ADITYA ENGINEERING COLLEGE

An Autonomous Institutuion

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Recognised by UGC under sections 2(f) and 12(B) of UGC Act, 1956

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Department of Agricultural Engineering

B.Tech - AR17 - Course Articulation Matrix

Note: Correlation Levels are 1 or 2 or 3. Where 1- Slight(Low), 2 - Moderate(Medium), 3 - Substantial (High).

	CO Statements	POs												PSOs		
I SEM																
Course Code	**171HS1T01 - ENGLISH – I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Improve the language proficiency of the students in English with focus on LSRW skills	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
CO2	Develop communicative competency in the students to speak and write in formal and informal situations.	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
CO3	Ensure theoretical and practical knowledge of the students about coping with life.	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
CO4	Interpret things from a scientific perspective without being biased by emotions.	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
CO5	Inspire, inculcate and inform the stakeholders that inventions and contributions of great men are valuable and motivation	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
Course Code	**171BS1T01- MATHEMATICS-I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Associate linear differential equations of first order to various physical problems involving differential equations of first order	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Solve linear differential equations of higher order.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Solve linear systems of equations using the concept of rank, Gauss elimination, Gauss seidal method.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Find the eigen values and eigen vectors of matrices.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Associate the concepts of Partial Differentiation to maxima and minima of functions of several variables and to solve Partial differential equations.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171HS1T02 - ENVIRONMENTAL STUDIES**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Identify the need for protecting the producers and consumers in various ecosystems and their role in the food web.	-	-	-	-	-	1	3	-	-	-	-	-	-	-	-
CO2	Outline the natural resources and their importance for the sustenance of the life.	-	-	-	-	-	2	3	-	-	-	-	-	-	-	-
CO3	List out the biodiversity of India, threats and its conservation methods.	-	-	-	-	-	1	3	-	-	-	-	-	-	-	-

	CO Statements	POs												PSOs		
CO4	Explain the different types of pollutions and their control technologies, Waste water treatment, Bio medical waste management etc.	-	-	2	-	-	2	3	-	-	-	-	-	-	-	-
CO5	Explain EIA- Environmental Impact Assessment, Sustainable developmental activities, environmental policies and regulations	-	-	2	-	-	2	3	-	-	-	-	-	-	-	-
Course Code	**171BS1T03 - ENGINEERING CHEMISTRY**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain polymeric materials their uses and moulding techniques of plastics.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Analyse fuel characteristics using Calorific value, knocking characteristics and flue gas analysis.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Explain the working principle of Electro chemical cells and corrosion characteristics.	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Explain the properties and applications of Nano, Superconductors, Semiconductors, Liquid crystals and fuel cells.	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Summarize water purification techniques and boiler troubles.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171ES1T02 - ENGINEERING MECHANICS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Determine the resultant force and moment for a given force system.	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Explain the concept of friction.	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Calculate the forces in planar and spatial systems.	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Locate centroid of composite areas and centre of gravity of composite bodies.	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Calculate the moment of inertia of composite areas and rigid bodies.	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO6	Apply the concepts of kinematics, kinetics, work - energy and impulse - momentum methods to particle motion.	3	2	1	-	-	-	-	-	-	-	-	-	1	-	-
Course Code	**171ES1T01 -COMPUTER PROGRAMMING**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Apply fundamental of C for mathematical and scientific problems.	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Use Control Structures, Arrays and strings in solving complex problems.	1	2	2	3	-	-	-	-	-	-	-	-	-	-	-
CO3	Develop modular programs to solve problems using functions.	1	3	2	2	-	-	-	-	-	-	-	-	-	-	-
CO4	Demonstrate the pointers concept for allocating and deallocating memory dynamically.	1	2	2	3	-	-	-	-	-	-	-	-	-	-	-
CO5	Solve real world problems using the concept of files, structures and unions.	1	2	2	2	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171HS1L01 - ENGLISH COMMUNICATION SKILLS LAB- I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Make use of the concepts to communicate confidently and competently in English Language in all spheres.	-	-	-	-	1	-	-	-	-	3	-	1	-	-	-
CO2	Express Creative skills to construct Dialogues / Conversations in Spoken and Written forms.	-	-	-	-	1	-	-	-	-	3	-	2	-	-	-
CO3	Identify Accent for intelligibility.	-	-	-	-	1	-	-	-	-	3	-	2	-	-	-
CO4	Demonstrate communicative ability in everyday Conversation, JAM Sessions and Public Speaking.	-	-	-	-	1	-	-	-	-	3	-	1	-	-	-

	CO Statements	POs												PSOs		
CO5	Demonstrate nuances of Language through Audio – Visual Experience and group activities.	-	-	-	-	1	-	-	-	-	3	-	1	-	-	-
Course Code	**171BS1L01- ENGINEERING CHEMISTRY LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Demonstrate Acid –Complexometric titrations by volumetric analysis.	2	-	-	-	-	-	-	-	1	1	-	1	-	-	-
CO2	Demonstrate Acid – Base titrations by instrumental analysis.	2	-	-	-	-	-	-	-	1	1	-	1	-	-	-
CO3	Estimate Vitamin C using volumetric analysis.	2	-	-	-	-	-	-	-	1	1	-	1	-	-	-
CO4	Prepare polymer like Bakelite.	2	-	-	-	-	-	-	-	1	1	-	1	-	-	-
CO5	Prepare alternative fuel like Bio-Diesel.	2	-	-	-	-	-	1	-	1	1	-	1	-	-	-
Course Code	**171ES1L01 - COMPUTER PROGRAMMING LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Implement basic programs in C.	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-
CO2	Use Conditional and Iterative statements to solve real time scenarios in C.	-	2	2	3	2	-	-	-	-	-	-	-	-	-	-
CO3	Implement the concept of Arrays and Modularity.	-	3	2	2	2	-	-	-	-	-	-	-	-	-	-
CO4	Apply the Dynamic Memory Allocation functions using pointers.	-	2	2	3	2	-	-	-	-	-	-	-	-	-	-
CO5	Develop programs using structures, and Files.	-	2	2	2	2	-	-	-	-	-	-	-	-	-	-
II SEM																
Course Code	**171HS2T03 - ENGLISH - II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Compare the difference between traditional and modern technologies.	-	-	-	-	1	-	-	-	-	3	-	-	-	-	-
CO2	Identify the causes for climate change.	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
CO3	Infer professional work habits, necessary for effective collaboration and cooperation.	-	-	-	-	-	-	1	-	-	3	-	-	-	-	-
CO4	Develop competency in writing for political, social and religious documents.	-	-	-	-	-	-	1	-	-	3	-	-	-	-	-
CO5	Demonstrate writing and basic concepts of grammar skills.	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
Course Code	**171BS2T02 - MATHEMATICS-II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Apply various numerical methods to find roots of equations and interpolating polynomials.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Apply numerical methods to initial value problems and problems involving integration.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Find the Fourier series of a given function and study the convergence of the series.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Find the Fourier transforms for given functions.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Apply method of separation of variables to solve one dimensional heat equation and wave equation and two dimensional Laplace equations.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171BS2T06- MATHEMATICS-III**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Compute Laplace transform of various functions.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Apply Laplace transform to solve initial value problems.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Discuss about beta and gamma function, double integral over a region and triple integral over a volume.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-

