DEPARTMENT OF MECHANICAL ENGINEERING

Program outcomes Detail

Sr. No.	Academic contents	Types of contents	Outcomes
1.	Program outcome	B. Tech	1. An ability to apply knowledge of mathematics, science and engineering principles for providing engineering solutions pertaining to agriculture 2. An ability to identify, formulate analyze and solve problems related to agriculture 3. An ability to design a system, components or process to increase agricultural production to meet the growing population 4. An ability to conduct experiments, analyze and interpret experimental results to provide valid conclusion. 5. An ability to conduct experiments, analyze and interpret experimental results to provide valid conclusion. 6. An ability to perform in multidisciplinary areas with social consciousness. 7. An ability to display social responsibility in sustaining natural environment. 8. An ability to apply professional and ethical principles with responsibility. 9. An ability to function effectively as an individual, as a part of team and in a multi-disciplinary environment. 10. An ability to communicate effectively. 11. An ability to devise a strategy or action plan to utilize the acquired knowledge in increasing water-use efficiency, farm mechanization and post harvest technology 12. An ability to engage in independent and lifelong learning in agricultural production processes

Sr. No.	Academic contents	Types of contents	Outcomes
2.	**Program Specific outcomes**	**B. Tech. (Agriculture)**	**Each student will attain at least the following specific outcomes from this B. tech degree course:** **PSO1: To design, develop agricultural implements for effective and efficient agricultural production.** **PSO2: To engage in lifelong learning, commitment to quality and continuous improvement in agricultural production system.** **PSO3: Ability to work in multidisciplinary teams.** **PSO4: Effectively use the technology in post-harvest operations.** **PSO 1: utilize adequate knowledge in different disciplines of Agriculture engineering to gain better employment in various industries of Agriculture engineering.** **PSO 2: use their expertise in planning judicious utilization of natural recourses and their management through advanced soil and water conservation techniques and various irrigation and drainage methods with the skill of data interpretation.** **PSO 3: develop skills necessary to design the process and evaluate and come out with problem solutions of farm implements through adequate farm power for sustainable agriculture.** **PSO 4: apply the comprehensive knowledge of engineering properties of agricultural produce**

			for upgrading the unit operation and further develop effective value added technologies and become strong in quality control. **PSO5: develop diverse capability to work with tractor and implement manufacturing industries, seed processing industries, irrigation and drainage companies and also to run self-entrepreneurship like dairy farming and custom hiring centers.** **PSO6: take up higher studies in reputed institutes and motive towards innovative research by applying their skills in agricultural water management, farm machinery and power, processing and energy management systems in agriculture.** **PSO7: understand the issues of ethics, safety, professionalism, cultural diversity, globalization, environmental impact and responsibility of serving the society and the environmental issues.**
	BOS (Agricultures)Date: 23/2/2019	**B. Tech. (Agriculture)** **1. MEL0101 Engineering Mechanics (1st semester)** **Credits (3-1-2)5**	CO1Determine the resultant force and moment for a given force system. Analyze planar and spatial systems to determine the forces in members of trusses, frames and problems related to friction. CO2Calculate the motion parameters for a body subjected to a given force system. CO3Determine the deformation of a shaft and understand the relationship between material constants CO4Determine the centroid and second moment of area CO5Determine the power transmission in belts 3 Theory period of Fifty minutes per week over a semester

			1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
		2.MEP 0101 **Mechanical Workshop** **(1st semester)** **Credits (0-0-2)1**	CO1Study and practice on machine tools and their operations CO2Practice on manufacturing of components using workshop trades including fitting carpentry, foundry and welding CO3Identify and apply suitable tools for machining processes including turning, facing thread cutting and tapping 2 Practical period of Fifty minutes per week over a semester
		3.MEL0202 **Engineering Graphics** **(2nd semester)** **Credits (2-1-2)4**	CO1 Draw orthographic projections of lines, planes and solids. CO2 Construct isometric scale, isometric projections and views CO3 Draw sections of solids including cylinders, cones, prisms and pyramids CO4 Draw projections of lines, planes, solids, isometric projections and sections of solids CO5 Draw projections OF cylinders, cones, prisms and pyramids using Auto CAD 2 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
		4 MEL0203 **Basic Mechanical Engineering** **Credits (3-1-2)5**	CO1 **Materials**: Classification of engineering material, composition of cast iron, CO2 **Measurements**: Temperature, pressure, velocity, flow, strain, force and torque CO3 **Manufacturing & Welding** Introduction to elementary manufacturing Processes: casting, pattern types, moulds

			CO4**Thermodynamics**First & Second law of thermodynamics, Carnot Cycle, Properties of steam, CO5 **Fluid mechanics** Definitions of fluid, Types of fluid, Fluid Properties, 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
		MEL 0309 Strength of material Credits (3-1-2)5	**CO1Understanding Stress and strain; normal, shear and bearing stresses;** **CO2Understanding Strain energy** **CO3Understanding State of stress, Generalized Hook's Law, stress transformation** **CO4Understanding Mohr's Circle representation for stress and strains** **CO5Understanding Bending of beams:** **CO6Understanding Torsion of Shafts** **CO7Understanding Pressure Vessels:** **3 Theory period of Fifty minutes per week over a semester** **1 Tutorial period of Fifty minutes per week over a semester** **2 Practical period of Fifty minutes per week over a semester**
		AGL 0301 Crop Production Technology Credits (3-1-0)4	**CO1 Concepts in crop production; geographical distribution of crops and cropping systems; economic importance.** **CO2 Modern Techniques of Raising Field and Horticultural Crops** **CO3 Seed and Seeding Practices Scheduling of Irrigation and Fertilizers** **CO4 Plant Protection Measures Pesticides types of weedicides and insecticides available to control** **CO5 Harvest and Post Harvest Operations--Method of harvesting; modern implements their efficiency and economics,** **3 Theory period of Fifty minutes per week over a semester**

