NANDHA ENGINEERING COLLEGE

(AUTONOMOUS)

DEPARTMENT OF AGRICULTURAL ENGINEERING

COURSE ARTICULATION MATRIX WITH COURSE OUTCOME

SEMESTER I														
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C101.1	Construct clear, grammatically correct sentences using a variety of sentence structures and appropriate vocabulary.									3			3		
C101.2	Utilize listening skills to articulate one's own point of view in different circumstances.				3						3	3	3		
C101.3	Apply appropriate communication skills across settings, purposes, and audiences.				3						3	3	3		
C101.4	Distinguish main ideas and supporting details and employ active reading strategies to understand texts at the maximum level.				2						3	3	2		
C101.5	Equip themselves with writing skills needed for academic as well as workplace contexts.				3						2	2	3		
C101 (17EYA01-Professional English – I)					**3**					**3**	**3**	**3**	**3**		

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C102.1	Apply the concept of orthogonal reduction to diagonalize the given matrix.	2	1	3		3		2		3		3	3	1	1
C102.2	Have knowledge about the geometrical aspectsof sphere.	2	3	3		2	3			3		2		1	1
C102.3	Find the radius of curvature, circle of curvature and centre of curvature for a given curve.	3	1	3						3		1		1	2
C102.4	Classify the maxima and minima for a given function with several variables, through by finding stationary points.	3	3	2	3							3		1	
C102.5	Demonstrate the use of double and triple integrals to compute area and volume.	2	3	3	3		3			3		3		1	
C102 (17MYB01-Calculus and Solid Geometry)		**2**	**2**	**3**	**3**	**3**	**3**	**2**		**3**		**2**	**3**	**1**	**1**

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C103.1	Acquire knowledge regarding Acoustics and ultrasonic	3			3										2
C103.2	Apply knowledge in the fields of optics & laser technology	2				3								1	2
C103.3	Design the sensors using the knowledge of fiberoptics				2	2								1	
C103.4	Gain the knowledge of wave, particle natureand matter waves		3		3									1	2
C103.5	Analyze the different kind of crystal structuresand crystal growth	2							3					1	2
C103 (17PYB01- Physics for Engineers)		**2**	**3**		**3**	**3**			**3**					**1**	**2**

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C104.1	Apply knowledge of fundamental principles of chemistry	2	3	3									3	2	3
C104.2	Solve engineering problems, including the utilization of creative and innovative skills	3	3		3	3		3					2	2	3
C104.3	Gain practical experience with chemical process equipment as well as to analyze and interpret data	2	2			2							3	3	2
C104.4	Understand the impact of engineering solutions in a global, economic, environmental, and societal content	3		3			2	3					3	3	2
C104.5	Understand the concept of engineering materials	3				3			2				2	1	
C104 (17CYB01 -Applied Chemistry)		**3**	**3**	**3**	**3**	**3**	**2**	**3**	**2**				**3**	**2**	**3**

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C105.1	Apply the basic laws and investigates the behavior of electric circuits by analytical instruments.	2	3		3		3						3	2	2
C105.2	Identify the electrical components and explore the characteristics of electrical machines.	3	2		3		3						2	2	2
C105.3	Analyze the various characteristics of semiconductor devices and applications.	2	2	2		2	3						3	3	1
C105.4	Expose the concept of digital electronics	3		2		2	3						3	3	
C105.5	Understand the fundamental of communicationsystems.	3		2		3	2						2	1	
C105 (17EEC01 -Basic Electrical and Electronics Engineering)		**3**	**2**	**2**	**3**	**2**	**3**						**3**	**2**	**2**

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C106.1	Identify the appropriate problem solving techniques to drive the solution for the given problem.	3		3							3	3		1	
C106.2	Solve problems using various strategies	3		2							3				
C106.3	Develop programs on Python Programming constructs	3	3	2							3	2		1	1
C106.4	Realize the need of strings, list, and tuples	2	3	2								3			
C106.5	Design programs involving dictionaries andfunction	3	2	3								3			
C106 (17CSC01-Problem Solving and Python Programming)		**3**	**3**	**2**							**3**	**3**		**1**	**1**

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C107.1	Acquire the fundamental knowledge in opticssuch as interference, Diffraction and Understand about the spectral instruments etc	3	2		3			2					3	3	
C107.2	Gain the basic knowledge about handling the laser light and Identify the basic parameters of an optical fibre	3	3		3			2						3	1
C107.3	Analyze the properties of matter with soundwaves	3	3		3										1
C107.4	Apply knowledge of measurement of hardness producing ions, chloride, alkalinity, DO, conductance, EMF and pH	3	3		3			3						1	2
C107.5	Understand the impact of water quality andsolve engineering problems	2	2		3			3						2	2
C107 (17GYP01-Physics and Chemistry Laboratory)		**3**	**3**		**3**			**3**					**3**	**2**	**2**