	CO Statements	POs												PSOs		
CO4	Find the gradient of a scalar function, divergence and curl of a vector function.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Apply line, surface and volume integrals to find work done by a force, flux.	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171BS2T07- ENGINEERING PHYSICS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Make use of the basic concepts of interference and relate to the principle of interferometer.	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Relate the basic concepts of diffraction to illustrate the principle of optical instruments like Telescope & microscope.	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Explain the basic concepts of polarization, principle of polarimeter and the method of producing high intensity light beams.	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Explain the basic concepts of sound waves, ultrasonics, crystal structure and X-ray diffraction Techniques.	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Classify different types of solids, to use the appropriate solid as per its magnetic and dielectric properties.	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171ES2T03 - ENGINEERING DRAWING**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Sketch the polygons, conics and scales by using the principles of drawing.	3	2	1	-	-	-	-	-	-	-	-	-	1	-	-
CO2	Draw Orthographic projections of points and lines.	3	2	1	-	-	-	-	-	-	-	-	-	1	-	-
CO3	Draw Orthographic projections of planes in various positions.	3	2	1	-	-	-	-	-	-	-	-	-	1	-	-
CO4	Draw Orthographic projections of solids in various positions.	3	2	1	-	-	-	-	-	-	-	-	-	1	-	-
CO5	Construct isometric scale and isometric projections.	3	2	1	-	2	-	-	-	-	-	-	-	1	-	-
CO6	Convert isometric view in to orthographic views.	3	2	1	-	2	-	-	-	-	-	-	-	1	-	-
Course Code	**171ES2T08 - THEORY OF MACHINES**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Determine the velocity and acceleration for different mechanisms by graphical and analytical methods.	3	2	1	-	-	-	-	-	-	-	-	-	3	-	-
CO2	Compute the parameters of mechanical components for power transmission.	3	2	1	-	-	-	-	-	-	-	-	-	3	-	-
CO3	Determine the parameters of gears and gear trains.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
CO4	Determine the parameters for various types of governors.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
CO5	Calculate the balancing forces of rotating and reciprocating masses.	3	2	1	1	-	-	-	-	-	-	-	-	3	-	-
CO6	Calculate the weight and moment of inertia of fly wheels.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
Course Code	**171HS2L02- ENGLISH COMMUNICATION SKILLS LAB- II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Make effective use of Body language in all situations and contexts to enhance effective communication in all aspects.	-	-	-	-	-	-	-	-	-	3	-	2	-	-	-
CO2	Identify communicative competency to respond to others in different situations.	-	-	-	-	-	-	-	-	-	3	-	2	-	-	-
CO3	Make use of effective delivery strategies to select, compile and synthesize information for oral presentation.	-	-	-	-	-	-	-	-	-	3	-	2	-	-	-

	CO Statements	POs												PSOs		
CO4	Demonstrate in mock interviews, group discussion and public speaking.	-	-	-	-	-	-	-	-	-	3	-	2	-	-	-
CO5	Illustrate interpersonal skills using English language confidently and effectively for personal and professional growth.	-	-	-	-	-	-	-	-	-	3	-	2	-	-	-
Course Code	**171BS2L02 - ENGINEERING PHYSICS LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Use spectrometer, polarimeter, travelling microscope for making measurements.	3	2	-	-	-	-	-	-	1	-	-	1	-	-	-
CO2	Determine energy gap of a semiconductor, draw characteristic curves to estimate thermal coefficient of a thermistor, zener diode.	2	2	-	-	-	-	-	-	1	-	-	1	-	-	-
CO3	Determine the rigidity and determine frequency of an unknown electric vibrator.	3	1	-	-	-	-	-	-	1	-	-	1	-	-	-
CO4	Determine wavelength of unknown source, the width of narrow slits, spacing Between close rulings using lasers and appreciate the accuracy in measurements.	3	2	-	-	-	-	-	-	1	-	-	1	-	-	-
CO5	Verify magnetic field along the axis of a circular coil.	3	2	-	-	-	-	-	-	1	-	-	1	-	-	-
Course Code	**171ES2L02 - ENGINEERING WORKSHOP AND IT WORKSHOP**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Prepare carpentry, fitting joints as per the given requirement using Carpentry and Fitting tools.	2	1	-	-	-	-	-	-	1	-	-	-	-	-	-
CO2	Convert the metal rods and sheets into final shape using black smithy and tin smithy tools.	2	1	-	-	-	-	-	-	1	-	-	-	-	-	-
CO3	Prepare the circuit for house wiring applications.	2	1	-	-	-	-	-	-	1	-	-	-	-	-	-
CO4	Install the operating system software, networking and troubleshoot the problems.	2	1	-	-	-	-	-	-	1	-	-	1	-	-	-
CO5	Develop documents using MS-Office and LaTeX tools.	2	1		-	-	-	-	-	1	-	-	1	-	-	-
III SEM																
Course Code	**171AG3T01- PRINCIPLES OF SOIL SCIENCE AND AGRONOMY**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain about the mode of formation of rocks, minerals and processes of weathering and soil forming.	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-
CO2	Explain about importance of soil structure, soil consistency, soil air and soil temperature.	1	2	-	-	-	-	-	-	-	-	-	1	-	2	-
CO3	Explain the role of beneficial organisms in enriching the soil, availability of plant nutrients and problematic soils.	1	-	3	-	-	-	-	-	-	-	-	2	-	3	-
CO4	Classify crops based on origin, agronomic, ontogeny, season and special purpose.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO5	Explain about tillage, types of tillage, Methods of sowing, weed management, and problems of dryland farming.	-	2	3	-	-	-	-	-	-	-	-	2	-	2	-
Course Code	**171AG3T02- RENEWABLE ENERGY SOURCES**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Classify the different solar geometry, solar measuring devices and solar collectors.	2	1	-	-	-	-	1	-	-	-	-	-	1	-	-

	CO Statements	POs												PSOs		
CO2	Identify storage and application techniques of solar energy.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO3	Analyze the wind energy concepts and wind mill.	2	3	-	-	-	-	-	-	-	-	-	-	1	-	-
CO4	Identify the methods and principles of bio mass conversion and different biogas plants.	1	1	2	-	-	-	1	-	-	-	-	-	2	-	-
CO5	Categorize different geothermal and ocean energy resources.	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO6	Identify the different modern energy conversion technologies.	2	1	-	-	1	-	-	-	-	-	-	-	1	-	-
Course Code	**171AG3T03 - GROUNDWATER HYDROLOGY, WELLS AND PUMPS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain scenario, types and properties of various water bearing formations.	1	-	-	-	-	-	-	-	-	-	-	1	-	2	-
CO2	Select appropriate method for exploration and replenishment of groundwater.	-	2	-	-	3	-	1	-	-	-	-	1	-	3	-
CO3	Explain design, development and construction of wells.	-	-	3	2	-	-	-	-	-	-	-	1	-	3	-
CO4	Determine the aquifer properties under unsteady state and steady state subsurface flow conditions.	1	-	2	-	-	-	-	-	-	-	-	-	-	2	-
CO5	Explain the types, working principles with components and diagram of various water lifting devices.	1	-	-	-	-	-	-	-	-	-	-	-	-	2	-
CO6	Select the pump for irrigation by considering performance characteristics, installation and troubleshooting.	-	-	-	-	3	-	-	-	-	-	-	2	-	3	-
Course Code	**171ES3T19 - PROPERTIES AND STRENGTH OF MATERIALS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Compare the physical properties and uses of basic building and Engineering materials.	2	1	-	-	2	-	-	-	-	-	-	-	-	1	-
CO2	Illustrate types of stresses, strains and elastic constants.	2	1	-	-	2	-	-	-	-	-	-	-	-	1	-
CO3	Explain the basic concepts of Oblique stresses developed when subjected to Direct stresses in one plane and two planes- accompanied by shear stress.	2	1	-	-	2	-	-	-	-	-	-	-	-	1	-
CO4	Analyse the deflections in beams under various loading and support conditions.	3	2	-	-	2	-	-	-	-	-	-	-	-	1	-
CO5	Solve the load carrying capacity of columns for different end conditions.	3	2	-	-	2	-	-	-	-	-	-	-	-	1	-
CO6	Design of riveted and welded joints.	3	2	-	-	2	-	-	-	-	-	-	-	-	1	-
Course Code	**171ES3T20 - ELECTRICAL AND ELECTRONICS ENGINEERING**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Analyze the various electrical networks.	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Examine the performance of single-phase transformer.	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Demonstrate the operation of DC generators, 3-point starter and DC machine testing by Swinburne's Test.	2	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Compare the operation of 1-Phase and 3-phase induction motors.	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-
CO5	Distinguish the operation of half wave, full wave bridge rectifiers, and types of transistors.	3	2	2	1	-	-	-	-	-	-	-	-	-	-	-

	CO Statements	POs												PSOs		
Course Code	**171ES3T21 - SURVEYING AND LEVELING**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Use the linear and angular distances using chain, compass instruments.	2	1		-	-	-	-	-	-	-	-	-	-	1	-
CO2	Make use of appropriate techniques in order to estimate the level of existing ground.	3	2	1	-	-	-	-	-	-	-	-	-	-	1	-
CO3	Solve height and distances problems using Theodolite and Tachometry.	2	1		-	-	-	-	-	-	-	-	-	-	1	-
CO4	Utilize various advanced surveying equipment for large projects.	3	2	2	-	-	-	-	-	-	-	-	-	-	1	-
CO5	Determine regular, irregular areas and volumes of given field	3	2	1	-	-	-	-	-	-	-	-	-	-	2	-
Course Code	**171AG3L01 - SOIL SCIENCE AND AGRONOMY FIELD LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain about soil profile and collection of soil samples..	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
CO2	Determine soil density, soil moisture, pH and EC using standard methods.	2	2	-	1	-	-	-	-	-	-	-	-	-	3	-
CO3	Measure infiltration and evaporation rate in soil using standard procedure.	1	1	-	-	-	-	-	-	-	-	-	-	-	2	-
CO4	Make use of different implements for practicing ploughing, seed bed preparation, sowing, weeding, fertilizer application, harvesting.	-	-	-	-	2	-	-	-	-	-	-	-	-	3	-
CO5	Identify different crops, seeds, manures and fertilizers.	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171ES3L11 - SURVEYING AND LEVELING LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	List and handle different surveying instruments.	2	1		-	-	1	-	-	-	-	-	-	-	1	-
CO2	Estimate the levels of existing ground and prepare contour plan.	3	2	1	-	-	2	-	-	-	-	-	-	-	1	-
CO3	Develop the plan or map showing the ground features from data obtained by surveying.	2	1		-	-	-	-	-	-	-	-	-	-	1	-
CO4	Make use of advanced surveying equipments to avoid manual errors.	3	2	2	-	-	1	-	-	-	-	-	-	-	1	-
CO5	Identify layout curves for roads and computation of areas and volumes.	3	2	1	-	-	2	-	-	-	-	-	-	-	1	-
Course Code	**171HS3A09-Professional Ethics and Human Values**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Make use of values, morals and ethics in their day to day life.	-	-	-	-	-	-	-	2	-	-	-	-	1	-	-
CO2	Identify what is right and wrong through moral ethics.	-	-	-	-	-	-	-	2	-	-	-	-	1	-	-
CO3	Analyze experimental learning while developing the society with ethics.	-	-	-	-	-	-	-	2	-	-	-	-	1	-	-
CO4	Apply ethical principles to resolve the problems that arise in work place.	-	-	-	-	-	-	-	2	-	-	-	-	1	-	-
CO5	Apply adequate knowledge on global code of conduct.	-	-	-	-	-	-	-	2	-	-	-	-	1	-	-
Course Code	**171HS3A10 - Employability Skills – I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Solve problems of Series & Analogy for Numbers and Letters	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO2	Solve problems on Coding & Decoding and Divisibility rules	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO3	Solve problems on LCM & HCF and Simple Equations	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO4	Demonstrate Attitude, self-confidence and decision making in different situations	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-

	CO Statements	POs												PSOs		
CO5	Develop out of box and lateral thinking, better goal setting and time management	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
IV SEM																
Course Code	**171AG4T04- THERMODYNAMICS AND REFRIGERATION SYSTEMS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the basic concepts and laws of thermodynamics.	3	2	1	-	-	2	-	-	-	-	-	-	-	-	3
CO2	Discuss the working principle and performance of 4 stroke and 2-stroke Diesel and Petrol Engines.	3	2	-	-	-	2	-	-	-	1	-	-	-	-	3
CO3	Explain the various refrigeration cycles, their applications and performance.	3	1	-	-	-	2	1	-	-	-	-	-	-	-	3
CO4	Distinguish working principles various refrigeration systems.	3	1	-	-	-	-	-	-	-	2	-	-	-	-	3
CO5	Discuss various Psychometric processes, their Properties and storage.	3	2	1	-	-	2	-	-	-	-	-	-	-	-	3
Course Code	**171AG4T05 - HEAT AND MASS TRANSFER**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the basic modes of heat transfer and the principles of conductive heat transfer for different bodies.	3	2	1	1	-	-	-	-	-	-	-	-	-	-	1
CO2	Interpret forced and free convection heat transfer mechanism.	3	2	1	1	-	-	-	-	-	-	-	-	-	-	2
CO3	Determine the heat transfer performance of the extended surfaces.	3	2	2	2	-	-	-	-	-	-	-	-	-	-	3
CO4	Apply LMTD & NTU for designing of heat exchangers.	3	2	1	1	-	-	-	-	-	-	-	-	-	-	2
CO5	Explain the principles of radiation heat transfer and mass transfer.	3	1	-	2	-	-	-	-	-	-	-	-	-	-	2
Course Code	**171ES4T25 - FLUID MECHANICS AND OPEN CHANNEL HYDRAULICS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Interpret the various properties of fluids and their influence on fluid motion.	2	1	-	-	-	-	2	-	-	-	-	-	-	2	-
CO2	Solve problems on pressure measurement, hydrostatic forces on submerged bodies and continuity equation.	3	1	-	-	-	-	2	-	-	-	-	-	-	2	-
CO3	Apply the knowledge of Dynamics to Solve problems on Bernoulli's equation and its applications and also calculating thickness of boundary layer.	2	1	-	-	-	-	-	-	-	-	-	-	-	2	-
CO4	Solve problems on meta centric heights of floating bodies and measurement of discharge in closed and open channels.	3	2	-	-	-	-	2	-	-	-	-	-	-	2	-
CO5	Determine losses and discharges in simple and compound pipes.	2	2	-	-	-	-	2	-	-	-	-	-	-	2	-
CO6	Solve the problems on economical sections, critical depth and specific energy for various channels.	1	2	-	-	-	-	3	-	-	-	-	-	-	2	-
Course Code	**171AG4T06 - SOIL MECHANICS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Classify the soil at field conditions and able to determine nature of soil it exist.	2	1	-	-	-	2	-	-	-	-	2	-	-	1	-
CO2	Calculate the vertical pressure distribution for different load conditions	2	1	-	-	-	2	-	-	-	-	2	-	-	1	-
CO3	Determine the shear strength of soils through theoretical shear parameters.	3	2	-	-	-	2	-	-	-	-	2	-	-	1	-

	CO Statements	POs												PSOs		
CO4	Calculating the different engineering properties of the soil such as compaction, consolidation determines them in the laboratory.	3	2	-	-	-	2	-	-	-	-	2	-	-	1	-
CO5	Calculate the factor of safety for various retaining structures.	3	2	-	-	-	2	-	-	-	-	2	-	-	1	-
Course Code	**171AG4T07 - SURFACE WATER HYDROLOGY**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Calculate the mean areal precipitation using various methods.	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-
CO2	Explain rainfall characteristics and measuring devices in India.	2	1	-	-	2	-	-	-	-	-	-	-	-	2	-
CO3	Explain runoff and stream flow measurement methods.	2	1	-	-	2	-	-	-	-	-	-	-	-	2	-
CO4	Estimate the discharge volume of runoff using hydrographs and unit hydrographs.	2	-	-	2	3	-	-	-	-	-	-	-	-	2	-
CO5	Apply various hydrograph techniques to convert multiple duration graph into single duration vice-versa.	1	2	-	-	3	-	-	-	-	-	-	-	-	2	-
CO6	Plan a reservoir using flood routing techniques for management of natural resources.	2	2	-	-	3	-	-	-	-	-	-	2	-	3	-
Course Code	**171AG4T08 - ENGINEERING PROPERTIES OF BIOLOGICAL MATERIALS AND FOOD QUALITY**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Choose the basic applications and importance of engineering properties in handling and processing equipment and also storage structures.	2	2	3	2	-	-	-	-	-	-	-	-	-	-	3
CO2	Analyze the Maxwell and Kelvin model equations in the rheology for important biological materials.	3	1	1	-	1	-	-	-	-	-	-	-	-	-	3
CO3	Explain about frictional, electrical, thermal and aerodynamics properties of food and biological materials to process design and quality control.	3	2	2	2	-	-	-	-	-	-	-	-	-	-	3
CO4	Classify the different types of sampling techniques and sampling procedures for liquid, powdered and granular materials.	2	3	2	2	-	-	-	-	-	-	-	-	-	-	3
CO5	Explain total quality management (TQM), food laws, food standards and HACCP.	3	2	-	-	-	-	-	2	-	-	1	-	-	-	3
Course Code	**171ES4L14 - FLUID MECHANICS AND OPEN CHANNEL HYDRAULICS LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain Fluid Properties.	2	1	-	-	2	1	-	-	-	-	-	-	-	1	-
CO2	Illustrate Flow Measuring Devices used in pipes, channels and Tanks.	2	1	-	-	3	2	-	-	-	-	-	-	-	2	-
CO3	Determine major and minor losses in pipes.	3	2	-	-	2	-	-	-	-	-	-	-	-	1	-
CO4	Demonstrate the flow behaviour in open channels.	2	2	-	-	2	1	-	-	-	-	-	-	-	3	-
CO5	Examine the performance characteristics of pumps.	3	2	-	-	2	2	-	-	-	-	-	-	-	3	-
Course Code	**171ES4L15- MACHINE DRAWING AND COMPUTER GRAPHICS LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the conventional representation of materials and machine components.	2	-	-	-	-	-	-	-	-	2	-	-	-	-	-
CO2	Assemble the drawings of various machine components.	3	-	-	-	-	-	-	-	-	2	-	-	1	-	-

	CO Statements	POs												PSOs		
CO3	Describe various types of temporary and permanent fasteners.	3	-	-	-	-	-	-	-	-	2	-	-	-	-	-
CO4	Practice assembly drawings from the given part drawings for manufacturing.	3	-	-	-	-	-	-	-	-	2	-	-	2	-	-
CO5	Practice different components using AUTOCAD software.	3	-	-	-	2	-	-	-	-	2	-	-	2	-	-
Course Code	**171HS4A11- Employability Skills – II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Examine the symbols, notations and Venn -diagrams.	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO2	Solve different types of number systems problems.	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO3	Solve ratio & proportion, ages and averages by using simple logic.	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO4	Apply negotiation skills and leadership skills in a team	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
CO5	Apply listening skills and verbal skills of communication in a team	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
Course Code	**171HS4A08- Intellectual Property Right and Patents**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Compare various types of Intellectual Property rights.	-	-	-	-	-	-	-	3	-	-	-	2	-	-	-
CO2	Discuss Intellectual Property and infer rights on such Intellectual Property owners	-	-	-	-	-	-	-	3	-	-	-	2	-	-	-
CO3	Explain the process of patenting	-	-	-	-	-	-	-	3	-	-	-	2	-	-	-
CO4	Apply for trade marks and trade secrets.	-	-	-	-	-	-	-	3	-	-	-	2	-	-	-
CO5	Interpret the legal issues on Intellectual Property Rights and cyber laws	-	-	-	-	-	-	-	3	-	-	-	2	-	-	-
	V SEM															
Course Code	**171AG5T09- THEORY OF STRUCTURES**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Analysis and design of singly and doubly reinforced beams.	2	1	-	-	-	-	-	-	-	-	-	-	-	1	-
CO2	Design the structures subjected to shear, bond and torsion.	3	2	2	-	-	-	-	-	-	-	-	-	-	1	-
CO3	Determine the reinforcement details of flexural members & axially loaded columns.	3	2	2	-	-	-	-	-	-	-	-	-	-	1	-
CO4	Design of one-way and two-way slabs.	2	2	2	-	-	-	-	-	-	-	-	-	-	1	-
CO5	Design of isolated footings.	2	2	1	-	-	-	-	-	-	-	-	-	-	1	-
CO6	Solve problems on retaining walls under stability conditions.	3	2	-	-	-	-	-	-	-	-	-	-	-	1	-
Course Code	**171AG5T10 - IRRIGATION AND DRAINAGE ENGINEERING**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Apply irrigation terminology, soil moisture characteristic curves and evapotranspiration methods to quantify crop water requirement.	1	-	-	-	-	-	-	-	-	-	-	-	-	2	-
CO2	Choose appropriate irrigation methods, advantages, disadvantages, hydraulics design and components.	-	2	-	-	3	-	2	-	-	-	-	2	-	3	-
CO3	Estimate irrigation canals capacity by lacey's and kennedy's methods.	1	-	3	2	2	-	-	-	-	-	-	-	-	3	-
CO4	Identify types, functions, components and factors affecting on surface and sub-surface drainage systems.	-	1	-	-	2	-	-	-	-	-	-	-	-	3	-
CO5	Determine drain spacing under unsteady and steady state conditions by Hooghoudt's and Glover Dumm equations.	-	1	2	1	3	-	-	-	-	-	-	-	-	3	-

	CO Statements	POs												PSOs		
Course Code	**171AG5T11 - AGRICULTURAL PROCESS ENGINEERING**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the functions of various unit operations and size reduction in processing of agriculture produce.	3	1	1	1	-	-	-	-	-	-	-	-	-	-	3
CO2	Explain the working of size reduction Equipments for processing of fibrous and dry particulate foods.	3	1	2	2	-	-	-	-	-	-	-	-	-	-	3
CO3	Explain the design and working of mixing equipment's for powder, high and low viscosity liquids.	3	1	2	2	-	-	-	-	-	-	-	-	-	-	3
CO4	Classify separator equipment's based on physical characteristics of grains.	3	2	1	2	-	-	-	-	-	-	-	-	-	-	3
CO5	Identify various methods for determining moisture content and EMC.	3	1	1	1	-	-	-	-	-	-	-	-	-	-	2
CO6	Explain the importance, design and working of milling and material handling devices.	3	2	2	2	-	-	-	-	-	-	-	-	-	-	3
Course Code	**171AG5T12 - AGRICULTURAL EXTENSION TECHNIQUES AND BUSINESS MANAGEMENT**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Demonstrate individual, group and mass contact ways of managing agricultural extension and communication.	-	-	-	-	-	-	-	-	2	3	1	-	1	-	-
CO2	Relate agricultural extension communication approaches, tools and package to the needs of farmers.	-	-	-	-	-	-	2	-	2	3	1	-	2	-	1
CO3	Identify adopters and appropriate agricultural enhancement and training programs.	-	-	-	-	-	-	-	1	2	2	3	-	1	-	-
CO4	Identify small scale agriculture industries project using project appraisal techniques	-	-	-	-	-	2	-	-	-	2	3	-	-	-	2
CO5	Explain different trade, trade related intellectual property rights and EXIM policy (FTP).	-	-	-	-	-	2	-	1	-	3	-	-	-	-	1
CO6	Explain the structure and agreements in WTO.	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Course Code	**171AG5T13 - FARM POWER AND TRACTOR SYSTEMS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the various energy sources of farm power and types I.C. engines	3	1	-	-	-	-	-	-	-	-	2	2	1	-	-
CO2	Explain various I. C. engine systems with their construction details.	2	3	-	-	-	-	-	-	-	-	1	1	2	-	-
CO3	Identify different tractor systems with their functions and working principles.	3	2	-	-	-	-	-	-	-	-	-	-	3	-	-
CO4	Explain traction theory, center of gravity of tractor and mechanics of tractor chassis.	3	2	-	1	-	1	-	-	-	-	-	-	3	-	-
CO5	Apply various testing procedures for testing of tractor and Engine performance.	2	2	-	-	3	-	-	-	-	-	-	1	1	-	-
Course Code	**171AG5E01 - AGRO INDUSTRIES AND BI-PRODUCT UTILIZATION (PROFESSIONAL ELECTIVE - I)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Analyze the basic applications of agro industries and bi- products utilization, importance of rice husk and their uses and rice husk combustion.	2	2	-	-	-	1	3	-	-	-	-	-	-	-	2

	CO Statements	POs												PSOs		
CO2	Describe the manufacturing of alcohol processes and production of furfural.	2	1	-	1	-	-	3	-	-	-	-	-	-	-	2
CO3	Explain by-products of coconut, mango, cashew nut and banana.	2	1	-	-	-	-	-	-	1	-	3	-	-	-	3
CO4	Explain about the feed manufacturing equipments, paper making process and different types of sugarcane bi-products.	2	1	-	-	-	-	-	-	1	-	3	-	-	-	3
CO5	Explain the biological treatment with their advantages and disadvantages.	3	-	-	1	-	1	-	1	-	-	-	-	-	-	1
CO6	Explain the types of aeration systems and briquetting process, principles and factors affecting for establishing of agro processing.	3	2	-	1	-	-	1	-	-	-	-	-	-	-	2
Course Code	**171HS5E01 - MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS (PROFESSIONAL ELECTIVE - I)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the Managerial Economic concepts for decision making and forward planning.	-	-	-	-	-	-	-	-	**1**	-	-	-	-	-	-
CO2	Illustrate the law of demand and its exceptions, to use different forecasting methods for predicting demand for various products and services	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
CO3	Identify the cost behaviour, costs useful for managerial decision making and Break Even Point (BEP) of an enterprise.	**1**	**1**	-	-	-	-	-	-	-	-	1	-	-	-	-
CO4	Outline the different types of business organizations along with basic knowledge on business cycle.	-	-	-	-	-	-	-	-	-	-	**1**	-	-	-	-
CO5	Make use of the process & principles of accounting and prepare Journal, Ledger, Trial Balance, Trading A/c., Profit & Loss A/c. and Balance Sheet of an enterprise.	**1**	**1**	-	-	-	-	-	-	-	3	-	-	-	-	-
CO6	Utilize various techniques on investment project proposals with the help of capital budgeting techniques for decision making.	**1**	**1**	-	-	-	-	-	-	-	-	**2**	-	-	-	-
Course Code	**171AG5E02 - RURAL WATER SUPPLY, SANITATION AND ENVIRONMENTAL ENGINEERING (PROFESSIONAL ELECTIVE - I)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain rural water quality monitoring and surveillance.	-	-	-	-	1	2	-	-	-	2	-	-	-	1	-
CO2	Explain wastewater collection system, treatment and disposal of wastewater in rural areas.	-	-	-	-	-	2	-	-	-	2	-	3	-	1	-
CO3	Apply eco-friendly technologies in order to maintain hygienic conditions.	-	-	-	-	2	2	-	-	-	1	-	1	-	1	-
CO4	Demonstrate the human activities that are detrimental to environment.	-	-	1	-	2	-	-	-	-	2	-	1	-	1	-
CO5	Create solutions that conserve and help to maintain biodiversity in the long term.	-	-	2	-	-	-	-	-	-	2	-	3	-	1	-
Course Code	**171HS5T06 - Employability Skills – III**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain different types of puzzles,group reasoning,clock and calender problems	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO2	Solve problems on cubes & dice, partnership, percentages.	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-

	CO Statements	POs												PSOs		
CO3	Solve problems on profit and loss, simple interest and compound interest	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO4	Apply interviewing skills, Group discussion skills and personal priorities	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
CO5	Apply resume writing skills, e-mail writing & business etiquette	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-
Course Code	**171AG5L02 -AGRICULTURAL PROCESS ENGINEERING LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the basic operation of engineering properties in handling and processing equipment.	3	2	2	-	-	-	-	-	-	-	2	-	-	-	1
CO2	Construct the flow chart and layout of a food processing plant.	2	1	-	-	-	-	2	-	-	-	3	-	-	-	2
CO3	Determine the efficiency of cyclone separator, mixing index of mixers, and fineness modulus and uniformity index and power requirement in different types of conveyors.	3	2	1	1	-	-	-	-	-	-	-	-	-	-	3
CO4	Solve problems on psychometric chart.	3	2	2	2	-	-	-	-	-	-	-	-	-	-	2
CO5	Demonstrate the operations of hammer mill, attribution mill, pneumatic separator, indented cylinder and screen pre cleaner.	3	1	1	-	-	2	-	-	-	-	-	-	-	-	-
Course Code	**171AG5L03 -FIELD OPERATIONS AND MAINTENANCE OF TRACTORS LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Demonstrate makes and models of 4-wheel and 2-wheel drive tractors with their controls.	3	-	-	-	-	-	-	-	1	1	-	2	1	-	-
CO2	Apply tractor driving rules in practice of tractor driving.	3	-	-	-	-	-	-	-	-	-	-	1	2	-	-
CO3	Explain maintenance of various tractors and their systems.	2	3	-	2	-	-	-	-	-	-	1	-	3	-	-
CO4	Identify troubles in all systems of tractors and also their remedial measures.	2	3	2	1	-	-	-	-	-	-	-	-	3	-	-
CO5	Explain tips for storage and over handling of tractors.	3	1	-	-	2	-	-	-	1	-	-	-	2	-	-
VI SEM																
Course Code	**171AG6T14 - SOIL AND WATER CONSERVATION ENGINEERING**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Identify different types of erosions and quantify the annual soil loss from a watershed using USLE .	1	1	2	-	-	-	-	-	-	-	-	-	-	2	-
CO2	Explain mechanics of wind erosion, control measures and land use capability classification.	1	1	2	-	-	-	-	-	-	-	-	-	-	3	-
CO3	Determine the peak runoff rate by rational method and runoff by curve number and cook's methods.	1	1	2	-	2	-	-	-	-	-	-	-	-	3	-
CO4	Design of contour bunds, graded bunds and terraces.	1	1	2	-	-	-	2	-	-	-	-	-	-	1	-
CO5	Demonstrate the concept of sedimentation and vegetated grassed water ways.	1	-	1	-	1	-	-	-	-	-	-	-	-	2	-
CO6	Recommend the structures like simple earthen dam, ponds and gully control structures at appropriate place of watershed.	-	-	-	-	-	2	2	-	-	-	-	-	-	3	-

	CO Statements	POs												PSOs		
Course Code	**171AG6T15 - FARM MACHINERY AND EQUIPMENT-I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	PSO1	**PSO2**	**PSO3**
CO1	Identify the needs and benefits of farm mechanization.	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	Explain the different type's equipment's for tillage operations.	3	1	-	-	-	-	-	-	-	-	2	-	1	-	-
CO3	Analyse the forces acting on different implements.	1	2	-	-	-	-	-	-	-	-	-	-	3	-	-
CO4	Classify different sowing, transplanting and fertilizer application methods and equipments.	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO5	Explain plant protection, weeding and earth moving equipments.	3	-	-	-	-	1	-	-	-	-	2	-	2	-	-
CO6	Estimate the cost economics of different field operations.	1	3	-	-	-	-	-	-	-	-	-	1	2	-	-
Course Code	**171AG6T16 - DESIGN OF SOIL, WATER CONSERVATION AND FARM STRUCTURES**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the concept of critical depth, hydraulic jump and stage-discharge relationship.	1	-	-	1	-	-	-	-	-	-	-	-	-	1	-
CO2	Explain about runoff measuring structures.	1	1	1	2	-	-	-	-	-	-	-	-	-	2	-
CO3	Explain various permanent gully control structures.	1	1	2	-	-	-	-	-	-	-	-	-	-	3	-
CO4	Design of diversion structures and canal falls.	1	1	2	-	-	-	-	-	-	-	-	-	-	3	-
CO5	Illustrate the concept of cross drainage works.	1	1	1	-	-	-	-	-	-	-	-	-	-	3	-
CO6	Plan appropriate structure like farmstead, farm fences, dairy barns and grain storage structures in an integrated farm.	-	1	3	1	2	-	-	-	-	-	-	-	-	3	-
Course Code	**171AG6T17 - POST HARVEST ENGINEERING FOR HORTICULTURAL PRODUCE**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain about various properties and factors affecting quality of fruits and vegetables.	3	2	2	2	-	-	-	-	-	-	-	-	-	-	2
CO2	Classify various post harvest operations involved in horticulture processing.	3	1	1	1	-	-	-	-	-	-	-	-	-	-	3
CO3	Identify various preservation techniques for processed foods.	3	2	2	2	-	-	-	-	-	-	-	-	-	-	3
CO4	Apply the advanced packaging technology in food preservation.	3	2	2	2	-	-	-	-	-	-	-	-	-	-	3
CO5	Categorize different beverages based on method of preparation.	3	1	1	1	-	-	-	-	-	-	-	-	-	-	2
CO6	Explain the procedure for extraction of oleoresins and essential oils.	3	1	1	1	-	-	-	-	-	-	-	-	-	-	2
Course Code	**171AG6E03 - GIS AND REMOTE SENSING (PROFESSIONAL ELECTIVE - II)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain Remote Sensing and GIS concepts and components.	-	-	-	-	2	-	-	-	-	-	-	2	-	1	-
CO2	Assess spectral data and sensors potential for spatial analysis.	1	-	-	2	1	-	-	-	-	-	-	-	-	1	-
CO3	Apply image interpretation technique to interpret and DIP technique to correct remotely sensed image.	1	-	-	3	2	-	-	-	-	-	-	-	-	1	-
CO4	Apply image enhancement techniques to enhance and improve remotely sensed image.	1	-	-	3	2	-	-	-	-	-	-	-	-	1	-
CO5	Apply remote sensing image interpretation technique for the advanced uses of agriculture.	1	-	-	-	2	2	1	-	-	-	-	-	-	3	-
CO6	Use different GIS soft wares and knowledge of GIS to do spatial data analysis.	1	-	-	2	3	-	1	-	-	-	-	-	-	3	-

	CO Statements	POs												PSOs		
Course Code	**171AG6E04 - HUMAN ENGINEERING AND SAFETY (PROFESSIONAL ELECTIVE - II)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain man-machine-environmental factors.	2	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	Explain anthropometric principles for work space design.	1	-	3	-	-	-	2	-	-	-	-	-	3	-	-
CO3	Explain Skeletal and Muscular System of Human body.	1	-	-	3	-	2	-	-	-	-	-	-	2	-	-
CO4	Explain the factors affecting the work capacity.	1	-	-	-	-	1	-	-	-	-	-	-	2	-	-
CO5	Measure the sound and noise levels at work place.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO6	Demonstrate safety measures and regulation acts.	3	2	-	-	-	-	1	-	-	-	-	-	3	-	-
Course Code	**171AG6E05 - PRODUCTION TECHNOLOGY OF AGRICULTURAL MACHINERY (PROFESSIONAL ELECTIVE - II)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Calculate the stresses in agricultural machinery components.	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO2	Select the type of cutting and finishing tool based on the conditions	2	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO3	Explain the preparation and characteristics of metal powders.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Illustrate the Limits fits & tolerances and also essential features of jigs & fixtures.	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Explain the CNC controlling and part programming in machine control units.	1	2	-	-	1	-	-	-	-	-	-	1	1	-	-
Course Code	**171AG6E06- GREEN HOUSE/POLYHOUSE TECHNOLOGY (PROFESSIONAL ELECTIVE - III)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Design small scale polyhouse for drying purpose.	3	2	1	-	-	-	-	-	-	-	2	-	-	3	-
CO2	Select polyhouses based on construction materials.	3	2	-	-	-	-	-	1	-	-	-	-	-	2	-
CO3	Explain the scenario of protective cultivation around the globe and in India.	3	1	-	-	1	-	-	-	-	-	-	-	-	3	-
CO4	Make use of non-chemical and chemical pesticides and growth regulators effectively in an environmentally responsible way.	1	-	1	-	-	-	2	3	-	-	-	-	-	2	-
CO5	Assess the basic production requirements and the knowledge of horticulture crop cultivation in greenhouse	3	-	-	-	-	-	2	-	-	-	-	-	-	1	1
Course Code	**171AG6E07 - OPTIMIZATION, OPERATION RESEARCH AND SYSTEMS ENGINEERING (PROFESSIONAL ELECTIVE - III)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Solve linear programming problems using graphical and simplex methods.	2	2	-	-	-	-	-	-	-	-	-	1	-	-	-
CO2	Solve non-linear programming problems using search and gradient methods.	2	2	-	-	-	-	-	-	-	-	-	1	-	-	-
CO3	Find the critical path and project cost using PERT & CPM Networks.	2	2	-	-	-	-	-	-	-	-	-	1	1	-	-
CO4	Find the optimal solutions in transportation and assignment problems.	2	2	-	-	-	-	-	-	-	-	-	1	1	-	-
CO5	Calculate optimum Parameters in sequencing, replacement and dynamic programming applications.	1	1	-	-	-	-	-	-	-	-	-	1	-	-	-

	CO Statements	POs												PSOs		
Course Code	**171AG6E08 - INDUSTRIAL ENGINEERING AND MANAGEMENT (PROFESSIONAL ELECTIVE - III)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the role of an industrial engineer and required managerial skill set.	1	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	Select suitable plant layout in the light of industrial safety aspects.	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Develop the efficient work system using principles of work study.	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Analyze control charts for variables and attributes for process control.	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Explain the quantitative methods of human resources management.	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	Find the critical path of estimate project cost using PERT & CPM Network.	1	1	-	-	-	-	-	-	-	-	-	-	1	-	-
Course Code	**171HS6T07 - Employability Skills – IV**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Solve problems of seating arrangements ,syllogism	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO2	Solve problems of Time and Work, Pipes and Cisterns, Time and Distance, Races and trains	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO3	Solve Problems on Boats and Streams, Permutation and Combination, Probability and Data Interpretation	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO4	Apply processes of Group discussion ,Phonetics, Leadership skills in real world	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-
CO5	Apply principles of Group Dynamics, Interview Skills & Evaluation criteria in organizations	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-
Course Code	**171AG6L04 - FARM MACHINERY LAB-1**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the different types of equipment for tillage operations.	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	Measure the specifications and operational parameters of different tillage equipments.	-	1	-	-	3	-	-	-	-	-	-	-	2	-	-
CO3	Select the ploughing method suitable for tillage operations in particular fields.	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO4	Determine soil properties and furrow area indifferent farms before and after tillage Operations.	3	-	-	-	1	-	-	-	-	-	-	-	2	-	-
CO5	Estimate the calibration of seed cum fertilizer drills and sprayers.	1	-	-	2	-	-	-	-	-	-	-	-	2	-	-
Course Code	**171AG6L05 - SOIL AND WATER ENGINEERING LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Determine sediment concentration, rate of sedimentation and infiltration characteristics of soil.	2	1	-	-	1	-	-	-	-	-	-	-	-	2	-
CO2	Estimate soil loss using erosivity index and erodibility index.	1	-	-	-	-	-	-	-	-	-	-	-	-	3	-
CO3	Estimation of runoff water using H-flume and evaporation rate using pan evaporimeter	1	-	1	-	2	-	-	-	-	-	-	1	-	2	-
CO4	Make use of current meter and water meter for measurement of flow.	1	-	1	-	2	-	-	-	-	-	-	1	-	2	-
CO5	Explain about soil conservation and gully control structures.	1	-	3	2	-	-	-	-	-	-	-	1	-	3	-

	CO Statements	POs												PSOs		
VII SEM																
Course Code	**171AG7T18 - MICRO IRRIGATION ENGINEERING**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain scenario, types and different components of sprinkler irrigation system.	-	-	1	-	-	-	-	-	-	-	-	-	-	2	-
CO2	Inspect performance evaluation and design of sprinkler irrigation system.	1	-	3	-	2	-	-	-	-	-	-	1	-	3	-
CO3	Explain scenario and components of drip irrigation system.	-	-	1	-	-	-	-	-	-	-	-	-	-	2	-
CO4	Identify performance evaluation and head losses calculation of drip irrigation.	-	-	3	-	2	-	-	-	-	-	-	-	-	3	-
CO5	Evaluate design of drip irrigation system.	-	-	3	-	2	-	-	-	-	-	-	-	-	3	-
Course Code	**171AG7T19- FARM MACHINERY AND EQUIPMENT-II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Demonstrate different crop harvesting and windrowing methods and machineries.	3	-	-	-	-	-	-	-	-	-	2	-	2	-	-
CO2	Explain working principles and construction details of forage harvesting and threshing machinery.	3	1	-	-	-	-	-	-	-	-	2	-	2	-	-
CO3	Evaluate performance of crop harvesters and threshers	-	2	1	3	1	-	-	-	-	-	-	-	3	-	-
CO4	Explain working principles and construction details of combine harvester, corn harvester and sugarcane harvester.	3	2	-	1	-	-	-	-	-	-	-	1	3	-	-
CO5	Explain working principles and construction details of root crop harvesting equipment.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO6	Demonstrate about different cotton and fruit harvesters.	3	1	-	-	-	-	-	-	-	-	2	-	1	-	-
Course Code	**171AG7T20 - DAIRY AND FOOD ENGINEERING**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain dairy plant layouts and design parameters.	2	2	3	1	-	-	-	-	-	-	-	-	-	-	3
CO2	Identify the preliminary processing steps in dairy industry.	3	1	1	-	-	2	-	-	-	-	-	-	-	-	2
CO3	Compare different thermal treatments of milk.	3	2	2	-	-	2	-	-	-	-	-	-	-	-	2
CO4	Select the accurate processing technique during milk processing.	3	2	1	-	-	2	-	-	-	-	-	-	-	-	3
CO5	Distinguish the changes in milk during preservation.	3	2	2	-	-	2	-	-	-	-	-	-	-	-	2
Course Code	**171ES7T26- MECHANICAL MEASUREMENTS AND INSTRUMENTATION**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the methods of measurement system, instruments and errors in measurements.	2	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	Differentiate various mechanical, electrical and electro-mechanical type pressure measuring transducers.	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Analyze the concepts of strain, force and torque measurements.	2	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO4	Categorize the methods and principles of temperature measuring transducers.	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Differentiate different instruments for measuring sound, speed and motion.	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171AG7E09- SEED PROCESSING AND STORAGE ENGINEERING (PROFESSIONAL ELECTIVE - IV)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Illustrate seed plant layout, and various seed cleaning equipment.	2	1	-	-	-	-	-	-	-	3	2	-	-	-	3

	CO Statements	POs												PSOs		
CO2	Select drying equipment based on different drying techniques.	3	2	1	1	-	-	-	-	-	-	-	-	-	-	2
CO3	Categorize various unit operations in seed processing industry.	3	1	1	1	-	-	-	-	-	-	-	-	-	-	2
CO4	Explain the changes during seed storage and concepts of storage.	2	1	1	-	-	3	-	-	-	-	-	-	-	-	2
CO5	Explain the seed storage structures and their importance.	3	1	1	-	-	-	-	-	-	-	-	-	-	-	3
Course Code	**171AG7E10 - FOOD PROCESSING PLANT DESIGN AND LAYOUT (PROFESSIONAL ELECTIVE - IV)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the parameters to be considered in a food plant layout.	3	1	1	1	-	-	-	-	-	-	-	-	-	-	2
CO2	Compare different food processing plants layouts.	2	1	1	3	-	-	-	-	-	-	-	-	-	-	3
CO3	Design specifications of food processing plant.	2	1	3	-	-	-	-	-	-	-	-	-	-	-	3
CO4	Design the machinery required in process control of the food processing plant.	2	2	3	1	-	-	-	-	-	-	-	-	-	-	3
CO5	Explain sanitation procedures used in the food processing plant and report making.	2	-	-	-	-	2	-	-	-	-	2	3	-	-	3
CO6	Estimate the cost of plant set up and operation.	3	2	-	2	-	-	-	-	-	2	-	-	-	-	3
Course Code	**171AG7E11- FOOD PACKAGING TECHNOLOGY (PROFESSIONAL ELECTIVE - IV)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the importance of packaging in food industry.	3	1	-	-	-	1	2	-	-	-	-	-	-	-	2
CO2	Explain food packaging laws and regulations.	-	-	-	-	-	2	3	2	-	-	-	-	-	-	3
CO3	Categorize paper and glass packaging material for manufacturing process.	3	-	-	-	-	1	1	-	-	-	-	-	-	-	2
CO4	Select metal and plastic packaging material recommended for food packaging.	3	-	-	-	-	1	1	-	-	-	-	-	-	-	2
CO5	Assess knowledge on advanced packaging technologies and testing of packaging material.	3	1	-	2	-	-	1	-	-	-	-	-	-	-	3
Course Code	**171AG7E12 - AQUACULTURAL ENGINEERING (PROFESSIONAL ELECTIVE - V)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Select site for aquaculture pond.	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-
CO2	Analyze soil characteristics that are required for aqua farm construction.	-	1	2	2	-	-	-	-	-	-	-	-	-	1	-
CO3	Design an aqua farm and modern aquaculture farm system with aquaculture equipment.	-	-	3	1	1	-	-	-	-	-	-	-	-	2	-
CO4	Explain the feeding systems for fishes in culture ponds.	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-
CO5	Explain the water treatment techniques in aqua culture ponds.	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-
Course Code	**171AG7E13- SOIL DYNAMICS IN TILLAGE AND TRACTION (PROFESSIONAL ELECTIVE - V)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Distinguish various dynamic properties of soil and their methods of measurement.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO2	Analyze the concept of soil tool interaction.	2	3	-	2	-	-	-	-	-	-	-	-	3	-	-
CO3	Interpret traction mechanics and prediction models.	2	1	-	-	3	-	-	-	-	-	-	2	2	-	-
CO4	Select different traction devices and their method of selection based on load and furrow type.	3	2	-	2	-	-	-	-	-	-	1	-	3	-	-

	CO Statements	POs												PSOs		
CO5	Evaluation of traction device performance.	3	1	-	-	-	-	-	-	-	-	-	2	3	-	-
Course Code	**171AG7E14 - COMPUTATIONAL FLUID DYNAMICS (PROFESSIONAL ELECTIVE - V)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the numerical systems and errors involved in computational fluid dynamics.	2	1	-	-	-	-	-	-	-	-	-	-	-	1	-
CO2	Summarize applied numerical methods, governing equations related to fluid flow and heat transfer.	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Develop several equations involved in the fluid flow modeling.	1	3	2	-	2	-	-	-	-	-	-	-	-	1	-
CO4	Apply FDM concepts for CFD problems.	2	2	-	-	2	-	-	-	-	-	-	-	-	1	-
CO5	Make use of the concepts of finite volume method for computational fluid dynamics problems.	2	2	-	-	2	-	-	-	-	-	-	-	-	1	-
Course Code	**171AG7L06 - FARM MACHINERY LAB – II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Demonstrate working principles of various harvesting and threshing machinery.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO2	Measure harvesting and threshing capacity, efficiency and operational loses of farm machinery.	2	3	2	1	-	-	-	-	-	-	-	-	3	-	-
CO3	Test the harvesters and threshers based on IS standards.	-	2	-	3	-	1	-	-	-	-	-	2	2	-	-
CO4	Select suitable harvesting and threshing method for different crops and fruits.	3	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO5	Explain constructional details of mowers, reapers, various crop combines and threshers.	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO6	Explain safety measures, adjustments, care and maintenance of harvesters and threshers.	3	-	-	-	-	1	-	1	-	-	-	-	3	-	-
Course Code	**171AG7L07 - DAIRY AND FOOD ENGINEERING LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain Milk Properties	3	1	1	1	-	-	-	-	-	-	-	-	-	-	2
CO2	Illustrate heat treatment processes used in milk preservation..	3	1	1	1	-	-	-	-	-	-	-	-	-	-	2
CO3	Determine the energy required to process the freshmilk.	2	3	2	1	-	-	-	-	-	-	-	-	-	-	2
CO4	Demonstrate the working of homogenizer and cream separator.	2	1	3	1	-	-	-	-	-	-	-	-	-	-	3
CO5	Examine the design and layout of dairyplant.	2	1	-	-	-	-	2	-	-	-	3	-	-	-	3
Course Code	**171AG7P01 - INDUSTRY ORIENTED (INTERNSHIP) MINOR PROJECT**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Conduct a technical survey to identify a real world engineering problem	1	1								1		1	1	-	-
CO2	Analyze the industrial plant layout using technical expertise	2					1	1					1	-	2	-
CO3	Compare theoretical and real work environments in technical perspective	2									1	1	1	-	2	-
CO4	Identify the challenges in the execution of operations	1	1	1	1									-	2	-
CO5	Execute the operations and report the results of assigned tasks using modern tools adhering to professional ethics					2			2	1	1			-	-	1

	CO Statements	POs												PSOs		
VIII SEM																
Course Code	**171AG8E15 - HYDRAULIC DEVICES AND CONTROL (PROFESSIONAL ELECTIVE - VI)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the fundamental concepts of hydraulic system.	3	1	-	-	2	-	-	-	-	-	-	-	2	-	-
CO2	Explain basic components in hydraulic system.	3	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO3	Identify various hydraulic control valves and accessories.	3	2	1	-	-	-	-	-	-	-	-	-	3	-	-
CO4	Analyze the hydraulic circuit design.	2	3	2	1	-	-	-	-	-	-	-	-	3	-	-
CO5	Explain the maintenance of hydraulic system.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO6	Classify various hydraulic devices and their application.	2	1	-	-	2	-	-	-	-	-	-	-	2	-	-
Course Code	**171AG8E16- WATERSHED MANAGEMENT (PROFESSIONAL ELECTIVE - VI)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain concept, importance and components of watershed.	-	-	1	-	-	-	-	-	-	-	-	-	-	3	-
CO2	Explain erosion types, soil loss estimation and erosion measurement.	1	1	2	-	-	-	-	-	-	-	-	-	-	3	-
CO3	Estimate runoff and water harvesting structures.	1	1	2	-	-	-	-	-	-	-	-	-	-	3	-
CO4	Explain forest and grass land management.	1	-	2	-	-	1	2	-	-	-	-	-	-	2	-
CO5	Explain importance of ecosystem management.	-	-	-	-	-	2	3	-	-	-	-	-	-	2	-
Course Code	**171AG8E17 - DESIGN OF AGRICULTURAL MACHINERY (PROFESSIONAL ELECTIVE - VI)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the basic concept of machine design.	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO2	Examine basic principles in designing of cotter joint, knuckle joint, levers and springs.	3	1	2	2	-	-	-	-	-	-	-	-	3	-	-
CO3	Apply principles of design to mechanical power transmission elements such as shafts, keys & couplings, bearings.	1	2	3	-	1	-	-	-	-	-	-	-	3	-	-
CO4	Explain the design procedure of flywheel.	2	1	3	-	-	-	-	-	-	-	-	-	2	-	-
CO5	Classify the types of bearing used in machine design.	3	-	-	-	1	-	-	-	-	-	-	-	2	-	-
CO6	Apply principles of design in designing farm machinery implements.	2	2	1	-	3	-	-	-	-	-	-	-	3	-	-
Course Code	**171AG8O01 -DIGITAL CONTROL SYSTEMS (OPEN ELECTIVE)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the advantages of discrete time control systems.	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Use z–transformations in the mathematical analysis of different systems.	2	3	1	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Apply the discrete–time systems in state–space model.	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Analyze the significance stability of the system using different tests.	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Use conventional method of analyzing digital control systems in the w–plane.	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO6	Design the state feedback control by the pole placement method.	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171AG8O02- INDUSTRIAL POLLUTION CONTROL ENGINEERING (OPEN ELECTIVE)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Identify different types of wastes generated in an industry, their effects on living and non-living things.	3	1	-	-	-	-	2	-	-	-	1	-	-	-	-
CO2	Identify the standards for ambient air, noise emission and effluents.	2	2	-	-	-	-	3	-	-	-	1	-	-	-	-

	CO Statements	POs												PSOs		
CO3	Explain about quantification and analysis of waste water treatment.	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Categorize different unit operations and unit processes involved in conversion of highly polluted water to potable standards and solid waste disposal.	2	2	3	-	-	-	-	-	-	-	-	2	-	-	-
CO5	Explain atmospheric dispersion of air pollutants, and operating principles, design calculations of particulate control devices.	2	2	3	-	-	-	-	-	-	-	-	2	-	-	-
Course Code	**171AG8O03 - MECHATRONICS (OPEN ELECTIVE)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Summarize the different types of mechatronics systems and sensors.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Classify the different types of solid state electronic devices.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Describe various types of actuators.	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Choose the appropriate controller or processor.	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Make use of data interfacing and data acquisition in the design of mechatronics systems.	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171AG8O04 - WATER RESOURCES SYSTEMS PLANNING AND MANAGEMENT (OPEN ELECTIVE)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Apply optimization models to solve problems related to water resource systems.	-	2	-	1	2	-	-	-	-	-	3	-	-	-	-
CO2	Make use of linear programming methods to evaluate the feasibility of water resource projects.	1	2	-	-	2	-	-	-	-	-	3	-	-	-	-
CO3	Apply dynamic programming for water resource allocation.	1	2	-	1	2	-	-	-	-	-	-	-	-	-	-
CO4	Demonstrate the nonlinear programming techniques and its different methods.	1	1	-	-	2	-	-	-	-	-	1	-	-	-	-
CO5	Apply the basics of engineering economics and economic analysis in water management, simulation techniques in water resources.	2	1	-	-	2	-	-	-	-	-	3	-	-	-	-
Course Code	**171CS8O04 - OPERATIONS RESEARCH (OPEN ELECTIVE)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Apply mathematical modeling to formulate and solve real-world problems involving decision making as linear programming problem using graphical and simplex methods.	2	2	-	-	-	1	-	-	-	-	-	2	-	-	-
CO2	Find the optimal parameters in transportation problem, assignment problem and replacement problem.	2	-	-	-	-	1	-	-	-	-	-	2	-	-	-
CO3	Find the optimal quantities in inventory control problem and job sequencing problem.	2	-	-	-	-	1	-	-	-	-	-	2	-	-	-
CO4	Apply game theory, queuing theory in decision making problems.	2	2	-	-	-	1	-	-	-	-	-	2	-	-	-
CO5	Apply dynamic programming and simulation techniques in real world problems.	1	1	-	-	-	1	-	-	-	-	-	2	-	-	-

	CO Statements	POs												PSOs		
Course Code	**171AG8O05 - IMAGE PROCESSING TECHNIQUES (OPEN ELECTIVE)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Explain the concepts of digital image processing.	1	-	-	1	2	-	-	-	-	-	-	-	-	-	-
CO2	Identify various image enhancement and image restoration techniques.	1	-	2	1	3	-	-	-	-	-	-	-	-	-	-
CO3	Outline the color fundamentals and different color image processing methods.	1	1	-	1	2	-	-	-	-	-	-	-	-	-	-
CO4	Utilize different morphological operators for image processing.	1	1	-	2	3	-	-	-	-	-	-	-	-	-	-
CO5	Analyze different image segmentation techniques for image processing.	1	2	-	2	3	-	-	-	-	-	-	-	-	-	-
Course Code	**171EC8P02-MAJOR PROJECT**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	
CO1	Develop technical procedure of planning and scheduling of an identified project work through technical survey in line with societal and environmental implications.	1	2	-	-	-	2	2	-	-	-	1	1	1	-	
CO2	Demonstrate technical skills of data collection and data analysis adhering to professional ethics	1	-	-	-	-	-	-	2	-	-	1	1	1	-	
CO3	Design the solutions for the critical problem areas marked in data analysis	2	2	3	2	-	-	-	-	-	-	-	1	1	-	
CO4	Build a team of people to work together and communicate well in the critical stages of project progress.	-	-	-	-	-	-	-	-	1	2	1	1	1	1	
CO5	Use modern tools to derive conclusions and communicating the results of the project work effectively	-	-	-	-	3	-	-	-	-	2	1	1	2	1	