			1 Tutorial period of Fifty minutes per week over a semester
		AGL 0302 Soil Technology Credits (3-1-2)5	**CO1 Soil genesis** Weathering, formation and composition of soil, **CO2 Engineering Properties of Soils** Water content; Unit weight of soil; Specific gravity; **CO3 Classification of Soils and Clay Mineralogy** Particle size classification; Textural classification; HRB classifications **CO4 Soli Hydraulics** Modes of occurrence of water in soils; Stress condition in soil; Permeability; **CO5 Stabilization of Soil and Site Investigation** Introduction; Method of Stabilization; Site exploration **3 Theory period of Fifty minutes per week over a semester** **1 Tutorial period of Fifty minutes per week over a semester** **2 Practical period of Fifty minutes per week over a semester**
		AGL 0304 Material science Credits (3-1-0)4	**CO1 Crystal Structures** Space lattice and crystal structures, Determination of Crystal structure by X-ray technique **CO2 Behavior of Materials** Elastic and viscoelastic behavior of materials, plastic deformation, strain hardening **CO3 Mechanical Properties of Materials** Tensile and compression test, shear test, fatigue test, hardness test, **CO4 Dielectric Materials** Principles, temperature and frequency effects, ferroelectric materials **CO5 Polymers & Other Materials** Types, properties, additives, application. Brief description of other material **3 Theory period of Fifty minutes per week over a semester** **1 Tutorial period of Fifty minutes per week over a semester**

		MEP 0302 Machine drawing Credits (0-0-2)1	**CO1 Drawing Conventions:** Drawing standards, first angle projection, orthographic views, sectioning and its rules **CO2 Conventional Representation** conventional representation of machine parts such as threads, slotted heads, square ends **CO3 Drawing of Agricultural fasteners:** Nut, bolt and washers, locking arrangements, rivets and heads **CO4 Assembly drawing of power transmission components:** Muff and flange couplings, solid and bushed journal bearings, pedestal bearing, **CO55 Computer aided drafting:** Software, graphic screen, setting of blank sheet for drawing, draw commands, **2 Practical period of Fifty minutes per week over a semester**
		MEL 0305 Basic thermodynamics Credits (3-1-2)5	CO1Understand the concepts of continuum, system, control volume, thermodynamic properties, thermodynamic equilibrium, work and heat CO2Apply the laws of thermodynamics to analyze boilers, heat pumps, refrigerators, heat engines, compressors and nozzles. CO3Evaluate the available energy and irreversibility. CO4Evaluate properties of pure substances and gas mixtures CO5Analyze air standard cycles applied in prime movers CO6Understand the heat transfer, energy conversion, Refrigeration & air conditioning, and I.C. Engines 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester

		<u>MEL 0407</u> **Fluid Mechanics** **(4rd semester)** **Credits (3-1-2)5**	CO1Apply conservation laws to fluid flow problems in engineering applications. CO2Design experimental investigations for properties of fluids CO3Compute drag and lift coefficients using the theory of boundary layer flows CO4Analyze and design free surface and pipe flows CO5Formulate and solve one dimensional compressible fluid flow problems 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
		AGL0406 **Hydrology** **Credits (3-1-0)4**	CO1 **Introduction** Hydrologic cycle; schematic diagram CO2 **Meteorological Parameters and Their Measurements.** Precipitation: Its different forms viz. snow, sleet, rain, hail etc CO3 **Precipitation Data Analysis and Runoff Estimation** Rainfall mass curve; Hyetograph; Mean rainfall depth; CO4 **Hydrograph and Flood Analysis** Hydrograph separation; Unit hydrograph theory: Unit graph of different duration CO5 **Ground Water Hydrology** Occurrence distribution and movement of ground water. **Hydrological Modeling** Introduction of basic concepts, 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester

		AGL0408 Kinematics and Dynamics of machines Credits (3-1-2)5	CO1 **Introduction --**Objective of the course and its application in design of various moving parts in mechanical systems as well as agricultural machinery. CO2 **-Balancing--** definition; Static and dynamic balancing; CO3 **Agricultural Machinery --**Mechanism used in crop production and processing machines CO4 **Gears and Gear Trains--**Classification of gears; Law of gearings; Forms of teeth; CO5 **Cam, Governors, Brakes and Dynamometers** 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
		AGL0409 Soil and water conservation engineering Credits (3-1-0)4	CO1 **Introduction--**Soil erosion, causes, types and its major effects. CO2 **Wind Erosion and Control** Mechanics of wind erosion, soil loss estimation, wind erosion control measures CO3 **Grassed Water Ways--**Design of grassed waterways. **Gully and Ravine Reclamation--**Gully control structures temporary and permanent; CO4 **Farm Pond and Earthen Embankment--** General description of earthen embankments, earth fill and rock fill dams, classification of earthing dams CO5 **Watershed Management --**Its objectives, preparation of watershed management and development plan. **Water harvesting-** Rain Water Harvesting & Storage Structures: 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester