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C108.1	Use MS Word and MS Excel for document preparation.	3		3							3			1	1
C108.2	Understand the basics of Python Programming constructs	3	3									3		1	
C108.3	Realize the need of string manipulation, list, and tuples	3	3	2						3		2			1
C108.4	Design programs involving dictionaries, function and modules	2	3	3						3		3		1	
C108.5	Develop simple programs with exception handling	3	3			3				3				1	1
C108 (17CSP01- Problem Solving and Python Programming Laboratory)		**3**	**3**	**3**		**3**				**3**	**3**	**3**		**1**	**1**

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C109.1	Communicate using a variety of sentence structures and appropriate vocabulary.									1			1		
C109.2	Comprehend conversations and short talks delivered in English and respond accordingly.				1						3	1	3		
C109.3	Speak appropriately and effectively in various situations.				1						3	1	3		
C109.4	Employ active reading understand texts at the maximum level.				1						3	1	3		
C109.5	Equip themselves with writing formal letters and winning Job Application.				1						3	1	3		
C109 (17EYA02 – Professional English – II)					**1**					**1**	**3**	**1**	**3**		

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C110.1	Predict the suitable method to solve second and higher order differential equations	1	1		2	1	3					2	2	2	1
C110.2	Apply the concepts of Differentiation and Integration to Vectors.	1	1			2	1						2		1
C110.3	Compute an analytic function, when its real or imaginary part is known.	1	1		2				2					2	
C110.4	Identify the Singularities and its corresponding Residues for the given function.	1	1			3	2				1			2	
C110.5	Predict a suitable method to evaluate the Contour integration.	1		2				1					2	2	
C110 (17MYB02-Complex Analysis and Laplace Transforms)		**1**	**1**	**2**	**2**	**2**	**2**	**1**	**2**		**1**	**2**	**2**	**2**	**1**

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C111.1	Design a system, component, or process to meetdesired needs.		3	2								3		3	3
C111.2	Identify, formulate, and solve environmental engineering problems				3					3				3	2
C111.3	Understand the professional and ethical responsibility as related to the practice of environmental engineering and the impact of engineering solutions in a global context.	3				3	3	2	3					3	2
C111.4	Use the techniques, skills, and modern engineering tools necessary for environmental engineering practice.	3				2	2							3	
C111.5	Acquire the knowledge of information technology in environmental science.	3		3				3		3			3	2	
C111 (17CYB03-Environmental Science)		**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**		**3**	**3**	**3**	**2**

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C112.1	Examine agricultural production practices		2	3		3		3		2		1	2	3	
C112.2	Plan various field preparation techniques for crops			3		3		2				2	2	3	
C112.3	Classify various weeds, pest & diseases, nutrient management for crops		3	3		3		1		1		2	2	3	
C112.4	Recommend various agricultural crop production practices		2	3		2			1			1	2	3	
C112.5	Recommend various horticultural crop production practices		2	3		2			1			1	2	3	
C112 (17AGC01 - Principles and Practices of Crop Production)			2	3		3		3		2		1	2	3	

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C113.1	Construct conic sections and special curves of required specifications	2		3	2	2				3		2	3		3
C113.2	Apply the concept of first angle projection to create project of straight lines, planes, solids and section of solids	2		2	1					3		3	2		2
C113.3	Develop a surface drawing of a solid model with given dimensions	3		3	3	3				3		2	2	3	3
C113.4	Build orthographic, isometric projections of a three dimensional object	3		3	3					2		3	3	2	
C113.5	Make use of the knowledge of engineering drawing to create physical models	1		2	2					2		3	3	3	2
C113 (17MEC01 – Engineering Graphics)		**2**		**3**	**2**	**3**				**3**		**3**	**3**	**3**	**3**

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C114.1	Solve the engineering problems on stableparticles using conditions for equilibrium	2	3										3		3
C114.2	Calculate the reaction forces of various supports and resultant forces on rigid bodies	2	3	2	1								3		3
C114.3	Solve the problems involving dry friction under equilibrium conditions	3	3	2	2		1			2		3	3		3
C114.4	Determine the centroid, centre of gravity and moment of inertia of various surfaces and solids.	3	3	2	2					2		3	3		3
C114.5	Solve the problems involving dynamics of particles and rigid bodies		3	2	2	2				2		2	3		3
C114 (17MEC02 – Engineering Mechanics)		**3**	**3**	**2**	**2**	**2**	**1**			**2**		**3**	**3**		**3**

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C115.1	Work on different agronomic practices		2	3	3	2		2				1	2	1	
C115.2	Prepare nursery for different crops	2		3		3		2				2	2	2	
C115.3	Imply management concepts on crop	2	3	3	2	3		1				2	2	3	
C115.4	Suggest suitable harvesting techniques	2	2	3	1	2						1	2	1	2
C115.5	Minimize post harvest losses	2	2	3	1	2						1	2		3
C115 (17AGP01- Crop Production And Husbandry Laboratory)		**2**	**2**	**3**	**2**	**2**		**2**				**1**	**2**	**2**	**3**

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C116.1	Understand various civil engineering practices like plumbing, carpentry and relevant tools	3			3		2			3		2	3	2	
C116.2	Understand various manufacturing processes like welding, machining and sheet metal work	3			2		3			3		3	2		1
C116.3	Make residential house wiring and Measure energy and resistance to earth of an electrical equipment	2				3	3		2					1	2
C116.4	Perform the assembling and testing of the PCB based electronic circuits.	3									2	3	3	2	3
C116.5	Make / operate / utilize the simple engineering components					3					3			2	
C116 (17GYP02 – Engineering Practices Laboratory)		**3**			**3**	**3**	**3**		**2**	**3**	**3**	**3**	**3**	**2**	**2**

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C201.1	Ability to have fundamental understanding of Fourier series and give Fourier expansions of a given function.	2	3	1	3							2	3		2
C201.2	Apply transform techniques to solve engineering problems.	2	3	3			3	3							3
C201.3	Analyze and simulate the first and second order linear partial differential equations.	3	3	2						3		3	1	3	3
C201.4	Demonstrate a firm understanding of the solution techniques for homogeneous linear PDE's.	3	3	2	3	3							3		3
C201.5	Ability to apply partial differential techniques to solve the physical engineering problems.	3	2	3	2							1		3	2
C201 (17MYB03- Fourier Series And Partial Differential Equation)		**3**	**3**	**2**	**3**	**3**	**3**	**3**		**3**		**2**	**2**	**3**	**3**

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C202.1	Classify different soil and process of soil formation	3			2			2	2				2	2	
C202.2	Express the relationship of different phases ofsoil	3			1			2	2				1	1	
C202.3	Impart knowledge of physical properties of soil	3			1			1	1				1	1	
C202.4	Suggest suitable crop	3	1	2	2			2	1				3	3	
C202.5	Suggest nutrient content and determine soil deficiency	3	1	2	2			2	2				3	3	
C202 (17AGC02 -Soil Science And Engineering)		**3**	**1**	**2**	**2**			**2**	**2**				**2**	**2**	

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C203.1	Involved in design of pipes and channels	3	2	2										3	
C203.2	Apply conceptual knowledge in selection of pipesfor water flow	3	2	2	3		2							2	
C203.3	Apply knowledge in construction of channels	3	2	2		2								2	
C203.4	Apply knowledge in design of drip and sprinkler irrigation system	3	3	3	2	2	3							2	
C203.5	Determine the quantity of water required, water loss etc.	3	2	2	2	2	3							3	
C203 17AGC03-Fluid Mechanics and Hydraulics		**3**	**2**	**2**	**2**	**2**	**3**							**2**	

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C204.1	Identify the instruments required for conducting the survey in level and sloping ground	3	3	2	2					2	2				
C204.2	Calculate area and volume of earth work needed in construction of farm structures	3	3	3	3					3	1		3	2	2
C204.3	Identify the angle between the stations by prismatic compass and conduct the plane table surveying for locating the new station	3	3		3	2				3			3		
C204.4	Conduct leveling and contouring in plains and hilly regions for efficient irrigation	3	3	3	3	3				3	2		2	2	2
C204.5	Conduct survey of a given field using Total station	3	3	3	3	3	3			3	2		2	2	2
C204 17AGC04- Surveying And Levelling		**3**	**3**	**3**	**3**	**3**	**3**			**3**	**2**		**3**	**2**	**2**

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C205.1	Design suitable farm implements, material handling equipments	3	2	2	2	2	1	1					1	2	
C205.2	Apply in tractors and power tillers	3	1				1	1	1	1				2	
C205.3	Know the mechanism of gear and gear trains	3		1				1						2	
C205.4	Understand the working of cam and flywheel	3	1	1										2	
C205.5	Gain knowledge on governors	3		1		1	2							2	
C205 17AGC05 -Mechanics Of Farm Machines		**3**	**1**	**1**	**2**	**2**	**1**	**1**	**1**	**1**			**1**	**2**	

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C206.1	Exemplify the basic concepts and zeroth law of thermodynamics.	3	3			2		2					3	3	
C206.2	Determine the thermodynamic properties of pure substances and its phase change processes	3	3					2					2		3
C206.3	Apply the first law of thermodynamics to closed and steady flow process	3	3	3		2		2	2				2		
C206.4	Solve the problems related to cycles and cyclic devices using second law of thermodynamics	3	3	3		2		3	2	1		1	1	3	3
C206.5	Evaluate various chemical reactions,combustion processes and chemical equilibrium	3	3	1				2		1		1	3	2	
C206 17AGC06-Thermodynamics for Agricultural Engineers		**3**	**3**	**2**		**2**		**2**	**2**	**1**		**1**	**2**	**3**	**3**

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COURSE ARTICULATION MATRIX WITH COURSE OUTCOME

SEMESTER III															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C207.1	Acquaint with different surveying methods	2		2	2										
C207.2	Select suitable method of survey to the given filed	2	2	3	2	2									
C207.3	Determine the contours	2	2	3	3	3									
C207.4	Calculate area and volume of earth work needed in construction of farm structures	2	2	3	3	3								1	
C207.5	Conduct leveling and contouring in plains and hilly regions	2	2	3	2	3								1	
C207 17AGP02 -Surveying And Levelling Laboratory		**2**	**2**	**3**	**2**	**3**								**1**	

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SEMESTER III															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C208.1	Design of pipes and channels	2	2	2		2	1	1	1	1					
C208.2	Apply conceptual knowledge in selection of pipes for water flow	2	1	1		1	1	1						1	
C208.3	Imply in constructional knowledge of channels	2	1	1		2	1	1						1	
C208.4	Apply in design of drip and sprinkler irrigationsystem	3		2		1	2	1	1					2	
C208.5	Determine the quantity of water required, waterloss etc.	2	2	1	1									2	
C208 **17AGP03- Fluid Mechanics And Hydraulics Laboratory**		**2**	**2**	**1**	**1**	**2**	**1**	**1**	**1**	**1**				**2**	

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SEMESTER IV															
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C209.1	Understand the common statistical techniques.	3	3		2	2		3					2		
C209.2	Apply Analysis of Variance for the data set of selected number factors for analyzing the significance	3	3		2	2						1	2		
C209.3	Apply the suitable numerical techniques to solve practical engineering problems.	3	3		2	2		3				1	2		
C209.4	Demonstrate the concept of interpolation and numerical integration when dealing withempirical data sets.	3	3		2	2							2		
C209.5	Make use of numerical methods in the solution of ordinary differential equations which are useful in solving engineering problems	3	3		2	2		3				1	2		
C209 17MYB06 -Statistics And Numerical Methods		**3**	**3**		**2**	**2**		**3**				**1**	**2**		

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SEMESTER IV															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C210.1	Impart concept on conduction mode of heat transfer in concentration and drying of food materials	3	3	2	1										2
C210.2	Impart concept on convection mode of heat transfer in concentration and drying of food materials	3	3	1	2	2									2
C210.3	Impart concept on radiation mode of heat transfer in concentration and drying of food materials	3	3	2		2							1		2
C210.4	Design heat exchanger for effective heat utilization	2	3	3	2					3			2	3	3
C210.5	Apply knowledge in mass transfer mechanism	3	3	1	2	2								2	3
C210 17AGC07- Heat And Mass Transfer For Agricultural Engineers		**3**	**3**	**2**	**2**	**2**				**3**			**2**	**3**	**2**

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COURSE ARTICULATION MATRIX WITH COURSE OUTCOME

SEMESTER IV															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C211.1	Predict moisture content of crop and use threshing techniques to minimize post-harvest losses.	3	1										1		2
C211.2	Design material handling equipment, storage structures and dryers for different type of crops	3	2		1	1				1		1	2		3
C211.3	Recommend cleaners, graders and conveying equipment.	3	2	2	2	1				1		1	1	2	3
C211.4	Design drying and storage structure to minimize post-harvest losses	3	3	3	2					1		1	1	2	3
C211.5	Use various technique to minimize post-harvest losses during milling	3	2	2	2	2				1		1	1	2	3
C211 17AGC08 -Crop Process Engineering		**3**	**2**	**2**	**2**	**1**				**1**		**1**	**1**	**2**	**3**

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SEMESTER IV														
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C212.1	Categorize and suggest different tractors and their functions.	3	3			3								2	
C212.2	Calculate valve timing and represent by a diagram and rectify problems in the tractors.	3	3			2								2	
C212.3	Impart knowledge on effective transmission of power and braking system	3	3			3								2	
C212.4	Apply knowledge on hydraulic system in atractor and estimate the traction.	3	3	2	2	3								2	
C212.5	Test and assess the performance of tractors and power tillers	3	3	3	3	3	1		1			2	1	2	
C212 17AGC09 -Farm Tractor Systems		**3**	**3**	**3**	**3**	**3**	**1**		**1**			**2**	**1**	**2**	

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SEMESTER IV															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C213.1	Determine the loss of water and hydrologic cycle.	3	2		2	2		3					3	3	
C213.2	Measure increase infiltration rate, groundwater level and minimize runoff	3	3	2	3	3		3		3		3	2	2	
C213.3	Analyze water levels and flood.	3	3		3	2		3					3	3	
C213.4	Apply concept to increase groundwater level and effective utilization	3	2	2	2	2		3					3	3	
C213.5	Locate and effectively utilize the groundwater	3	2	2	2	2		3		3		2	2	2	
C213 17AGC10 -Hydrology And Water Resources Engineering		**3**	**2**	**2**	**2**	**2**		**3**		**3**		**3**	**3**	**3**	

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SEMESTER IV															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C214.1	Apply the concepts of mechanics of deformable solids in different applications	3	3		2								2	2	3
C214.2	Imply concept of stress and strain in designing farm structures	3	3	2	1		1	1					2	3	3
C214.3	Solve solid mechanics related engineering problems in systematic methods	3	3	1	1								2	2	3
C214.4	Construct storage godowns and farm structures	3	3	2	2	1	1	1	1	1			2	2	2
C214.5	Construct farm structures	3	3	1	2	1	1	1	1	1			2	1	2
C214 17AGC11 -Mechanics of Materials		**3**	**3**	**2**	**2**	**1**	**1**	**1**	**1**	**1**			**2**	**2**	**3**

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SEMESTER IV															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C215.1	Minimize post harvest loss during storage, milling	2	1			2	2			1				2	3
C215.2	Design various post harvest equipments	3	2	2		1				2				2	3
C215.3	Design cleaners and graders	3	2	2			2							2	3
C215.4	Design different conveying equipment	3	2	2		2	2			1				2	3
C215.5	Design or alter the existing methods to minimize post harvest loss	3	2	2		1	3							3	3
C215 **17AGP04- Crop Process Engineering Laboratory**		**3**	**2**	**2**		**2**	**2**			**1**				**2**	**3**

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SEMESTER IV															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C216.1	Suggest suitable tractor for different field	3		1		2	1		2				2	2	
C216.2	Apply knowledge for effective utilization of power	3		1		1	1		2					2	
C216.3	Utilize effective power transmission.	3		1		1	1		2					2	
C216.4	Avoid accidents at farm level	3		1		1	1		2					2	
C216.5	Test tractors and power tillers	3		1		1	1		2					2	
C216 **17AGP05 -Farm Tractors And Engines Laboratory**		**3**		**1**		**1**	**1**		**2**				**2**	**2**	

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SEMESTER V														
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C301.1	Select and design suitable evaporators for different agricultural processing	3	3	3	3	2	3		2			3	2	2	3
C301.2	Select suitable mechanical separators for different agricultural processing	3	3	2	1	1	3		2			1	2	1	3
C301.3	Calculate, select and design suitable size reduction machineries for various agricultural processing operations	3	3	3	2	2	3					3	2		3
C301.4	Apply crystallization and distillation process in agricultural processing	3	3	1	1	2	2		2			3		2	3
C301.5	Apply membrane separation process in foodprocessing	3	3	1	1		2		2			1			3
C301 17AGC12 -Unit Operations In Agricultural Processing		**3**	**3**	**2**	**2**	**2**	**3**		**2**			**2**	**2**	**2**	**3**

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SEMESTER V														
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C302.1	Effectively utilize the implements for better production	3			2	3						3	2	1	1
C302.2	Select and calculate the forces involved in primary tillage implements	3			2	3						3	2	3	1
C302.3	Select and adjust the various secondary tillage implements	3		1	2	3						3	2	3	1
C302.4	Select and test the sowing equipment	3		2	2	3						3	2	3	1
C302.5	Select suitable fertilizer applicators	3	3	2	2	3						3	2	2	1
C302 17AGC13 -Farm Implement And Equipment		**3**	**3**	**2**	**2**	**3**						**3**	**2**	**2**	**1**

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SEMESTER V															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C303.1	Describe the soil-water relationship	3	2	3	2	3			2			1		2	
C303.2	Calculate the irrigation water requirement	3	2	3	2	3			2			1	2	3	1
C303.3	Select suitable irrigation methods for effective utilization of water resources	3	2		1	3			2			2	2	2	2
C303.4	Implement new techniques for command area development	3	1		1	1	3					3		2	2
C303.5	Design suitable drainage system for effective crop production	3	1	3	2	3			2			2	2	3	2
C303 **17AGC14 -Irrigation And Drainage Engineering**		**3**	**2**	**3**	**2**	**3**	**3**		**2**			**2**	**2**	**2**	**2**

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SEMESTER V															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C304.1	Suggest suitable biomass conversion methods	3	2	2	2		2	3					2		2
C304.2	Suggest effective utilize the biochemical conversion	3	3	3	3		3	3		1		2	3	3	2
C304.3	Effectively convert biomass for energy generation	3	3	3	3		3			1		2	3	3	3
C304.4	Utilize the biomass for production for various end products	3	3	3	3		3	3		2		2	3	3	3
C304.5	Suggest suitable methods for effective utilization of heat energy	3	3	3	3	1	3	3		2		2	3	2	3
C304 **17AGC15 -Bio And Thermo-Chemical Conversion Of Biomass**		**3**	**3**	**3**	**3**	**1**	**3**	**3**		**2**		**2**	**3**	**3**	**3**

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SEMESTER V															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C305.1	Describe the concept of agricultural business						2		3			3	2		
C305.2	Assess the management technique in agri-business		2		2	2	1		3		2	2	3		
C305.3	Plan and estimate agricultural product marketing		2	2	2	2	2		3		2	3	3		
C305.4	Plan agri-business project		2	2	2	2	2		3			3	3		
C305.5	Apply the skills for effective marketing by utilization of human resources		1	2	2	3	2		3		2	3	3		
C305 17AGX02- Agricultural Business Management			**2**	**2**	**2**	**2**	**2**		**3**		**2**	**3**	**3**		

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SEMESTER V															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C306.1	Apply universal soil loss equation to estimate the soil erosion process.	3	3					3					3	2	
C306.2	Adopt the techniques bunds and terraces to control erosion	3	3	2		2		3					3	2	
C306.3	Adopt the techniques wind breaks and shelterbreaks to control gully erosion	3	2	2		3		3						3	
C306.4	Know planning and development watershed	3	1	3			3	3	2	3	2	3		3	1
C306.5	Adopt the water harvesting techniques like farm pond and percolation pond	3	1	2		2	3	3					2	3	1
C306 **17AGX12 -Soil And Water Conservation Engineering**		**3**	**2**	**2**		**2**	**3**	**3**	**2**	**3**	**2**	**3**	**3**	**3**	**1**

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SEMESTER V															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C307.1	Calculate and design various separators involved in agricultural processing operations	3	1	2											3
C307.2	Calculate energy requirement and select suitable size reduction equipment	3	2	2											3
C307.3	Determine the mixing index	3	2	2											3
C307.4	Select and design suitable evaporators for concentration of heat sensitive materials	3	2	2											3
C307.5	Design and minimize loss in agricultural processing units	3	1	1	2				2	2	2	2			3
C307 17AGP06 -Unit Operations In Agricultural Processing Laboratory		**3**	**2**	**2**	**2**				**2**	**2**	**2**	**2**			**3**

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SEMESTER V															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C308.1	Effectively utilize the water resources	2	2				1	1				3	2	2	
C308.2	Determine moisture content	2		2		3			2			2	1	2	
C308.3	Minimize water loss	2	2	2	1	2						1		3	1
C308.4	Select and design suitable irrigation system	1					2		2			2	1	3	1
C308.5	Design micro irrigation system for effective utilization of available water resources	1		2	1	2	2		2			2	1	3	1
C308 **17AGP07 -Irrigation And Drainage Engineering Laboratory**		**2**	**2**	**2**	**1**	**2**	**2**	**1**	**2**			**2**	**1**	**3**	**1**

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SEMESTER VI															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C309.1	Select and design interculture equipment	3		3		3								3	
C309.2	Calculate the particle size and area covered by different sprayers	3	2	2	3	3	2	3	1					3	
C309.3	Maintain the duster for effective utilization	3		1	2		2	3						3	
C309.4	Select suitable harvesting equipment	3	2	3	2	3	2		2				2		3
C309.5	Use fruit pluckers, tree shakers, post hole diggers and chaff cutter	3	2	3	2	3	3	1	2				2		3
C309 **17AGC16 -Plant Protection And Harvesting Machinery**		**3**	**2**	**2**	**2**	**3**	**2**	**2**	**2**				**2**	**3**	**3**

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SEMESTER VI														
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C310.1	Categorize the different types of pumps and water lifting devices	2	2	2	2	2	1	1					2	3	
C310.2	Differentiate, select and maintain pump valves	3	3		1	2	2	1					2	3	
C310.3	Imply modern irrigation concepts	3	2	3	2	1	2	2					1	3	
C310.4	Design drip irrigation system	2	2	3	3	2	1	1		1			1	3	
C310.5	Design sprinkler irrigation system	2	2	3	2	1	1	2		1			1	3	
C310 17AGC18 -Design Of Micro Irrigation System		**2**	**2**	**3**	**2**	**2**	**1**	**1**		**1**			**1**	**3**	

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SEMESTER VI															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C311.1	Control the losses of food grains	3		3		1	1			2		3	2	2	1
C311.2	Select suitable storage methods to minimizeloss	3		3		3	2			3			1		2
C311.3	Suggest suitable packaging materials for different kinds of food	3		3		2	2	3		3		2		1	1
C311.4	Test the properties of packaging materials	3		3		3	2	3		3		2	2	2	1
C311.5	Assess the packaging techniques for different kinds of food	3		3		3	2	3				2	3	2	1
C311 **17AGX06 – Packaging And Storage Techniques For Agricultural Commodities**		**3**		**3**		**2**	**2**	**3**		**3**		**2**	**2**	**2**	**1**

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COURSE ARTICULATION MATRIX WITH COURSE OUTCOME

SEMESTER VI															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C312.1	Classify seed based on seed characters	2				3			2				1		
C312.2	Apply techniques for seed production and certify seed	2		2		3						2	2	3	1
C312.3	Apply techniques for seed processing	2		3		3			1			3	2	1	3
C312.4	Plan programmes for seed development	1		2					2			3	3		1
C312.5	Produce seeds in specific crops	2		1		3						2	2	3	1
C312 **17AGX07 -Seed Technology Applications**		**2**		**2**		**3**			**2**			**3**	**2**	**2**	**2**

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SEMESTER VI															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C313.1	Apply the land use pattern in watershed	3		3		2		1	1			2	1		3
C313.2	Estimate watershed planning	3	1	2	1	2			2	1			2		2
C313.3	Apply water conservation practices in irrigated lands and dry lands	3	1	3	1	2		1		2		1	3		3
C313.4	Implement the water harvesting techniques for effective ground water recharge	3		2		2							2		2
C313.5	Adopt suitable techniques in watersheddevelopment	3		3		2							3		3
C313 17AGX08 -Watershed Management		**3**	**1**	**3**	**1**	**2**		**1**	**2**	**2**		**2**	**2**		**3**

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SEMESTER VI															
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C314.1	Explain refrigeration cycle	3	2	1		1		2	1				1		2
C314.2	Detect problems in refrigerator	3		1		2		2				2		1	1
C314.3	Select suitable refrigerant for effective refrigeration without environmental pollution	2		2		1	2	3	2				1		2
C314.4	Apply air conditioning according to weather	2					2	3							1
C314.5	Design refrigerator vehicle and cold storage	3	2	3	2	2	3	2		1			2	2	3
C314 17AGX05 -Refrigeration And Air Conditioning For Agricultural Engineers		**3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**		**2**	**1**	**2**	**2**

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SEMESTER VI															
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C315.1	Describe the classification of constructionmaterials	3		3		3		1	1	2		2	1	2	2
C315.2	Design Lintels and Arches in farm structures.	3		3		2		1	1			2	2		2
C315.3	Determine the flooring type required for aselected farm structure.	3		3		2		2	2			2	2		2
C315.4	Apply safety standards in selecting location ofdoors and windows in farm structures.	3		2		2		2	2			1	1		2
C315.5	Design all types of farm structures	3		2		2							1	2	2
C315 17AGX14 -BUILDING MATERIALS AND FARM STRUCTURES		**3**		**3**		**2**		**2**	**2**	**2**		**2**	**1**	**2**	**2**

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SEMESTER VI															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C316.1	Draw orthographic views	2		3	2	3	1							3	
C316.2	Draw two dimensional and three dimensional views of machine components	2		3	2	3	1						3	3	
C316.3	Design machine components	2		3	2	3	1						3	3	
C316.4	Create three dimensional assembly model	2		3	2	3	1						3	3	
C316.5	Effectively utilize the software skills	2		3	2	3	1						1	3	
C316 17AGP08 -CAD For Agricultural Engineering		**2**		**3**	**2**	**3**	**1**						**3**	**3**	

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SEMESTER VI															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C317.1	Design farmstead, machine shed and workshop	3		3	3									3	
C317.2	Design dairy and poultry house	3		3	3									3	
C317.3	Design ventilation system for dairy and poultry house	3		3	3									3	2
C317.4	Design different storage structure for foods and silage	3		3	2									3	3
C317.5	Design fencing and sanitary structure	3		3	2									3	
C317 17AGP09 -Drawing Of Farm Structures		**3**		**3**	**3**									**3**	**3**

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SEMESTER VII														
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C401.1	Differentiate protected cultivation methods and imply in crop production	2	2	3	3	3	2	2		2		2	2	3	1
C401.2	Apply hi-tech techniques for effective production for vegetable crops	2	1		1	3	2	2				2	1	3	
C401.3	Apply hi-tech techniques for effective production for flower crops	2	1		1	3	2	2				2	1	3	
C401.4	Apply precision farming techniques for effective production	3	3	3	3	3	2	2		2		2	3	3	1
C401.5	Assesses the technology for horticulture crops	2	1		1	3	2	2				2	1	1	
C401 17AGC17 -Protected Cultivation		2	2	3	2	3	2	2		2		2	2	3	1

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SEMESTER VII														
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C402.1	Explain the different food concentration methods	3					2								2
C402.2	Apply thermal processing technique to improve shelf life of foods	3	2	1	3	2	3						3	1	3
C402.3	Apply suitable drying and dehydration methods to minimize food loss	3	3	2	2	1	2							2	3
C402.4	Assess the suitable preservation technique for milk	3	3	2	3	2	3						3	2	3
C402.5	Test milk and produce value added productsfrom milk	3				3	3							1	2
C402 17AGC19 -Food And Dairy Engineering		**3**	**3**	**2**	**3**	**2**	**3**						**3**	**2**	**3**

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SEMESTER VII														
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C403.1	Manage the constrains involved in field machinery system	3	3	3					3	3	3			2	
C403.2	Analyze the performance of tractor	3	3	3	3	2			3	2			2	3	2
C403.3	Analyze the performance of power tiller	3	3	3	3	3			1				2	2	3
C403.4	Test and evaluate tillage and sowing equipment	3	3	3	3	3			1				2		
C403.5	Test and evaluate plant protection and harvesting machinery	3	3	3	3	3			1				2	2	
C403 17AGC20- Testing And Management Of Farm Machinery		**3**	**3**	**3**	**3**	**3**			**2**	**3**	**3**		**2**	**2**	**3**

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SEMESTER VII														
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C404.1	Describe the basics of remote sensing	3					2	3		3				2	2
C404.2	Explain the role of remote sensing satellite andsensors	3					3	2		3			3	2	2
C404.3	Discuss the concepts of GIS and coordinate system	3				3				3				2	
C404.4	Interpret the spatial images of vegetation, soil,water	3	2	1	2	3				3			3	2	1
C404.5	Explain the application of GIS in different sectors	3	3	3	3	3	3	3		3			3	1	
C404 17AGC21- Remote Sensing And GIS For Agricultural Engineers		**3**	**3**	**2**	**3**	**3**	**3**	**3**		**3**			**3**	**2**	**2**

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SEMESTER VII															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C405.1	Detect the type and concentration ofmicrobial load	3	3	3		2	3			3	3				
C405.2	Select and design suitable dryersforagricultural produce	3	3	3		2	3			3	3			2	
C405.3	Produce value added products of fruits	3	3	3		2	3			3	3			2	
C405.4	Assess the suitable preservation technique for milk	3	3	3		2	3			3	3				
C405.5	Test milk and produce value added productsfrom milk	3	3	3		2	3			3	3			2	
C405 17AGP10 -Food And Dairy Engineering Laboratory		**3**	**3**	**3**		**2**	**3**			**3**	**3**			**2**	

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SEMESTER VII															
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C406.1	Identify the major tractor system	3	1	1	2		3	2	2	2	2		2	3	3
C406.2	Hitch and operate farm implements with the tractor	3	3	2	2		3	1	1	2			2	3	2
C406.3	Implement various maintenance techniques for various farm implements and equipment	3	2	2	2		3	1	1	2			2	3	3
C406.4	Operate, adjust seed drill with tractor	3	3	2	2		3	1	1	2			2	2	3
C406.5	Take remedial action for maintenance for tractor	3	1	2	3		3	2	1	2	2		2	3	3
C406 17AGP11- Operation And Maintenance Of Farm Machinery Laboratory		**3**	**2**	**2**	**2**		**3**	**1**	**1**	**2**	**2**		**2**	**3**	**3**

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SEMESTER VII															
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C407.1	Better experience in practical knowledge at farmlevel.				3				3		3	3	3	3	
C407.2	Implement and rectify the problems of implements/ equipments at field level.				3				3		3	3	3	3	
C407 17AGP12– Industrial Training (4 weeks)					**3**				**3**		**3**	**3**	**3**	**3**	

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SEMESTER VII														
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C408.1	Study problems in the field of agriculture engineering through literature survey and its reviews.	3				2			3	3		1	3		2
C408.2	Undertake problem identification, formulation and solution	3	3		2	2	3	3	2	3		3	2	2	1
C408.3	Design engineering solutions to complex problems utilising a systems approach and develop projects	3	3	3	3	2	3	3	3	3		3	2	3	3
C408.4	Communicate effectively and to present ideasclearly	3				2			2	3	3	1	1		
C408.5	Demonstrate the knowledge, skills and work as a team to achieve common goal	3				2	3	3	1	3	3	3	3		2
C408 17AGD01 – Project Work-I		**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**3**	**2**

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COURSE ARTICULATION MATRIX WITH COURSE OUTCOME

SEMESTER VIII														
CO/PO	**STATEMENT**	**P01**	**P02**	**P03**	**P04**	**P05**	**P06**	**P07**	**P08**	**P09**	**P10**	**PO11**	**PO12**	**PSO1**	**PSO2**
C409.1	Study problems in the field of Agriculture Engineering through literature survey and its reviews.	3				2			3	3		1	3		2
C409.2	Undertake problem identification, formulation and solution.	3	3		2	2	3	3	2	3		3	2	2	1
C409.3	Design engineering solutions to complex problems utilising a systems approach and develop projects	3	3	3	3	2	3	3	3	3		3	2	3	3
C409.4	Communicate effectively and to present ideasclearly	3				2			2	3	3	1	1		
C409.5	Demonstrate the knowledge, skills and work as a team to achieve common goal	3				2	3	3	1	3	3	3	3		2
C410 17AGD02 – Project Work-II		**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**3**	**2**