organic farming and sustainable agriculture.	2	3	2	2	-	-	3					1		2
3: Strong contribution, 2: average contribution, 1: Low contribution															

CO & PO Mapping: