NEHRU COLLEGE OF ENGINEERING AND RESEARCH CENTRE

(Accredited by NAAC, Approved by AICTE New Delhi, Affiliated to APJKTU)

Pampady, Thiruvilwamala (PO), Thrissur (DT), Kerala 680 588

DEPARTMENT OF MECHATRONICS

COURSE OUTCOMES AND MAPPING

2015 REGULATION APJKTU SYLLABUS

VISION OF THE INSTITUTION
To mould true citizens who are millennium leaders and catalysts of change through excellence in education.
MISSION OF THE INSTITUTION
NCERC is committed to transform itself into a center of excellence in Learning and Research in Engineering and Frontier Technology and to impart quality education to mould technically competent citizens with moral integrity, social commitment and ethical values. We intend to facilitate our students to assimilate the latest technological know-how and to imbibe discipline, culture and spiritually, and to mould them in to technological giants, dedicated research scientists and intellectual leaders of the country who can spread the beams of light and happiness among the poor and the underprivileged.

ABOUT DEPARTMENT

- Established in: 2013
- Course offered: B.Tech Mechatronics Engineering
- Approved by AICTE New Delhi and Accredited by NAAC
- Affiliated to the University of Dr. A P J Abdul Kalam Technological University.

DEPARTMENT VISION

To develop professionally ethical and socially responsible Mechatronics engineers to serve the humanity through quality professional education.

DEPARTMENT MISSION

1) The department is committed to impart the right blend of knowledge and quality education to create professionally ethical and socially responsible graduates.

2) The department is committed to impart the awareness to meet the current challenges in technology.

3) Establish state-of-the-art laboratories to promote practical knowledge of mechatronics to meet the needs of the society

PROGRAMME EDUCATIONAL OBJECTIVES

I. Graduates shall have the ability to work in multidisciplinary environment with good professional and commitment.

II. Graduates shall have the ability to solve the complex engineering problems by applying electrical, mechanical, electronics and computer knowledge and engage in lifelong learning in their profession.

III. Graduates shall have the ability to lead and contribute in a team with entrepreneur skills, professional, social and ethical responsibilities.

IV. Graduates shall have ability to acquire scientific and engineering fundamentals necessary for higher studies and research.

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PROGRAM OUTCOME (PO'S)

Engineering Graduates will be able to:

PO 1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO 2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOME(PSO'S)

PSO 1: Design and develop Mechatronics systems to solve the complex engineering problem by integrating electronics, mechanical and control systems.

PSO 2: Apply the engineering knowledge to conduct investigations of complex engineering problem related to instrumentation, control, automation, robotics and provide solutions.

FIRST YEAR- SEMESTER 1 & 2		
SUBJECT CODE	**MAPPING CODE**	**SUBJECT NAME**
MA 101	C 101	Calculus
PH 100	C 102	Engineering Physics
CY 100	C 103	Engineering Chemistry
BE 100	C 104	Engineering Mechanics
BE 110	C 105	Engineering Graphics
BE 101-02	C 106	Introduction to Mechanical Engineering Sciences
BE 103	C 107	Introduction to Sustainable Engineering
CE 100	C 108	Basics of Civil Engineering
EE 100	C 109	Basics of Electrical Engineering
EC 100	C 110	Basics of Electronics Engineering
MA 102	C 111	Differential Equations
BE 102	C 112	Design and Engineering
PH 110	C 113	Engineering Physics Lab
CY 110	C 114	Engineering Chemistry Lab
CE 110	C 115	Civil Engineering Workshop
ME 110	C 116	Mechanical Engineering Workshop
EE 110	C 117	Electrical Engineering Workshop
EC 110	C 118	Electronics Engineering Workshop

Course Code & Name: MA 101 CALCULUS

SUBJECT CODE: C101	
COURSE OUTCOMES	
C101.1	Solve the convergent test in mathematical series
C101.2	Acquire the basic knowledge about three dimensional spaces and integral calculus of functions of more than one variables
C101.3	Understand about partial derivatives and its applications
C101.4	Solve problems in calculus of vector valued functions
C101.5	Apply multiple integrals to find area and volume
C101.6	Evaluate surface and volume integrals

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C101.1	3	3	3	3	-	-	-	-	-	-	-	1	1	3
C101.2	3	3	3	3	-	-	-	-	-	-	-	1	2	3
C101.3	3	3	3	3	-	-	-	-	-	-	-	1	2	3
C101.4	3	3	3	3	-	-	-	-	-	-	-	1	2	3
C101.5	3	3	3	3	-	-	-	-	-	-	-	1	2	3
C101.6	3	3	3	3	-	-	-	-	-	-	-	1	2	3
C101	3.00	3.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.80	3.00

Course Code & Name: PH 100 ENGINEERING PHYSICS

SUBJECT CODE: C102	
COURSE OUTCOMES	
C102.1	Compute the quantitative aspects of waves and oscillations in engineering systems.
C102.2	Understand the importance of properties of light
C102.3	Classify and describe the properties of semiconductor materials and its application
C102.4	Acquire knowledge of basic principal of quantum mechanics and statistical mechanics
C102.5	Realize the importance of application of Acoustics and Ultrasonic
C102.6	Develop a comprehension of the current basis of board knowledge in photonics

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C102.1	3	3	3	3	-	-	-	-	-	-	-	3	1	1
C102.2	3	3	3	3	-	-	-	-	-	-	-	3	1	1
C102.3	3	3	3	3	-	-	-	-	-	-	-	3	1	1
C102.4	3	3	3	3	-	-	-	-	-	-	-	3	1	1
C102.5	3	3	3	3	-	-	-	-	-	-	-	3	1	1
C102.6	3	3	3	3	-	-	-	-	-	-	-	3	1	1
C102	3.00	3.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	1.00	1.00

Course Code & Name: CY 100 ENGINEERING CHEMISTRY

SUBJECT CODE: C103	
COURSE OUTCOMES	
C103.1	Understand various spectroscopic techniques like UV- Visible , IR , NMR, and its applications
C103.2	Apply the basic concepts of electrochemistry to explore its possible applications in various engineering fields
C103.3	Apply the knowledge of analytical method for characterizing a chemical mixture of a compound
C103.4	Apply the knowledge of conducting polymers and advanced polymers in engineering
C103.5	Understand about calorific value of fuels and lubricants and its properties
C103.6	Acquire knowledge about various types of water treatment methods to develop skills for treating waste water

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C103.1	3	2	-	3	-	3	-	-	-	-	-	2	-	-
C103.2	3	3	3	-	-	2	-	-	-	-	-	2	-	-
C103.3	2	-	2	3	-	-	-	-	-	-	-	2	-	2
C103.4	2	-	-	-	-	3	3	-	-	-	-	2	2	-
C103.5	3	3	3	2	-	3	3	2	-	-	-	3	-	-
C103.6	3	1	3	3	2	3	3	3	-	-	-	3	-	-
C103	2.70	2.25	2.75	2.75	2	2.8	3	2.5	0	0	0	2.3	2	2

Course Code & Name: BE 100 ENGINEERING MECHANICS

SUBJECT CODE: C104	
COURSE OUTCOMES	
C104.1	Understand the fundamental concepts of engineering mechanics
C104.2	Identify appropriate structural system for studying a given problem
C104.3	Understand the properties and theorems associated with planar surfaces
C104.4	Students will able to solve problems involving friction
C104.5	Analyze problem associated with dynamics
C104.6	Understand the concepts connected with force systems in space

CO Vs PO													
SUBJECT													
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C104.1	3	3	-	-	-	1	-	-	-	-	-	2	1	-
C104.2	3	3	3	-	-	2	-	-	-	-	-	3	1	-
C104.3	3	3	-	-	-	-	-	-	-	-	-	1	1	-
C104.4	3	3	2	-	-	3	2	-	-	-	-	2	-	-
C104.5	3	3	-	-	-	2	-	-	-	-	-	2	1	-
C104.6	3	3	3	-	-	3	-	-	-	-	-	2	-	-
C104	3.00	3.00	2.70	0.00	0.00	2.20	2.00	0.00	0.00	0.00	0.00	2.00	1.00	0.00

Course Code & Name: BE 110 ENGINEERING GRAPHICS

SUBJECT CODE: C105	
COURSE OUTCOMES	
C105.1	Understand Engineering Drawing Standards, dimensioning and preparation of drawings leading to illustration of Graphics as the communication language of Engineers
C105.2	Develop engineering drawings, leading to enhanced presentation skills of 3-D objects in 2-D plane / paper and improved visualizion of physical objects.
C105.3	Apply the principles of orthographic projections of lines, solids and sectioned views in the design of pipeline systems.
C105.4	Create isometric and perspective projections that help to reconstruct solutions to real-time engineering problems in 3D to provide better understanding.
C105.5	Create surface development of objects which will help to develop suitable models for industrial applications.
C105.6	Understand the concepts associated with intersection of surfaces and perspective projections

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C105.1	3	2	-	-	-	-	-	-	-	-	-	3	-	-
C105.2	3	-	-	-	-	-	-	-	-	-	-	2	-	-
C105.3	3	-	-	-	-	-	-	-	-	-	-	2	-	-
C105.4	3	-	-	3	3	-	-	-	3	3	-	3	3	3
C105.5	3	-	-	-	-	-	-	-	-	-	-	1	-	-
C105.6	3	-	-	-	-	-	-	-	-	-	-	1	2	-
C105	3.00	2.00	-	3.00	3.00	-	-	-	3.00	3.00	2.00	2.00	2.50	3.00

Course Code & Name: BE 101-02 INTRODUCTION TO MECHANICAL ENGINEERING SCIENCE

SUBJECT CODE: C106	
COURSE OUTCOMES	
C106.1	Understand the basic concept of thermodynamics
C106.2	Describe about basic priciples of engines, turbines and compressors
C106.3	Differentiate refrigeration and air conditioning
C106.4	Understand the main components of an automobiles
C106.5	List the different type of engineering materials
C106.6	Describe the different methods of manufacturing

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C106.1	3	3	-	-	-	2	2	-	-	-	-	3	2	-
C106.2	3	3	-	-	-	2	2	-	-	-	-	3	2	-
C106.3	3	3	-	-	-	2	2	-	-	-	-	3	2	-
C106.4	3	2	-	-	-	2	2	-	-	-	-	3	2	-
C106.5	3	1	-	-	-	2	2	-	-	-	-	3	2	-
C106.6	3	-	-	-	-	2	2	-	-	-	-	3	2	-
C106	3.00	2.40	-	-	-	2.00	2.00	-	-	-	-	3.00	2.00	-

Course Code & Name: BE 103 INTRODUCTION TO SUSTAINABLE ENGINEERING

SUBJECT CODE: C107	
COURSE OUTCOMES	
C107.1	Understand the role of engineering in sustainable development and environmental protection
C107.2	Acquire knowledge in global environmental issues and the consequent threats to sustainable development
C107.3	Develop simple, efficient and indigenous solutions to assess and overcome threats to sustainability
C107.4	Apply engineering methods and eco-friendly solutions to maintain a green environment
C107.5	Understand the relevance of non-conventional energy sources for sustainable development of the society
C107.6	Describe the role of technology in the sustainable development of society and industry

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C107.1	-	-	-	-	-	3	3	3	-	-	-	3	-	-
C107.2	-	-	-	-	-	3	3	3	-	-	-	3	-	-
C107.3	-	-	-	-	-	3	3	3	-	-	-	3	-	-
C107.4	-	-	-	-	-	3	3	3	-	-	-	3	-	-
C107.5	-	-	-	-	-	3	3	3	-	-	-	3	-	-
C107.6	-	-	-	-	-	3	3	3	-	-	-	3	-	-
C107	0.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00	0.00	0.00	0.00	3.00	0.00	0.00

Course Code & Name: CE 100 BASICS OF CIVIL ENGINEERING

SUBJECT CODE: C108	
COURSE OUTCOMES	
C108.1	To understand the role of civil engineering in building the nation.
C108.2	To able to understand the various building practices.
C108.3	To familiarize the instruments and various methods of surveying.
C108.4	To acquire knowledge about properties of various constructional materials.
C108.5	To acquaint the students with techniques in building construction
C108.6	To develop the knowledge in basic infra structural services.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C108.1	3	-	3	-	-	3	3	2	-	-	-	-	-	-
C108.2	3	3	3	-	-	3	2	3	-	-	-	-	-	-
C108.3	3	3	0	-	3	3	2	2	-	-	-	-	-	-
C108.4	3	-	0	-	2	3	2	2	-	-	-	-	-	-
C108.5	3	-	2	-	2	3	2	3	-	-	-	-	-	-
C108.6	3	-	2	-	-	3	2	2	-	-	-	-	-	-
C108	3.00	3.00	2.50	0.00	2.33	3.00	2.16	2.33	0.00	0.00	0.00	0.00	0.00	0.00

Course Code & Name: EE 100 BASICS OF ELECTRICAL ENGINEERING

SUBJECT CODE: C109	
COURSE OUTCOMES	
C109.1	Solve the elementary concepts of electrical circuits
C109.2	Acquire knowledge in magnetic circuits and ac fundamentals
C109.3	Analysis of single phase and three phase circuits
C109.4	Acquire knowledge in basic power generation systems
C109.5	Understand the working and construction of transformers.
C109.6	Describe about dc machines

CO Vs PO													
SUBJECT													
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C109.1	3	3	2	2	-	-	-	-	-	-	-	3	-	1
C109.2	3	3	2	2	-	-	-	-	-	-	-	3	-	1
C109.3	3	3	2	2	-	-	-	-	-	-	-	3	-	1
C109.4	3	3	2	2	-	-	-	-	-	-	-	3	-	1
C109.5	3	3	2	2	-	-	-	-	-	-	-	3	-	1
C109.6	3	3	2	2	-	-	-	-	-	-	-	3	-	1
C109	3.00	3.00	2.00	2.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	3.00	0.00	1.00

Course Code & Name: EC 100 BASICS OF ELECTRONICS ENGINEERING

SUBJECT CODE: C110	
COURSE OUTCOMES	
C110.1	Interpret the basic components of electronics
C110.2	Describe the working and characteristics of different diodes and BJT
C110.3	Recognize the working of rectifiers, power supplies, amplifiers and oscillators
C110.4	Identify analogue IC, Digital IC and Electronic instrumentation system.
C110.5	Explain the concepts in radio communication and satellite communication
C110.6	Define mobile communication, optical communication and entertainment electronics technology.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C110.1	3	2	-	3	-	-	-	-	-	-	-	2	2	1
C110.2	3	-	-	3	-	-	-	-	-	-	-	2	2	1
C110.3	3	2		3	-	-	-	-	-	-	-	2	2	1
C110.4	3	2	3	3	-	-	-	-	-	-	-	2	2	1
C110.5	3	-	3	3	-	-	-	-	-	-	-	2	2	1
C110.6	3	-	3	3	-	-	-	-	-	-	-	2	2	1
C110	3.00	2.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	1.00

Course Code & Name: MA102 DIFFERENTIAL EQUATIONS

SUBJECT CODE: C111	
COURSE OUTCOMES	
C111.1	Solve homogenous linear differential equation with constant coefficients
C111.2	Solve non- homogenous linear differential equation with constant coefficients
C111.3	Determine Taylor and Fourier series expansion of functions and its applications
C111.4	Understand the concept and the solution of partial differential equations
C111.5	Analyze and solve one dimensional Wave equation
C111.6	Analyze and solve one-dimensional Heat equation

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C111.1	3	3	3	3	-	-	-	-	-	-	-	2	2	1
C111.2	3	3	3	3	-	-	-	-	-	-	-	2	2	1
C111.3	2	3	3	3	-	-	-	-	-	-	-	2	2	1
C111.4	3	3	3	3	-	-	-	-	-	-	-	2	2	1
C111.5	3	3	3	3	-	-	-	-	-	-	-	2	2	1
C111.6	3	3	3	3	-	-	-	-	-	-	-	2	2	1
C111	2.83	3.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	1.00

Course Code & Name: BE 102 DESIGN AND ENGINEERING

SUBJECT CODE: C112	
COURSE OUTCOMES	
C112.1	Understand the different elements involved in good designs and practice them when called for.
C112.2	Solve the different stages of Design and formulate detailed designs with solid modeling and visualization.
C112.3	Acquire knowledge about prototype and propose various stages towards final product design.
C112.4	Build a broader perspective of design covering the function, cost, environmental sensitivity, safety and factors other than from engineering analysis
C112.5	Identify product oriented and user oriented aspects that make the customer required design.
C112.6	Utilize various modern engineering methods and build basic knowledge of Intellectual Property Rights.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C112.1	3	-	3	3	-	-	-	-	-	-	-	3	1	1
C112.2	3	-	3	3	-	-	-	-	-	-	-	3	1	1
C112.3	2	-	3	3	-	-	-	-	-	-	-	3	1	1
C112.4	3	-	3	3	-	-	-	-	-	-	-	3	1	1
C112.5	3	-	3	3	-	-	-	-	-	-	-	3	1	1
C112.6	3	-	3	3	-	-	-	-	-	-	-	3	1	1
C112	3.00	0.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	1.00	1.00

Course Code & Name: PH 110 ENGINEERING PHYSICS LAB

SUBJECT CODE: C113	
COURSE OUTCOMES	
C113.1	Examine the basic physical quantities, such as voltage, frequency, temperature etc. and evaluate measurement accuracy.
C113.2	Measure and analyze the properties of electrical and acoustic waves and oscillations, and demonstrate resonance.
C113.3	Demonstrate wave-like properties of light and measure the wavelength of monochromatic light sources
C113.4	Understand the propagation of light through an optical fiber and measure its numerical aperture
C113.5	Examine the working of devices such as solar cells and photoelectric cells
C113.6	Experimentally set up and measure fundamental constants such as the Planck's constant.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C113.1	3	3	-	-	-	-	-	-	3	-	-	2	1	1
C113.2	3	3	-	-	-	-	-	-	3	-	-	2	1	1
C113.3	3	3	-	-	-	-	-	-	3	-	-	2	1	1
C113.4	3	3	-	-	-	-	-	-	3	-	-	2	1	1
C113.5	3	3	-	-	-	-	-	-	3	-	-	2	1	1
C113.6	3	3	-	-	-	-	-	-	3	-	-	2	1	1
C113	3.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	3.00	0.00	0.00	2.00	1.00	1.00

Course Code & Name: CY 110 ENGINEERING CHEMISTRY LAB

SUBJECT CODE: C114	
COURSE OUTCOMES	
C114.1	Understand and measure the quality of water and environmental pollution.
C114.2	Analyze and identify unknown compounds from spectral measurements.
C114.3	Examine different polymers for industrial applications.
C114.4	Calculate the strength and pH of unknown solutions using different instrumental methods.
C114.5	Experimentally find out the percentage of metal present in metal ore.
C114.6	Demonstrate theoretical concepts of Engineering Chemistry.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C114.1	2	2	2	3	-	2	2	-	3	-	-	2	-	-
C114.2	2	2	2	3	-	2	2	-	3	-	-	2	-	-
C114.3	2	2	2	3	-	2	2	-	3	-	-	2	-	-
C114.4	2	2	2	3	-	2	2	-	3	-	-	2	-	-
C114.5	2	2	2	3	-	2	2	-	3	-	-	2	-	-
C114.6	2	2	2	3	-	2	2	-	3	-	-	2	-	-
C114	2.00	2.00	2.00	3.00	0.00	2.00	2.00	0.00	3.00	0.00	0.00	2.00	0.00	0.00

Course Code & Name: CE 110 CIVIL ENGINEERING WORKSHOP

SUBJECT CODE: C115	
COURSE OUTCOMES	
C115.1	Acquire knowledge about setting out of a building
C115.2	Understand about building area computation
C115.3	Develop the knowledge about leveling
C115.4	Acquire knowledge about Centre of gravity and moment of inertia in various steel sections
C115.5	Examine about area/ volume computation of various features of buildings
C115.6	Understand about bonds in brick masonry

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C115.1	3	1	3	-	1	1	1	1	3	-	-	3	-	-
C115.2	3	3	3	-	2	1	1	1	3	-	-	3	-	-
C115.3	3	3	3	-	3	1	1	1	3	-	-	3	-	-
C115.4	3	3	3	-	1	1	1	1	3	-	-	3	-	-
C115.5	3	3	3	-	2	1	1	1	3	-	-	3	-	-
C115.6	3	1	3	-	1	1	1	1	3	-	-	3	-	-
C115	3.00	3.00	3.00	0.00	3.00	1.00	1.00	1.00	3.00	0.00	0.00	3.00	0.00	0.00

Course Code & Name: ME 110 MECHANICAL ENGINEERING WORKSHOP

SUBJECT CODE: C116	
COURSE OUTCOMES	
C116.1	Examine various manufacturing processes in a basic mechanical engineering workshop, like smithy, carpentry, foundry and fitting
C116.2	Understand various hand tools used in basic mechanical engineering workshop sections, like smithy, carpentry, foundry and fitting.
C116.3	Choose different measuring devices necessary to carry out work in a workshop.
C116.4	Analyze the operations of various machine tools like lathe, milling, drilling and shaping machines.
C116.5	Acquire knowledge in assembling and disassembling machines like IC engines
C116.6	Construct models using basic mechanical workshop sections involving welding, molding, smithy, carpentry etc.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C116.1	3	-	3	-	-	3	-	-	3	-	-	3	2	2
C116.2	3	-	3	-	-	3	-	-	3	-	-	3	2	2
C116.3	3	-	3	-	-	3	-	-	3	-	-	3	2	2
C116.4	3	-	3	-	-	3	-	-	3	-	-	3	2	2
C116.5	3	-	3	-	-	3	-	-	3	-	-	3	2	2
C116.6	3	-	3	-	-	3	-	-	3	-	-	3	2	2
C116	3.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	2.00	2.00

Course Code & Name: EE 110 ELECTRICAL ENGINEERING WORKSHOP

SUBJECT CODE: C117	
COURSE OUTCOMES	
C117.1	Understand about power supplies and their limitations, standard voltages and their tolerances, safety aspects of electrical systems and the importance of protective measures in wiring systems
C117.2	Examine different configurations of wires, cables and other accessories used in wiring circuits and wire simple lighting circuits for domestic buildings
C117.3	Acquire knowledge about light and power circuits to control and measure circuit parameters such as current, voltage and power
C117.4	Describe about backup power supplies in domestic installations
C117.5	Experimentally understand all aspects of energy conservation in electrical systems

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C117.1	3	3	3	-	-	-	-	-	3	-	-	3	-	-
C117.2	3	3	2	-	-	-	-	-	3	-	-	3	-	-
C117.3	3	3	3	-	-	-	-	-	3	-	-	3	-	-
C117.4	3	2	2	-	-	-	-	-	3	-	-	3	-	-
C117.5	3	2	3	-	-	-	-	-	3	-	-	3	-	-
C117	3.00	2.80	2.80	0.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00

Course Code & Name: EE 110 ELECTRONICS ENGINEERING WORKSHOP

SUBJECT CODE: C118	
COURSE OUTCOMES	
C118.1	Understand the working of various electronic components and instruments
C118.2	Acquire knowledge to wire electronic circuits on bread board as per the circuit diagram and to design a dc power supply
C118.3	Design a dc power supply
C118.4	Design and implement basic transistor circuits
C118.5	Demonstrate soldering and printed circuit board design for electronic circuits.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C118.1	3	-	2	-	-	-	-	-	3	-	-	3	2	1
C118.2	3	-	2	-	-	-	-	-	3	-	-	3	2	1
C118.3	3	-	2	-	-	-	-	-	3	-	-	3	2	1
C118.4	3	-	2	-	-	-	-	-	3	-	-	-	-	-
C118.5	3	-	2	-	-	-	-	-	3	-	-	3	2	1
C118	3.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00	3.00	2.00	1.00

SECOND YEAR- SEMESTER 3 & 4		
SUBJECT CODE	**MAPPING CODE**	**SUBJECT NAME**
MA201	C 201	Linear Algebra & Complex Analysis
MR201	C 202	C Programming
EE209	C 203	Electrical Technology
EC209	C 204	Analog Electronics
MR205	C 205	Science of Measurements
HS200	C 206	Business Economics
HS210	C 207	Life Skills
EE235	C 208	Electrical Technology Lab
EC235	C 209	Analog Electronics Lab
MA202	C 210	Probability Distributions, Transforms and Numerical Methods
EC212	C 211	Linear Integrated Circuits and Digital Electronics
ME200	C 212	Fluid Mechanics & Machinery
MR202	C 213	Sensors and Actuators
ME210	C 214	Metallurgy and Materials Engineering
EC234	C 215	Linear Integrated Circuits and Digital Electronics Lab
ME230	C 216	Fluid Mechanics and Machinery Lab

Course Code & Name: MA 201 LINEAR ALGEBRA AND COMPLEX ANALYSIS

SUBJECT CODE: C201	
COURSE OUTCOMES	
C201.1	Solve any given system of linear equations
C201.2	Solve problems to find the Eigen values of a matrix and how to diagonalize a matrix
C201.3	Identify analytic functions and Harmonic functions.
C201.4	Acquire ability to evaluate real definite Integrals as application of Residue Theorem
C201.5	Gain knowledge to identify conformal mappings
C201.6	Find regions that are mapped under certain Transformations

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO 5	PO6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C201.1	3	3	3	3	-	-	-	-	-	-	-	3	1	1
C201.2	3	3	3	3	-	-	-	-	-	-	-	3	1	1
C201.3	3	3	3	3	-	-	-	-	-	-	-	3	1	1
C201.4	3	3	3	3	-	-	-	-	-	-	-	3	1	1
C201.5	3	3	3	3	-	-	-	-	-	-	-	3	1	1
C201.6	3	3	3	3	-	-	-	-	-	-	-	3	1	1
C 201	3.00	3.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	1.00	1.00

Course Code & Name: MR 201 C PROGRAMMING

SUBJECT CODE: C202	
COURSE OUTCOMES	
C202.1	Acquire knowledge on the components and working of computers
C202.2	Gain knowledge in computer networks and operating systems
C202.3	Acquire knowledge about the various elements of C programming
C202.4	Develop programs by understanding functions and program structures
C202.5	Acquire ability to develop programs using arrays
C202.6	Develop programs by understanding pointers, structures and file operations

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C202.1	3	1	2	-	-	-	-	-	-	-	-	1	2	2
C202.2	3	2	2	-	-	-	-	-	-	-	-	2	2	2
C202.3	3	3	3	-	-	-	-	-	-	-	-	2	2	2
C202.4	3	3	3	-	-	-	-	-	-	-	-	2	2	2
C202.5	3	3	3	-	-	-	-	-	-	-	-	2	2	2
C202.6	3	3	3	-	-	-	-	-	-	-	-	2	2	2
C202	3.00	2.50	2.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83	2.00	2.00

Course Code & Name: EE 209 ELECTRICAL TECHNOLOGY

SUBJECT CODE: C203	
COURSE OUTCOMES	
C203.1	Develop the basic knowledge in fundamentals of various circuit analysis techniques.
C203.2	Apply the various theorems in circuit analysis and its applications.
C203.3	Develop the knowledge about ac circuits and three phase RLC networks.
C203.4	Explain the construction, working and characteristics of DC machines in electrical engineering
C203.5	Explain the construction, working and characteristics of Induction machines and transformers in electrical engineering
C203.6	Develop the basic knowledge about various special electrical machines and their real time applications with case studies

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C203.1	3	2	-	2	-	-	-	-	-	-	-	2	2	2
C203.2	3	2	-	2	-	-	-	-	-	-	-	2	2	2
C203.3	3	2	-	2	-	-	-	-	-	-	-	2	1	2
C203.4	3	2	-	2	-	-	-	-	-	-	-	2	1	2
C203.5	3	2	3	2	-	-	-	-	-	-	-	2	1	2
C203.6	3	2	-	2	-	-	-	-	-	-	-	2	3	2
C203	3.00	2.00	3.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.66	2.00

Course Code & Name: EC 209 ANALOG ELECTRONICS

SUBJECT CODE: C204	
COURSE OUTCOMES	
C204.1	Acquire the basic knowledge and application of diodes
C204.2	Understand the various biasing methods and hybrid model of BJT
C204.3	Acquire the knowledge about FET and various feedback topologies
C204.4	Recognize the working and characteristics of power amplifiers
C204.5	Explain the working and characteristics of various types of oscillators.
C204.6	Acquire the basic knowledge about UJT, timer IC555 and PLL.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C204.1	3	2	2	-	-	-	-	-	-	-	-	2	2	1
C204.2	3	2	2	-	-	-	-	-	-	-	-	2	2	1
C204.3	3	2	2	-	-	-	-	-	-	-	-	2	2	1
C204.4	3	2	2	-	-	-	-	-	-	-	-	2	2	1
C204.5	3	2	2	-	-	-	-	-	-	-	-	2	2	2
C204.6	3	3	2	-	-	-	-	-	-	-	-	2	2	2
C204	3.00	2.17	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	1.33

Course Code & Name: MR 205 SCIENCE OF MEASUREMENTS

SUBJECT CODE: C205	
COURSE OUTCOMES	
C205.1	Describe measurement system and the types of errors in measurement
C205.2	Understand various parameters of measurement systems
C205.3	Acquire knowledge about various sensors and transducers
C205.4	Gain Knowledge about the working of various measurement instruments
C205.5	Understand the concept of linear and angular measurements
C205.6	Recognize various measurement methods.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C205.1	2	2	1	-	-	1	-	-	-	1	-	1	2	2
C205.2	3	2	2	-	-	2	-	-	-	1	-	2	2	2
C205.3	3	2	2	-	-	3	-	-	-	1	-	3	3	3
C205.4	3	2	2	-	-	2	-	-	-	1	-	3	3	3
C205.5	3	3	3	-	-	2	-	-	-	1	-	3	2	2
C205.6	3	3	3	-	-	2	-	-	-	1	-	3	3	2
C205	2.83	2.33	2.17	0.00	0.00	2.00	0.00	0.00	0.00	1.00	0.00	2.50	2.50	2.33

Course Code & Name: HS 200 BUSINESS ECONOMICS

SUBJECT CODE: C206	
COURSE OUTCOMES	
C206.1	Understand the prospective engineers with elementary Principles of Economics and Business Economics.
C206.2	Acquaint the students with tools and techniques that are useful in their profession in Business Decision Making which will enhance their employability;
C206.3	Apply business analysis to the "firm" under different market conditions;
C206.4	Apply economic models to examine current economic scenario and evaluate policy options for addressing economic issues
C206.5	Gain understanding of some Macroeconomic concepts to improve their ability to understand the business climate
C206.6	Prepare and analyze various business tools like balance sheet, cost benefit analysis and rate of returns at an elementary level

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C206.1	-	1	2	-	-	2	2	2	-	2	2	2	-	-
C206.2	-	1	2	-	-	2	2	2	-	2	2	2	-	-
C206.3	-	1	2	-	-	2	2	2	-	2	2	2	-	-
C206.4	-	1	2	-	-	2	2	2	-	2	2	2	-	-
C206.5	-	1	2	-	-	2	2	2	-	2	2	2	-	-
C206.6	-	1	2	-	-	2	2	2	-	2	2	2	-	-
C206	0.00	1.00	2.00	0.00	0.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	0.00	0.00

Course Code & Name: HS 210 LIFE SKILLS

SUBJECT CODE: C207	
COURSE OUTCOMES	
C207.1	Acquire knowledge to communicate effectively and make effective presentation
C207.2	Acquire knowledge to write different types of reports
C207.3	Identify how to face an interview and can make effective group discussion
C207.4	Capable of critically think on a particular problem and solve it.
C207.5	Work in groups & teams and can handle engineering ethics and human values

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C207.1	-	-	2	-	-	2	3	3	-	-	2	2	-	-
C207.2	-	-	2	3	-	2	3	3	-	-	2	2	-	-
C207.3	-	-	2	3	-	2	3	3	-	-	2	2	-	-
C207.4	-	-	2	-	-	2	3	3	-	-	2	2	-	-
C207.5	-	-	2	3	-	2	3	3	-	-	2	2	-	-
C207	0.00	0.00	2.00	3.00	0.00	2.00	3.00	3.00	0.00	0.00	2.00	2.00	0.00	0.00

Course Code & Name: EE235 ELECTRICAL TECHNOLOGY LAB

SUBJECT CODE: C208	
COURSE OUTCOMES	
C208.1	Acquire the basic knowledge in electric circuit theorems by experimental verification.
C208.2	Understand 3 phase balanced and unbalanced, star and delta connected supply and load and to measure power in 3 phase circuits
C208.3	Experimentally test the characteristics of DC machines under load and no load condition.
C208.4	Acquire knowledge about the speed control of DC motors.
C208.5	Demonstrate the Swinburne's test and acquire the knowledge in separation of losses in DC machines.
C208.6	Examine testing of the characteristics of single phase transformers under load condition, Three phase Induction Motors under load and no load condition.

CO Vs PO													
SUBJECT													
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C208.1	3	3	2	2	-	-	-	-	3	-	-	2	-	2
C208.2	3	3	2	2	-	-	-	-	3	-	-	2	-	2
C208.3	3	3	2	2	-	-	-	-	3	-	-	2	-	2
C208.4	3	3	2	2	-	-	-	-	3	-	-	2	-	2
C208.5	3	3	2	2	-	-	-	-	3	-	-	2	-	2
C208.6	3	3	2	2	-	-	-	-	3	-	-	2	-	2
C208	3.00	3.00	2.00	2.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00	2.00	0.00	2.00

Course Code & Name: EC235 ANALOG ELECTRONICS LAB

SUBJECT CODE: C209	
COURSE OUTCOMES	
C209.1	To acquire the basic knowledge about CRO by the measurement of current, voltage, frequency and phase shift.
C209.2	Develop working knowledge on rectifier circuits and its characteristics, diode clipping and clamping circuits.
C209.3	To acquire the basic knowledge about RC coupled amplifier by measuring gain, impedance & frequency response.
C209.4	Develop working knowledge on FET amplifiers by measuring gain & impedance.
C209.5	Experimentally test the working of voltage series feedback amplifier.
C209.6	Develop a working knowledge on voltage regulators, multi vibrators & RC phase shift oscillator

CO Vs PO													
SUBJECT													
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C209.1	3	2	1	2	-	-	-	-	3	-	-	2	2	2
C209.2	3	2	1	2	-	-	-	-	3	-	-	2	2	2
C209.3	3	2	2	2	-	-	-	-	3	-	-	-	2	2
C209.4	3	2	2	2	-	-	-	-	3	-	-	-	2	2
C209.5	3	2	2	2	-	-	-	-	3	-	-	2	2	2
C209.6	3	2	2	2	-	-	-	-	3	-	-	2	2	2
C209	3.00	2.00	1.67	2.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00	2.00	2.00	2.00

Course Code & Name: MA 202 PROBABILITY DISTRIBUTIONS, TRANSFORMS AND NUMERICAL METHODS

SUBJECT CODE: C210	
COURSE OUTCOMES	
C210.1	Understand the concept of discrete probability distribution.
C210.2	Acquire knowledge about the concept of continuous probability distribution.
C210.3	Analyze fourier integrals and transforms in various engineering applications
C210.4	Understand the concept and applications of Laplace transforms
C210.5	Acquire knowledge to solve various engineering problems using various numerical methods like Newton- Raphson Method, Lagrange's Interpolation formula, Newton's Forward & Backward difference formula.
C210.6	Solve various engineering problems using various numerical methods like Gauss Elimination, Gauss Seidal Iteration Method etc.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C210.1	3	3	3	3	-	-	-	-	-	-	-	3	2	2
C210.2	3	3	3	3	-	-	-	-	-	-	-	3	2	2
C210.3	3	3	3	3	-	-	-	-	-	-	-	3	2	2
C210.4	3	3	3	3	-	-	-	-	-	-	-	3	2	2
C210.5	3	3	3	3	-	-	-	-	-	-	-	3	2	2
C210.6	3	3	3	3	-	-	-	-	-	-	-	3	2	2
C210	3.00	3.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.00	2.00

Course Code & Name: EC 212 LIC AND DIGITAL ELECTRONICS

SUBJECT CODE: C211	
COURSE OUTCOMES	
C211.1	Acquire the basic knowledge about operational amplifiers.
C211.2	Understand the various application of op amp and its working
C211.3	Acquire the knowledge about various A/D and D/A converters and filters.
C211.4	Solve various Boolean functions using K-map and Quine-Mcclusky method.
C211.5	Design encoders, decoders and memories.
C211.6	Design various registers and counters

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C211.1	3	3	2	1	-	-	-	-	-	-	-	2	2	2
C211.2	3	3	2	1	-	-	-	-	-	-	-	2	2	2
C211.3	3	3	2	1	-	-	-	-	-	-	-	2	2	2
C211.4	3	3	3	2	-	-	-	-	-	-	-	2	2	2
C211.5	3	3	3	2	-	-	-	-	-	-	-	2	2	2
C211.6	3	3	3	2	-	-	-	-	-	-	-	2	2	2
C211	3.00	3.00	2.50	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00

Course Code & Name: ME 200 FLUID MECHANICS AND MACHINERY

SUBJECT CODE: C212	
COURSE OUTCOMES	
C212.1	Understand the fundamental concepts related to mechanics of fluids
C212.2	Develop the knowledge on pressure & its measurements
C212.3	Analyze about basic fluid equations
C212.4	Acquire knowledge on flow measuring instruments
C212.5	Interpret principles of fluid machines and devices.
C212.6	Analyze existing fluid systems and to apply acquired knowledge on real life problems.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C212.1	3	2	3	2	2	-	-	-	-	-	-	3	1	1
C212.2	3	3	3	2	2	-	-	-	-	-	-	3	1	2
C212.3	3	3	3	3	2	-	-	-	-	-	-	3	1	2
C212.4	3	3	3	3	2	-	-	-	-	-	-	3	2	2
C212.5	3	3	3	3	3	-	-	-	-	-	-	3	2	2
C212.6	3	3	3	3	3	-	-	-	-	-	-	3	2	2
C212	**3.00**	**2.83**	**3.00**	**2.67**	**2.33**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.00**	**1.50**	**1.83**

Course Code & Name: MR 202 SENSORS AND ACTUATORS

SUBJECT CODE: C213	
COURSE OUTCOMES	
C213.1	Acquire knowledge on hydraulic system
C213.2	Understand about the concepts of pneumatic system
C213.3	Describe concepts of NC system
C213.4	Identify the concepts of fluid control system
C213.5	Acquire knowledge on working of different compressors
C213.6	Understand the concept and working of control valves

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C213.1	3	3	2	2	-	-	-	-	-	-	2	3	3	2
C213.2	3	3	2	2	-	-	-	-	-	-	2	3	3	2
C213.3	3	3	2	2	-	-	-	-	-	-	2	3	3	2
C213.4	3	3	2	2	-	-	-	-	-	-	2	3	3	2
C213.5	3	3	2	2	-	-	-	-	-	-	2	3	3	2
C213.6	3	3	2	2	-	-	-	-	-	-	2	3	3	2
C213	3.00	3.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	3.00	3.00	2.00

Course Code & Name: ME210 METALLURGY AND MATERIALS ENGINEERING

SUBJECT CODE: C214	
COURSE OUTCOMES	
C214.1	Understand fundamental science relevant to materials
C214.2	Acquire knowledge on physical concepts of atomic radius, atomic structure, chemical bonds, crystalline and non-crystalline materials and defects of crystal structures, grain size, strengthening mechanisms, heat treatment of metals with mechanical properties and changes in structure
C214.3	Describe the behavior of materials in engineering applications and select the materials for various engineering applications.
C214.4	Understand the causes behind metal failure and deformation
C214.5	Determine properties of unknown materials and develop an awareness to apply this knowledge in material design.
C214.6	Acquire knowledge on the modern engineering materials

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C214.1	3	2	-	-	-	-	-	-	-	-	-	-	2	-
C214.2	3	2	-	-	-	-	-	-	-	-	-	-	-	-
C214.3	3	-	-	-	-	-	-	-	-	-	-	3	2	-
C214.4	3	-	-	-	-	-	-	-	-	-	-	-	2	-
C214.5	3	-	-	-	-	-	-	-	-	-	-	-	-	-
C214.6	3	-	-	-	-	-	-	-	-	-	-	-	2	-
C214	3.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.00	0.00

Course Code & Name: EC234 LIC AND DIGITAL ELECTRONICS LABORATORY

SUBJECT CODE: C215	
COURSE OUTCOMES	
C215.1	Acquire the basic knowledge about Operational amplifiers and its applications.
C215.2	Demonstrate the working of adder and subtractor circuits using logic ICs.
C215.3	Design and set up different shift registers and counters
C215.4	Acquire knowledge to generate various waveforms using op-amps
C215.5	Demonstrate different mathematical operations using op-amp

CO Vs PO													
SUBJECT													
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C215.1	3	3	3	3	-	-	-	-	3	-	-	2	3	3
C215.2	3	3	3	3	-	-	-	-	3	-	-	2	3	3
C215.3	3	3	3	3	-	-	-	-	3	-	-	2	3	3
C215.4	3	3	3	3	-	-	-	-	3	-	-	2	3	3
C215.5	3	3	3	3	-	-	-	-	3	-	-	2	3	3
C215	3.00	3.00	3.00	3.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00	2.00	3.00	3.00

Course Code & Name: ME230 FLUID MECHANICS AND MACHINES LABORATORY

SUBJECT CODE: C216	
COURSE OUTCOMES	
C216.1	Acquire the basic knowledge and experimentally determination of discharge through the flow measuring equipment – orifice meter, venturimeter
C216.2	Acquire the knowledge about factors affecting the efficiency of a centrifugal pump, reciprocating pump ,gear oil pump
C216.3	Demonstrate the factors related to the efficiency of Pelton wheel, Francis turbine, Kaplan turbine
C216.4	Examine the factors affecting the flow through pipes
C216.5	Acquire the basic knowledge about notches
C216.6	Examine about the major losses in a pipe flow & physical basis of Bernouli's equation

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C216.1	3	3	3	3	-	-	-	-	3	-	-	2	3	3
C216.2	3	3	3	3	-	-	-	-	3	-	-	2	3	3
C216.3	3	3	3	3	-	-	-	-	3	-	-	2	3	3
C216.4	3	3	3	3	-	-	-	-	3	-	-	2	3	3
C216.5	3	3	3	3	-	-	-	-	3	-	-	2	3	3
C216.6	3	3	3	3	-	-	-	-	3	-	-	2	3	3
C216	3.00	3.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	3.00	3.00	2.00

THIRD YEAR- SEMESTER 5 & 6		
SUBJECT CODE	**MAPPING CODE**	**SUBJECT NAME**
MR301	C 311	Linear Control Systems
MR303	C 312	Microprocessors and Microcontrollers
MR305	C 313	PLC and Data Acquisition Systems
MR307	C 314	Thermodynamics
ME220	C 315	Manufacturing Technology
MR363	C 316	Object Oriented Programming
MR365	C 317	Composite Materials
MR341	C 318	Design Project
MR331	C 319	Microprocessors and Microcontrollers Lab
MR333	C 310	Metrology and PLC Lab
MR302	C 321	Robotics Engineering
MR304	C 322	Digital Image Processing and Machine Vision
MR306	C 323	Mechanics of Solids
MR308	C 324	Digital Manufacturing
HS300	C 325	Principles of Management
MR364	C 326	Energy Engineering Management
AE403	C 327	Biomedical Instrumentation
MR332	C 328	Manufacturing Engineering Lab
MR334	C 329	Advanced Instrumentation Lab
MR352	C 320	Comprehensive Exam

Course Code & Name: MR301 LINEAR CONTROL SYSTEMS

SUBJECT CODE: C301	
COURSE OUTCOMES	
C301.1	Interpret about automatic control systems and their applications in designing of mechatronics system
C301.2	Understand about the Mathematical modeling and analogy of different systems
C301.3	Explain about time domain analysis
C301.4	Describe about stability analysis of control system
C301.5	Demonstrate concept of stability analysis in control systems using different plots
C301.6	Acquire knowledge in P, PI and PID controllers and compensation in control systems

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C301.1	3	3	3	3	-	-	-	-	-	-	-	3	3	3
C301.2	3	3	3	3	-	-	-	-	-	-	-	3	3	3
C301.3	3	3	3	3	-	-	-	-	-	-	-	3	3	3
C301.4	3	3	3	3	-	-	-	-	-	-	-	3	3	3
C301.5	3	3	3	3	-	-	-	-	-	-	-	3	3	3
C301.6	3	3	3	3	-	-	-	-	-	-	-	3	3	3
C301	3.00	3.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00

Course Code & Name: MR303 MICROPROCESSOR AND MICROCONTROLLERS

SUBJECT CODE: C302	
COURSE OUTCOMES	
C302.1	Acquire the knowledge about the architecture and interrupts of 8086 microprocessor.
C302.2	Develop 8086 microprocessor programming using various instructions.
C302.3	Acquire the knowledge about the interfacing of various ICs with 8086.
C302.4	Interpret about the architecture and interrupts of 8051 microcontroller.
C302.5	Develop 8051 microcontroller programming using various instructions.
C302.6	Acquire knowledge about the interfacing of various ICs with 8051.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C302.1	3	-	2	-	-	-	-	-	-	-	-	3	3	3
C302.2	3	2	3	2	-	-	-	-	-	-	-	3	3	3
C302.3	3	-	3	-	-	-	-	-	-	-	-	3	3	3
C302.4	3	-	2	-	-	-	-	-	-	-	-	3	3	3
C302.5	3	2	3	2	-	-	-	-	-	-	-	3	3	3
C302.6	3	-	3	-	-	-	-	-	-	-	-	3	3	3
C302	3.00	2.00	2.66	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00

Course Code & Name: MR305 PLC AND DATA ACQUISITION SYSTEM

SUBJECT CODE: C303	
COURSE OUTCOMES	
C303.1	Identify the need of computer in control system
C303.2	Explain about different data converters and its working principle
C303.3	Understand the design and need of data acquisition systems and interfacing
C303.4	Identify the capablilities of programmable logic controllers and its configuration
C303.5	Formulate proficiency in programming in PLC
C303.6	Interpret the requirements of communication network of PLC and interfacing with HMI system

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C303.1	3	1	2	-	-	-	-	-	-	-	-	3	3	3
C303.2	3	3	2	-	-	-	-	-	-	-	-	3	3	3
C303.3	3	2	3	3	3	-	-	-	-	-	-	3	3	3
C303.4	3	2	2	-	3	-	-	-	-	-	-	3	3	3
C303.5	3	2	2	-	-	-	-	-	-	-	-	3	3	3
C303.6	3	2	2	-	3	-	-	-	-	-	-	3	3	3
C303	**3.00**	**2.00**	**2.17**	**3.00**	**2.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.00**	**3.00**	**3.00**

Course Code & Name: MR307 THERMODYNAMICS

SUBJECT CODE: C304	
COURSE OUTCOMES	
C304.1	Understand about the concept of thermodynamics
C304.2	Acquire knowledge about the concepts of energy and 1st law of thermodynamics
C304.3	Define the concepts of 2nd law of thermodynamics
C304.4	Understand the concepts of entropy and law of degradation of energy
C304.5	Identify the concepts of 3rd law of thermodynamics
C304.6	Analyze about the psychometric properties of atmospheric air

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C304.1	3	-	2	-	-	-	-	-	-	-	-	3	2	2
C304.2	3	2	-	-	-	-	-	-	-	-	-	3	2	-
C304.3	3	1	-	1	-	-	-	-	-	-	-	3	2	1
C304.4	3	-	1	-	-	-	-	-	-	-	-	3	2	-
C304.5	3	1	-	-	-	-	-	-	-	-	-	3	2	-
C304.6	3	2	-	-	-	-	-	-	-	-	-	3	2	-
C304	3.00	1.50	0.50	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.00	1.50

Course Code & Name: ME220 MANUFACTURING TECHNOLOGY

SUBJECT CODE: C305	
COURSE OUTCOMES	
C305.1	Understand about different techniques of casting
C305.2	Acquire knowledge on different rolling processes and different rolled processes
C305.3	Describe different forging methods, cautions adopted in die design
C305.4	Identify various work and tool holding devices used in manufacturing
C305.5	Understand bending, shearing, drawing processes of sheet metal
C305.6	Interpret about welding metallurgy, weld ability and to introduce various metal joining techniques

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C305.1	3	-	3	-	-	-	-	-	-	-	-	3	3	3
C305.2	3	-	3	-	-	-	-	-	-	-	-	3	3	3
C305.3	3	-	3	-	-	-	-	-	-	-	-	3	3	3
C305.4	3	-	3	-	-	-	-	-	-	-	-	3	3	3
C305.5	3	-	3	-	-	-	-	-	-	-	-	3	3	3
C305.6	3	-	3	-	-	-	-	-	-	-	-	3	3	3
C305	3.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00

Course Code & Name: MR363 OBJECT ORIENTED PROGRAMMING

SUBJECT CODE: C306	
COURSE OUTCOMES	
C306.1	Understand the special features of object oriented programming approach in connection with C++
C306.2	Apply the concept of constructors.
C306.3	Apply the concept of Operator Overloading.
C306.4	Evaluate the different exception handling mechanisms.
C306.5	Apply virtual and pure virtual functions and complex programming situations.
C306.6	Illustrate the process of data file manipulations using C++.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C306.1	3	2	1	-	1	2	-	-	-	-	-	3	3	3
C306.2	3	3	1	2	2	-	-	-	-	-	-	3	2	3
C306.3	3	3	1	2	1	-	-	-	-	-	-	3	3	3
C306.4	3	3	2	3	-	-	-	-	-	-	-	3	2	2
C306.5	3	2	1	3	-	-	-	-	-	-	-	3	3	2
C306.6	3	1	2	-	2	-	-	-	-	-	-	3	2	2
C306	3.00	2.33	1.33	2.50	1.50	2.00	0.00	0.00	0.00	0.00	0.00	3.00	2.50	2.50

Course Code & Name: MR365 COMPOSITE MATERIALS

SUBJECT CODE: C307	
COURSE OUTCOMES	
C307.1	Acquire knowledge on introduction to composites
C307.2	Describe about the fabrication of composites
C307.3	Interpret about the testing aspects of composites
C307.4	Acquire knowledge about Nondestructive testing
C307.5	Understand the concept of special laminates
C307.6	Identify various recent trends in composite materials

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C307.1	3	-	-	-	-	-	-	-	-	-	-	-	-	-
C307.2	3	-	2	-	-	-	-	-	-	-	-	-	-	-
C307.3	3	2	2	-	-	-	-	-	-	-	-	-	1	-
C307.4	3	-	-	-	-	-	-	-	-	-	-	-	1	2
C307.5	3	-	-	-	-	-	-	-	-	-	-	-	-	-
C307.6	3	-	-	-	-	-	-	-	-	-	-	2	-	-
C307	3.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	2.00

Course Code & Name: MR 341 DESIGN PROJECT

SUBJECT CODE: C308	
COURSE OUTCOMES	
C308.1	Understand the engineering aspects of design with reference to simple products
C308.2	Create innovation in design of products, processes or systems
C308.3	Develop design that add value to products and solve technical problems

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C308.1	3	1	3	3	-	-	-	-	-	-	3	3	1	1
C308.2	3	3	3	3	-	-	-	-	3	-	3	3	3	3
C308.3	3	3	3	3	3	3	3	2	3	-	3	3	3	3
C308	3.00	2.30	3.00	3.00	3.00	3.00	3.00	2.00	3.00	0.00	3.00	3.00	2.30	2.30

Course Code & Name: MR331 MICROPROCESSOR AND MICROCONTROLLER LABORATORY

SUBJECT CODE: C309	
COURSE OUTCOMES	
C309.1	Design and implement programs on 8086 microprocessor
C309.2	To provide solid foundation on interfacing the external devices to the processor according to the user requirements
C309.3	Design and implement 8051 microcontroller based systems
C309.4	To Understand the concepts related to I/O and memory interfacing
C309.5	To learn about interfacing stepper motor working and its interfacing
C309.6	To learn about different types of flag registers and their changes while performing arithmetic operations, generation of waveforms using microcontroller

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C309.1	3	-	3	3	-	-	-	-	3	-	-	2	2	2
C309.2	3	-	3	3	-	-	-	-	3	-	-	2	2	2
C309.3	3	-	3	3	-	-	-	-	3	-	-	2	2	2
C309.4	3	-	3	3	-	-	-	-	3	-	-	2	2	2
C309.5	3	-	3	3	-	-	-	-	3	-	-	2	2	2
C309.6	3	-	3	3	-	-	-	-	3	-	-	2	2	2
C309	3.00	0.00	3.00	3.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00	2.00	2.00	2.00

Course Code & Name: MR333 METROLOGY AND PLC LAB

SUBJECT CODE: C310	
COURSE OUTCOMES	
C310.1	Experimentally test and familiarize the characteristics of strain gauge, load cell, LVDT, Thermo couple, Thermostat and LDR using measurements kits.
C310.2	Understand about the basics of PLC.
C310.3	Implement the PLC program for logic gates & flip flops and apply in hardware and simulation.
C310.4	Simulate and implement various control operations using PLC hardware and software.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C310.1	3	-	1	-	-	-	-	-	3	-	-	2	1	2
C310.2	3	-	1	-	-	-	-	-	3	-	-	2	1	2
C310.3	3	2	3	2	3	-	-	-	3	-	-	3	3	3
C310.4	3	3	3	3	3	-	-	-	3	-	-	3	3	3
C310	3.00	2.50	2.00	2.50	2.00	0.00	0.00	0.00	3.00	0.00	0.00	2.50	2.00	2.50

Course Code & Name: MR 302 ROBOTICS ENGINEERING

SUBJECT CODE: C311	
COURSE OUTCOMES	
C311.1	Acquire the basic knowledge in fundamentals of Robots and its anatomy.
C311.2	Understand the various drive mechanisms in robotics applications.
C311.3	Acquire knowledge about the various robot end effectors and grippers.
C311.4	Understand the various sensors used in robotics applications.
C311.5	Identify various kinematics and transformations in robotics interpolation.
C311.6	Interpret about various programming methods and real-time applications of robots.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C311.1	3	-	2	-	-	-	-	-	-	-	-	3	3	3
C311.2	3	-	2	-	-	-	-	-	-	-	-	3	3	3
C311.3	3	-	2	-	-	-	-	-	-	-	-	3	3	3
C311.4	3	-	2	-	-	-	-	-	-	-	-	3	3	3
C311.5	3	-	2	-	-	-	-	-	-	-	-	3	3	3
C311.6	3	3	3	3	-	-	-	-	-	-	-	3	3	3
C311	3.00	3.00	2.17	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00

Course Code & Name: MR 304 DIGITAL IMAGE PROCESSING AND MACHINE VISION

SUBJECT CODE: C312	
COURSE OUTCOMES	
C312.1	Understand the fundamentals of image processing and mathematical transforms necessary for image processing
C312.2	Inerpret the mathematical principles in digital image enhancement and apply them in spatial domain and frequency domain
C312.3	Acquire knowledge on different low level image processing tasks like filtering
C312.4	Identify various image compression techniques
C312.5	Apply various methods for segmenting image and identify image components
C312.6	Describe various techniques involved in machine vision

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C312.1	3	-	2	2	-	-	-	-	-	-	-	3	3	2
C312.2	3	-	2	2	-	-	-	-	-	-	-	3	3	2
C312.3	3	-	2	2	-	-	-	-	-	-	-	3	3	2
C312.4	3	3	2	2	-	-	-	-	-	-	-	3	3	2
C312.5	3	-	2	2	-	-	-	-	-	-	-	3	3	2
C312.6	3	-	2	2	-	-	-	-	-	-	-	3	3	2
C312	3.00	3.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	2.00

Course Code & Name: MR 306 MECHANICS OF SOLIDS

SUBJECT CODE: C313	
COURSE OUTCOMES	
C313.1	Acquire knowledge about the basic concepts of stress and strain in solids
C313.2	Impart knowledge on the methodologies to analyze stresses and strains at a point
C313.3	Understand the concepts of torsion in elastic circular bars
C313.4	Interpret about the concepts of stresses in beams
C313.5	Identify the concepts of shear force and bending moment in beams
C313.6	Understand about stresses in springs and columns with different conditions

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C313.1	3	3	-	-	-	-	-	-	-	-	-	2	2	2
C313.2	3	3	-	-	-	-	-	-	-	-	-	2	2	2
C313.3	3	3	2	3	-	-	-	-	-	-	-	2	2	2
C313.4	3	3	2	2	-	-	-	-	-	-	-	2	2	2
C313.5	3	3	-	3	-	-	-	-	-	-	-	2	2	2
C313.6	3	3	2	2	-	-	-	-	-	-	-	2	2	2
C313	3	3	2.00	2.5	0	0	0	0	0	0	0	2	2	2

Course Code & Name: MR 308 DIGITAL MANUFACTURING

SUBJECT CODE: C314	
COURSE OUTCOMES	
C314.1	Develop the knowledge in CIM and Numerical control machines
C314.2	Understand and familiarize in NC part programming
C314.3	Understand various controls in computer integrated manufacturing
C314.4	Analyze various sensors used in manufacturing and automation
C314.5	Understand various quality control and condition monitoring in manufacturing
C314.6	Analyze different techniques used in planning, data collection and automatic identification methods

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C314.1	3		3		2	-	-	-	-	-	-	3	3	3
C314.2	3	3	3	3	2	-	-	-	-	-	-	2	2	2
C314.3	3		3		2	-	-	-	-	-	-	2	2	2
C314.4	3	2	3		-	-	-	-	-	-	-	2	3	3
C314.5	3				-	-	-	-	-	-	-	3	3	3
C314.6	3	2	2		2	-	-	-	-	-	-	2	2	2
C314	3	2.30	2.80	3	2	0	0	0	0	0	0	2.3	2.5	2.5

Course Code & Name: HS300 PRINCIPLES OF MANAGEMENT

SUBJECT CODE: C315	
COURSE OUTCOMES	
C315.1	Acquire ability to manage people in the organization.
C315.2	Identify various management theories and practices
C315.3	Describe about the planning process for organizations
C315.4	Develop decisions for organization by identifying the limitations.
C315.5	Interpret about staffing and related HRD functions
C315.6	Understand the knowledge about leadership and controlling.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C315.1	-	-	2	-	-	3	1	3	3	1	3	2	-	-
C315.2	-	-	2	-	-	3	1	3	-	1	3	2	-	-
C315.3	-	-	2	-	-	3	1	3	3	1	3	2	-	-
C315.4	-	-	2	-	-	3	1	3	-	1	3	2	-	-
C315.5	-	-	2	-	-	3	1	3	2	1	3	2	-	-
C315.6	-	-	2	-	-	3	1	3	3	1	3	2	-	-
C315	0.00	0.00	2.00	0.00	0.00	3.00	1.00	3.00	2.75	1.00	3.00	2.00	0.00	0.00

Course Code & Name: MR 364 ENERGY ENGINEERING AND MANAGEMENT

SUBJECT CODE: C316	
COURSE OUTCOMES	
C316.1	Understand the basic concepts in solar energy engineering
C316.2	Describe concepts of bioenergy engineering
C316.3	Inerpret about the concepts of wind energy engineering
C316.4	Analyze various energy audit and management techniques
C316.5	Acquire knowledge about waste management techniques
C316.6	Inerpret about the concepts technology management

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C316.1	3	-	-	-	-	3	3	-	-	-	-	2	-	-
C316.2	3	-	-	-	-	3	3	-	-	-	-	2	-	-
C316.3	3	-	-	-	-	3	3	-	-	-	-	2	-	-
C316.4	3	-	-	-	-	3	2	-	-	-	-	2	-	-
C316.5	3	-	-	-	-	3	3	-	-	-	-	2	-	-
C316.6	3	-	-	-	-	3	2	-	-	-	-	2	-	-
C316	3.00	0.00	0.00	0.00	0.00	3.00	2.67	0.00	0.00	0.00	0.00	2.00	0.00	0.00

Course Code & Name: AE403 BIOMEDICAL INSTRUMENTATION

SUBJECT CODE: C317	
COURSE OUTCOMES	
C317.1	Understand knowledge about human physiology
C317.2	Describe about the principle of operation and the design of biomedical instruments
C317.3	Identify and familiarize with various biomedical instruments
C317.4	Acquire knowledge about biotelemetry
C317.5	Interpret different clinical analysis procedures
C317.6	Acquire knowledge on biomedical instruments and specific applications of biomedical engineering

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C317.1	2	-	3	-	2	3	-	-	-	-	-	2	2	1
C317.2	2	-	3	-	2	3	-	-	-	-	-	2	2	1
C317.3	2	-	3	-	3	3	-	-	-	-	-	2	2	1
C317.4	2	-	3	-	3	3	-	-	-	-	-	2	2	1
C317.5	2	-	3	-	3	3	-	-	-	-	-	2	2	1
C317.6	2	-	3	-	3	3	-	-	-	-	-	2	2	1
C317	2.00	0.00	3.00	0.00	2.70	3.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	1.00

Course Code & Name: MR332 MANUFACTURING ENGINEERING LAB

SUBJECT CODE: C318	
COURSE OUTCOMES	
C318.1	Acquire the basic knowledge in machining
C318.2	Examine shaper machine tool and milling machine
C318.3	Experimentally conduct taper turning, external and internal thread cutting, eccentric turning using lathe
C318.4	Demonstrate machining hexagon & square from round rod using milling and shaper machine
C318.5	Experimentally conduct spur gear and helical gear cutting in milling machine
C318.6	Demonstrate plain surface and cylindrical grinding and counter milling and familiarize CNC part programming

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C318.1	3	3	3	3	3	-	-	-	3	-	-	-	2	2
C318.2	3	2	3	2	1	-	-	-	3	-	-	2	2	2
C318.3	3	2	3	2	3	-	-	-	3	-	-	3	2	2
C318.4	3	-	-	-	-	-	-	-	3	-	-	2	2	2
C318.5	3	-	-	-	-	-	-	-	3	-	-	-	2	2
C318.6	3	2	3	3	3	-	-	-	3	-	-	3	2	2
C318	3.00	2.25	3.00	2.50	2.50	0.00	0.00	0.00	3.00	0.00	0.00	2.50	2.00	2.00

Course Code & Name: MR334 ADVANCED INSTRUMENTATION LAB

SUBJECT CODE: C319	
COURSE OUTCOMES	
C319.1	Examine the techniques for measuring process parameters
C319.2	Acquaint knowledge on techniques in metrology
C319.3	Examine advanced techniques for measuring parameters like presssure, force, torque and temperature
C319.4	Experimentally familiarize with basic measuring devices
C319.5	Demonstrate the procedure for calibration

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C319.1	3	2	3	3	-	-	-	-	3	-	-	3	3	3
C319.2	3	2	3	3	3	-	-	-	3	-	-	3	3	3
C319.3	3	2	3	3	3	-	-	-	3	-	-	3	3	3
C319.4	3	2	3	3	3	-	-	-	3	-	-	3	3	3
C319.5	3	2	3	3	-	-	-	-	3	-	-	3	3	3
C319	**3.00**	**2.00**	**3.00**	**3.00**	**3.00**	**0.00**	**0.00**	**0.00**	**3.00**	**0.00**	**0.00**	**3.00**	**3.00**	**3.00**

Course Code & Name: MR352 COMPREHENSIVE EXAM

SUBJECT CODE: C320	
COURSE OUTCOMES	
C320.1	Identify the comprehensive knowledge gained in basic courses relevant to the branch of study.
C320.2	Acquire ability to comprehend the questions asked and answer them with confidence.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C320.1	3	2	-	2	-	-	-	-	-	-	-	2	-	-
C320.2	3	2	-	2	-	-	-	-	-	-	-	2	-	2
C320	**3.00**	**2.00**	**0.00**	**2.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**2.00**	**0.00**	**2.00**

FINAL YEAR- SEMESTER 6 & 7		
SUBJECT CODE	**MAPPING CODE**	**SUBJECT NAME**
MR401	C 401	Advanced Automation Systems
MR403	C 402	Nanotechnology
MR405	C 403	Embedded Systems
MR407	C 404	Autotronics
MR409	C 405	Micro Electro Mechanical Systems
MR463	C 406	Bio Mechatronics
MR465	C 407	Entrepreneurship
MR451	C 408	Seminar & Project Preliminary
MR431	C 409	Mechatronics Lab
MR402	C 410	Soft Computing Techniques
MR404	C 411	Power Electronics and Drives
MR462	C 412	Industrial Electronics and Applications
MR464	C 413	Agile Manufacturing Systems
MR 466	C 414	Special Electrical Machines and Applications
MR492	C 415	Project

Course Code & Name: MR401 ADVANCED AUTOMATION SYSTEMS

SUBJECT CODE: C401	
COURSE OUTCOMES	
C401.1	Describe the functions of the elements of modern manufacturing systems
C401.2	Interpret the modern philosophies of automated manufacturing and the advanced automation systems
C401.3	Acquire knowledge about the functions of the elements of a manufacturing system
C401.4	Understand the functions of a cellular manufacturing system
C401.5	Explain the working of a common measurement systems
C401.6	Understand the functions of the elements of a flexible manufacturing system

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C401.1	3	-	2	-	-	-	-	-	-	-	-	3	3	3
C401.2	3	-	2	-	-	-	-	-	-	-	-	3	3	3
C401.3	3	-	2	-	-	-	-	-	-	-	-	3	3	3
C401.4	3	-	2	-	-	-	-	-	-	-	-	3	3	3
C401.5	3	-	2	-	-	-	-	-	-	-	-	3	3	3
C401.6	3	-	2	-	-	-	-	-	-	-	-	3	3	3
C401	3.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00

Course Code & Name: MR 403 NANOTECHNOLOGY

SUBJECT CODE: C402	
COURSE OUTCOMES	
C402.1	Understand about various Nano fabrication techniques
C402.2	Describe about Nano particles preparation techniques
C402.3	Interpret different kind of Microscopy to analyze the properties parameter
C402.4	Acquire knowledge in self-assembly of Nano material
C402.5	Explain about the making and etching layers in the lithography process
C402.6	Acquire knowledge in MEMS, NEMS, Nano Boats, Nano Medicines and Sensors.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C402.1	3	-	2	2	-	-	-	-	-	-	-	2	2	2
C402.2	3	-	2	2	-	-	-	-	-	-	-	2	2	2
C402.3	3	-	2	2	-	-	-	-	-	-	-	2	2	2
C402.4	3	-	2	2	-	-	-	-	-	-	-	2	2	2
C402.5	3	-	2	2	-	-	-	-	-	-	-	2	2	2
C402.6	3	-	2	2	-	-	-	-	-	-	-	2	2	2
C402	3.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00

Course Code & Name: MR 405 EMBEDDED SYSTEM

SUBJECT CODE: C403	
COURSE OUTCOMES	
C403.1	Acquire knowledge to design a embedded system
C403.2	Describe about the hardware and software components of embedded system
C403.3	Acquire knowledge on custom single purpose processor design and optimization
C403.4	Interpret about the general purpose processors
C403.5	Understand the concepts of common memory devices.
C403.6	Explain about various software development tools and RTOS

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C403.1	3	-	2	2	-	-	-	-	-	-	-	3	3	2
C403.2	3	-	2	2	-	-	-	-	-	-	-	3	3	2
C403.3	3	-	2	2	-	-	-	-	-	-	-	3	3	2
C403.4	3	-	2	2	-	-	-	-	-	-	-	3	3	2
C403.5	3	-	2	2	-	-	-	-	-	-	-	3	3	2
C403.6	3	-	2	2	-	-	-	-	-	-	-	3	3	2
C403	3.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	2.00

Course Code & Name: MR 407 AUTOTRONICS

SUBJECT CODE: C404	
COURSE OUTCOMES	
C404.1	Acquire the basic knowledge in fundamentals of automotive systems.
C404.2	Understand the various types of sensors used in automotive applications.
C404.3	Acquire the knowledge about fuel injection and ignition systems in automotive.
C404.4	Interpret about advanced comfort and safety systems used in automobiles
C404.5	Describe about electric and hybrid vehicles.
C404.6	Predict intelligent technologies applied in modern automotive systems.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C404.1	3	-	3	-	-	-	-	-	-	-	-	2	2	3
C404.2	3	-	3	-	3	-	-	-	-	-	-	2	2	3
C404.3	3	-	3	-	2	-	-	-	-	-	-	2	2	3
C404.4	3	-	3	-	2	-	-	-	-	-	-	2	2	3
C404.5	3	-	3	-	2	-	-	-	-	-	-	2	2	3
C404.6	3	-	3	-	2	-	-	-	-	-	-	2	2	3
C404	3.00	0.00	3.00	0.00	2.20	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	3.00

Course Code & Name: MR 409 MICRO ELECTRO MECHANICAL SYSTEM

SUBJECT CODE: C405	
COURSE OUTCOMES	
C405.1	Understand the basic knowledge about micro electro mechanical systems
C405.2	Acquire knowledge on micro manufacturing techniques
C405.3	Describe about micro fabrication and special machining
C405.4	Interpret about mechanical micromachining
C405.5	Explain about micro sensors and micro actuators
C405.6	Acquire knowledge on the application of MEMS in various industries

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C405.1	3	-	1	-	-	-	-	-	-	-	-	3	2	2
C405.2	3	-	2	-	-	-	-	-	-	-	-	3	2	2
C405.3	3	-	2	1	-	-	-	-	-	-	-	3	2	2
C405.4	3	-	1	-	-	-	-	-	-	-	-	3	2	2
C405.5	3	-	3	-	-	-	-	-	-	-	-	3	2	2
C405.6	3	-	3	1	-	-	-	-	-	-	-	3	2	2
C405	3.00	0.00	2.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.00	2.00

Course Code & Name: MR 463 BIOMECHATRONICS

SUBJECT CODE: C406	
COURSE OUTCOMES	
C406.1	Acquire knowledge on Sensors used in biomedical field
C406.2	Understand about the various equipment in biomedical applications
C406.3	Describe about various techniques of diagnosis
C406.4	Interpret about the various medical measurements
C406.5	Acquire knowledge on biomedical applications
C406.6	Understand the analysis capabilities of biomedical equipment's

CO Vs PO													
SUBJECT													
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C406.1	3	-	2	2	-	-	-	-	-	-	-	3	2	2
C406.2	3	-	2	2	-	-	-	-	-	-	-	3	2	2
C406.3	3	-	2	2	-	-	-	-	-	-	-	3	2	2
C406.4	3	-	2	2	-	-	-	-	-	-	-	3	2	2
C406.5	3	-	2	2	-	-	-	-	-	-	-	3	2	2
C406.6	3	-	2	2	-	-	-	-	-	-	-	3	2	2
C406	3.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.00	2.00

Course Code & Name: MR 465 ENTREPRENEURSHIP

SUBJECT CODE: C407	
COURSE OUTCOMES	
C407.1	Acquire the basic knowledge in fundamentals of entrepreneurship and its process.
C407.2	Understand the various characteristics and competencies of entrepreneurs.
C407.3	Describe about the fundamentals of Business and Projects.
C407.4	Acquire knowledge in process of starting new ventures and international business.
C407.5	Interpret about time management, planning and innovation in entrepreneurship.
C407.6	Understand various funding assistance for starting new venture.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C407.1	-	-	2	-	-	2	-	-	-	-	2	2	-	-
C407.2	-	-	2	-	-	2	-	-	-	-	2	2	-	-
C407.3	-	-	2	-	-	2	-	-	-	-	3	2	-	-
C407.4	-	-	2	-	-	2	-	-	-	-	3	2	-	-
C407.5	-	-	2	2	-	2	-	-	-	-	3	2	-	-
C407.6	-	-	2	3	-	2	-	-	-	-	3	2	-	-
C407	0.00	0.00	2.00	2.50	0.00	2.00	0.00	0.00	0.00	0.00	2.67	2.00	0.00	0.00

Course Code & Name: MR 451 SEMINAR AND PROJECT PRELIMINARY

SUBJECT CODE: C408	
COURSE OUTCOMES	
C408.1	Develop skills in doing literature survey, technical presentation and report presentation
C408.2	Acquire knowledge in project identification and execution of preliminary works on final project
C408.3	Design, model and develop a system or circuits related to specific applications using modern tools
C408.4	To plan and execute well defined objectives which are relevant to the society and to adapt with changes in technology and develop professional ethics
C408.5	Demonstrate and report the findings in standard formats and also develop individual and team work to accomplish an engineering task
C408.6	Understand the impact of professional engineering solutions in societal and environmental contests and demonstrate the knowledge for sustainable development and also can communicate effectively on engineering activities

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C408.1	3	2	3	3	3	3	-	-	3	3	3	3	3	3
C408.2	3	2	2	3	3	3	3	3	3	3	3	3	3	3
C408.3	3	3	3	3	3	3	-	-	3	3	3	3	3	3
C408.4	3	3	3	3	3	3	-	-	3	3	3	3	2	2
C408.5	3	2	2	3	3	3	-	-	3	3	3	3	-	-
C408.6	3	-	-	3	3	3	3	3	3	3	3	3	-	-
C408	**3.00**	**2.40**	**2.60**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**2.75**	**2.75**

Course Code & Name: MR 431 MECHATRONICS LAB

SUBJECT CODE: C409	
COURSE OUTCOMES	
C409.1	Examine various valves and cylinders used in pneumatic kits for various operations.
C409.2	Experimentally acquire the basic knowledge in assemble of electro-pneumatic kits for various operations.
C409.3	Experimentally analyze the speed control of stepper motor and servo motors, various sensors used in automotives.
C409.4	Analyze working of a pick and place robot.
C409.5	Apply the virtual instrumentation technique to analyze the operation of ADC and DAC.
C409.6	Apply the virtual instrumentation technique to analyze the operation of data acquisition and various mathematical and logical operation using Labview software and to study the automatic door opening and closing system using PLC.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C409.1	3	2	2	2	-	-	-	-	3	-	-	3	3	3
C409.2	3	2	2	2	-	-	-	-	3	-	-	3	3	3
C409.3	3	2	2	2	-	-	-	-	3	-	-	3	3	3
C409.4	2	2	2	2	3	-	-	-	2	-	-	3	3	3
C409.5	3	2	2	2	3	-	-	-	3	-	-	3	3	3
C409.6	3	2	3	2	3	-	-	-	3	-	-	3	3	3
C409	2.83	2.00	2.16	2.00	2.00	0.00	0.00	0.00	3.00	0.00	0.00	3.00	3.00	3.00

Course Code & Name: MR 402 SOFT COMPUTING TECHNIQUES

SUBJECT CODE: C410	
COURSE OUTCOMES	
C410.1	Understand the concepts of Fuzzy sets and fuzzy logic.
C410.2	Acquire knowledge to introduce types of Fuzzy Inference System and difference among them, review of gradient-based optimization techniques steepest descent method and Newton's method.
C410.3	Interpret about derivative-free optimization and supervised learning neural networks.
C410.4	Describe about Unsupervised Learning Neural Networks.
C410.5	Explain about Adaptive Neuro-Fuzzy Inference system and Coactive Neuro Fuzzy modeling.
C410.6	Acquire knowledge in Printed Character Recognition, Inverse Kinematics, Automobile Fuel Efficiency Prediction and Color Recipe Prediction.

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C410.1	3	-	3	-	-	-	-	-	-	-	-	3	2	2
C410.2	3	3	3	-	-	-	-	-	-	-	-	3	2	2
C410.3	3	3	3	3	-	-	-	-	-	-	-	3	2	2
C410.4	3	-	3	3	-	-	-	-	-	-	-	3	2	2
C410.5	3	-	2	-	-	-	-	-	-	-	-	3	2	2
C410.6	3	-	2	-	3	-	-	-	-	-	-	3	2	2
C410	3.00	3.00	2.67	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.00	2.00

Course Code & Name: MR404 POWER ELECTRONICS AND DRIVES

SUBJECT CODE: C411	
COURSE OUTCOMES	
C411.1	Understand the concepts of power semiconductor devices
C411.2	Describe about phase controlled converters
C411.3	Acquire knowledge about the design of choppers and switching regulators
C411.4	Understand the working of fixed DC to variable AC converters an to learn the modulation techniques employed in inverters
C411.5	Determine the performance parameters of controlled rectifiers and AC voltage controllers
C411.6	Acquire knowledge about the concepts of electric drive

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C411.1	3	-	-	-	-	-	-	-	-	-	-	2	2	2
C411.2	3	-	-	-	-	-	-	-	-	-	-	2	2	2
C411.3	3	-	2	-	-	-	-	-	-	-	-	2	2	2
C411.4	3	-	2	-	-	-	-	-	-	-	-	2	2	2
C411.5	3	-	2	-	-	-	-	-	-	-	-	2	2	2
C411.6	3	-	2	-	-	-	-	-	-	-	-	2	2	2
C411	3.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00

Course Code & Name: MR 462 INDUSTRIAL ELECTRONICS

SUBJECT CODE: C412	
COURSE OUTCOMES	
C412.1	Understand the use of basic electronic devices
C412.2	Acquire knowledge about electronic circuits
C412.3	Describe about the various types of power supplies
C412.4	Interpret about electronic heaters employed for induction heating
C412.5	Understand the principle of operation and working of switching circuits
C412.6	Explain about the application of power electronic devices in industrial installations

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C412.1	3	-	-	-	-	-	-	-	-	-	-	2	2	2
C412.2	3	-	-	-	-	-	-	-	-	-	-	2	2	2
C412.3	3	-	-	-	-	-	-	-	-	-	-	2	2	2
C412.4	3	-	2	-	-	-	-	-	-	-	-	2	2	2
C412.5	3	-	2	-	-	-	-	-	-	-	-	2	2	2
C412.6	3	-	2	-	-	-	-	-	-	-	-	2	2	2
C412	3.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00

Course Code & Name: MR464 AGILE MANUFACTURING SYSTEMS

SUBJECT CODE: C413	
COURSE OUTCOMES	
C413.1	Understand the basic concepts of agile manufacturing.
C413.2	Acquire knowledge about the conceptual and theoretical basis for the design and implementation of Advanced Manufacturing Systems
C413.3	Design and evaluate the performance of agile manufacturing systems.
C413.4	Describe about the traditional problems in work place
C413.5	Understand the concepts of skill and knowledge enhancing technologies
C413.6	Acquire knowledge on design of manufacturing enterprise

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C413.1	2	-	-	-	-	-	-	-	-	-	2	2	-	-
C413.2	2	-	-	-	-	-	-	-	-	-	2	2	-	-
C413.3	2	-		-	-	-	-	-	-	-	2	2	-	-
C413.4	2	-	-	-	-	-	-	-	-	-	2	2	-	-
C413.5	2	-	-	-	-	-	-	-	-	-	2	2	-	-
C413.6	2	-	-	-	-	-	-	-	-	-	2	2	-	-
C413	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00

MR 466 SPECIAL ELECTRICAL MACHINES AND APPLICATIONS

SUBJECT CODE: C414	
COURSE OUTCOMES	
C414.1	Understand about the working of special electrical machines
C414.2	Acquire knowledge about switched reluctance motors
C414.3	Describe about synchronous reluctance motors
C414.4	Explain about the working of PMDC motors
C414.5	Acquire knowledge about permanent magnetic synchronous motors
C414.6	Understand about the application of special electrical machines in mechatronics system

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C414.1	3	-	-	-	-	-	-	-	-	-	-	2	2	2
C414.2	3	-	-	-	-	-	-	-	-	-	-	2	2	2
C414.3	3	-	-	-	-	-	-	-	-	-	-	2	2	2
C414.4	3	-	2	-	-	-	-	-	-	-	-	2	2	2
C414.5	3	-	2	-	-	-	-	-	-	-	-	2	2	2
C414.6	3	-	2	-	-	-	-	-	-	-	-	2	2	2
C414	3.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00

Course Code & Name: PROJECT

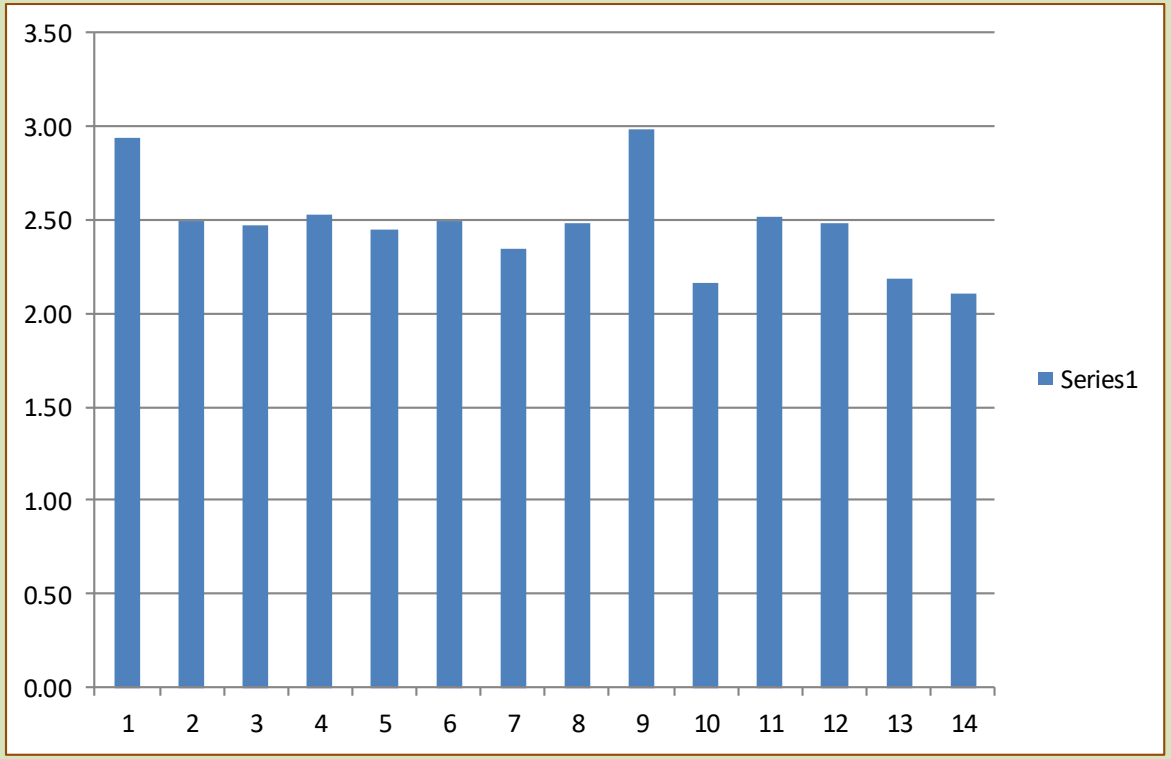
SUBJECT CODE: C415	
COURSE OUTCOMES	
C415.1	Acquire knowledge in project identification and execution of works on final project
C415.2	Design, model and develop a system or circuits related to specific applications using modern tools and also to plan and execute well defined objectives which are relevant to the society
C415.3	Understand changes in technology and develop professional ethics
C415.4	Develop individual and team work to accomplish an engineering task and demonstrate and report the findings in standard formats
C415.5	Understand the impact of professional engineering solutions in societal and environmental contests and demonstrate the knowledge for sustainable development
C415.6	Develop the ability to communicate effectively on engineering activities

CO Vs PO														
SUBJECT														
COURSE COUTCOME	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C415.1	3	2	3	3	3	3	-	-	3	3	3	3	3	3
C415.2	3	2	2	3	3	3	3	3	3	3	3	3	3	3
C415.3	3	3	3	3	3	3	-	-	3	3	3	3	3	3
C415.4	3	3	3	3	3	3	-	-	3	3	3	3	2	2
C415.5	3	2	2	3	3	3	-	-	3	3	3	3	-	-
C415.6	3	-	-	3	3	3	3	3	3	3	3	3	-	-
C415	**3.00**	**2.50**	**2.60**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**3.00**	**2.75**	**2.75**

COURSE CODE	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C101	**3.00**	**3.00**	**3.00**	**3.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1.00**	**1.83**	**3.00**
C102	**3.00**	**3.00**	**3.00**	**3.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3.00**	**1.00**	**1.00**
C103	**2.67**	**2.25**	**2.75**	**2.75**	**2.00**	**2.80**	**3.00**	**2.50**	**0**	**0**	**0**	**2.33**	**2.00**	**2.00**
C104	**3.00**	**3.00**	**2.67**	**0**	**0**	**2.20**	**2.00**	**0**	**0**	**0**	**0**	**2.00**	**1.00**	**0**
C105	**3.00**	**2.00**	**0.00**	**3.00**	**3.00**	**0.00**	**0.00**	**0.00**	**3.00**	**3.00**	**0.00**	**2.00**	**2.50**	**3.00**
C106	**3.00**	**2.40**	**0**	**0**	**0**	**2.00**	**2.00**	**0**	**0**	**0**	**0**	**3.00**	**2.00**	**0**
C107	**0**	**0**	**0**	**0**	**0**	**3.00**	**3.00**	**3.00**	**0**	**0**	**0**	**3.00**	**0**	**0**
C108	**3.00**	**3.00**	**2.50**	**0**	**2.33**	**3.00**	**2.17**	**2.33**	**0**	**0**	**0**	**0**	**0**	**0**
C109	**3.00**	**3.00**	**2.00**	**2.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3.00**	**0**	**1.00**
C110	**3.00**	**2.00**	**3.00**	**3.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2.00**	**2.00**	**1.00**
C111	**2.83**	**3.00**	**3.00**	**3.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2.00**	**2.00**	**1.00**
C112	**2.83**	**0**	**3.00**	**3.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3.00**	**1.00**	**1.00**
C113	**3.00**	**3.00**	**0**	**0**	**0**	**0**	**0**	**0**	**3.00**	**0**	**0**	**2.00**	**1.00**	**1.00**
C114	**2.00**	**2.00**	**2.00**	**3.00**	**0**	**2.00**	**2.00**	**0**	**3.00**	**0**	**0**	**2.00**	**0**	**0**
C115	**3.00**	**2.33**	**3.00**	**0**	**1.67**	**1.00**	**1.00**	**1.00**	**3.00**	**0**	**0**	**3.00**	**0**	**0**
C116	**3.00**	**0**	**3.00**	**0**	**0**	**3.00**	**0**	**0**	**3.00**	**0**	**0**	**3.00**	**2.00**	**2.00**
C117	**3.00**	**2.60**	**2.60**	**0**	**0**	**0**	**0**	**0**	**3.00**	**0**	**0**	**3.00**	**0**	**0**
C118	**3.00**	**0**	**2.00**	**0**	**0**	**0**	**0**	**0**	**3.00**	**0**	**0**	**3.00**	**2.00**	**1.00**
C201	**3.00**	**3.00**	**3.00**	**3.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.00**	**1.00**	**1.00**
C202	**3.00**	**2.50**	**2.67**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1.83**	**2.00**	**2.00**
C203	**3.00**	**2.00**	**3.00**	**2.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2.00**	**1.67**	**2.00**
C204	**3.00**	**2.17**	**2.00**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2.00**	**2.00**	**1.33**

C205	2.83	2.33	2.17	0	0	2.00	0	0	0	1.00	0	2.50	2.50	2.33
C206	0	1.00	2.00	0	0	2.00	2.00	2.00	0	2.00	2.00	2.00	0	0
C207	0	0	2.00	3.00	0	2.00	3.00	3.00	0	0	2.00	2.00	0	0
C208	3.00	3.00	2.00	2.00	0	0	0	0	3.00	0	0	2.00	0	2.00
C209	3.00	2.00	1.67	2.00	0	0	0	0	3.00	0	0	2.00	2.00	2.00
C210	3.00	3.00	3.00	3.00	0	0	0	0	0	0	0	3.00	2.00	2.00
C211	3.00	3.00	2.50	1.50	0	0	0	0	0	0	0	2.00	2.00	2.00
C212	3.00	2.83	3.00	2.67	2.33	0	0	0	0	0	0	3.00	1.50	1.83
C213	3.00	3.00	2.00	2.00	0	0	0	0	0	0	2.00	3.00	3.00	2.00
C214	3.00	2.00	0	0	0	0	0	0	0	0	0	3.00	2.00	0
C215	3.00	3.00	3.00	3.00	0	0	0	0	3.00	0	0	2.00	3.00	3.00
C216	3.00	3.00	3.00	3.00	0	0	0	0	3.00	0	0	2.00	3.00	3.00
C301	3.00	3.00	3.00	3.00	-	-	-	-	-	-	-	3.00	3.00	3.00
C302	3	2	2.66	2	-	-	-	-	-	-	-	3	3	3
C303	3	2	2.17	3	2	-	-	-	-	-	-	3	3	3
C304	3	1.5	1.5	1	-	-	-	-	-	-	-	3	2	1.5
C305	3	-	3	-	-	-	-	-	-	-	-	3	3	3
C306	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C307	3	2	2	-	-	-	-	-	-	-	-	2	1	2
C308	3	2.3	3	3	3	3	3	2	3	-	3	3	2.3	2.3
C309	3	-	3	3	-	-	-	-	3	-	-	2	2	2
C310	3	2.5	2	2.5	2	-	-	-	3	-	-	2.5	2	2.5
C311	3	3	2.17	3	-	-	-	-	-	-	-	3	3	3
C312	3	3	2	2	-	-	-	-	-	-	-	3	3	2

C313	3	3	2	2.5	-	-	-	-	-	-	-	2	2	2
C314	3	2.3	2.8	3	2	-	-	-	-	-	-	2.3	2.5	2.5
C315	-	-	2	-	-	3	1	3	2.75	1	3	2	3	2
C316	3	-	-	-	-	3	2.67	-	-	-	-	2	-	-
C317	2	-	3	-	2.67	3	-	-	-	-	-	2	2	1
C318	3	2.25	3	2.5	2.5	-	-	-	3	-	-	2.5	2	2
C319	3	2	3	3	3	-	-	-	3	-	-	3	3	3
C320	3	2	-	2	-	-	-	-	-	-	-	2	-	2
C401	3.00	0	2.00	0	0	0	0	0	0	0	0	3.00	3.00	3.00
C402	3.00	0	2.00	2.00	0	0	0	0	0	0	0	2.00	2.00	2.00
C403	3.00	0	2.00	2.00	0	0	0	0	0	0	0	3.00	3.00	2.00
C404	3.00	0	3.00	0	2.20	0	0	0	0	0	0	2.00	2.00	3.00
C405	3.00	0	2.00	1.00	0	0	0	0	0	0	0	3.00	2.00	2.00
C406	3.00	0	2.00	2.00	0	0	0	0	0	0	0	3.00	2.00	2.00
C407	0	0	2.00	2.50	0	2.00	0	0	0	0	2.67	2.00	0	0
C408	3.00	2.40	2.60	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.75	2.75
C409	2.83	2.00	2.17	2.00	2.00	0	0	0	3.00	0	0	3.00	3.00	3.00
C410	3.00	3.00	2.67	3.00	3.00	0	0	0	0	0	0	3.00	2.00	2.00
C411	3.00	0	2.00	0	0	0	0	0	0	0	0	2.00	2.00	2.00
C412	0	0	0	0	0	0	0	0	0	0	0		0	0
C413	2.00	0	0	0	0	0	0	0	0	0	2.00	2.00	0	0
C414	3.00	0	2.00	0	0	0	0	0	0	0	0	2.00	2.00	2.00
C415	3.00	2.40	2.60	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.75	2.75
AVG	2.94	2.49	2.47	2.53	2.45	2.50	2.35	2.48	2.99	2.17	2.52	2.48	2.19	2.11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