Department of Mechatronics Engineering

Regulation 2021 – UG

Year/Semester: I/I	
C101/ HS3151/Professional English-I	
C101.1	To use appropriate words in a professional context
C101.2	To gain understanding of basic grammatical structures and use them in right context
C101.3	To read and infer the denotative and connotative meanings of technical texts
C101.4	To write definitions, descriptions, narrations and essays on various topics
C101.5	To inculcate oneself about the recent trends of innovation ideas in English
C102/ MA3151/Matrices And Calculus	
C102.1	Use the matrix algebra methods for solving practical problems.
C102.2	Apply differential calculus tools in solving various application problems.
C102.3	Able to use differential calculus ideas on several variable functions.
C102.4	Apply different methods of integration in solving practical problems.
C102.5	Apply multiple integral ideas in solving areas, volumes and other practical problems.
C103/PH3151/Engineering Physics	
C103.1	Understand the importance of mechanics.
C103.2	Express their knowledge in electromagnetic waves.
C103.3	Demonstrate a strong foundational knowledge in oscillations, optics and lasers
C103.4	Understand the importance of quantum physics.
C103.5	Comprehend and apply quantum mechanical principles towards the formation of energy bands.
C104/CY3151/Engineering Chemistry	
C104.1	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.
C104.2	To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nonmaterial's for engineering and technology applications
C104.3	To apply the knowledge of phase rule and composites for material selection requirements.
C104.4	To recommend suitable fuels for engineering processes and applications.
C104.5	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.
C105 / GE3151/ Problem Solving And Python Programming	
C105.1	Develop algorithmic solutions to simple computational problems
C105.2	Develop and execute simple Python programs.
C105.3	Write simple Python programs using conditionals and looping for solving problems.
C105.4	Decompose a Python program into functions.

C105.5	Represent compound data using Python lists, tuples, dictionaries etc
C106 / GE3152/Heritage of Tamils	
C106.1	Understand the nuances of literary terms and their usage in literary texts
C106.2	Analyze the rock art paintings to modern art sculpture
C106.3	Develop the life skills through folk and material arts
C106.4	Acquire knowledge about Thinai concept of Tamils
C106.5	Distinguish the different cultural politics and imbibe the distinguished cultural values
C107 / GE3171/ Problem Solving And Python Programming Laboratory	
C107.1	Develop algorithmic solutions to simple computational problems
C107.2	Develop and execute simple Python programs.
C107.3	Implement programs in Python using conditionals and loops for solving problems.
C107.4	Deploy functions to decompose a Python program.
C107.5	Process compound data using Python data structures
C108/BS3171/Physics and Chemistry Laboratory	
C108.1	Understand the functioning of various physics laboratory equipment.
C108.2	Access, process and analyze scientific information
C108.3	To analyze the quality of water samples with respect to their acidity, alkalinity, Hardness and DO.
C108.4	To analyze and determine the composition of alloys
C108.5	To quantitatively analyze the impurities in solution by electro analytical techniques
C109/GE3172/ English Laboratory	
C109.1	To listen and comprehend complex academic texts
C109.2	To speak fluently and accurately in formal and informal communicative contexts
C109.3	To express their opinions effectively in both oral and written medium of communication
C109.4	To converse fluently with the strangers
C109.5	To direct the people about the directions
Year/Semester: I/II	
C110 / HS3251/ Professional English II	
C110.1	To compare and contrast products and ideas in technical texts.
C110.2	To identify cause and effects in events, industrial processes through technical texts
C110.3	To analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format.
C110.4	To report events and the processes of technical and industrial nature.
C110.5	To present their opinions in a planned and logical manner, and draft effective resumes in context of job search.

C111 / MA3251/ Statistics and Numerical Methods	
C111.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C111.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture
C111.3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C111.4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
C111.5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.
C112 / PH3259/ Applied Materials Science	
C112.1	Know basics of crystallography and its importance for varied materials properties.
C112.2	Understand the properties of materials through the study of phase relationships
C112.3	Gain knowledge on the electrical and magnetic properties of materials and their applications
C112.4	Understand clearly of semiconductor physics and functioning of semiconductor devices
C112.5	Understand the optical properties of materials and working principles of various optical devices.
C113 /BE3253/Basic Electrical, Electronics Engineering and Measurements	
C113.1	Compute the electric circuit parameters for simple problems
C113.2	Explain the working principle and applications of electrical machines
C113.3	Analyze the characteristics of analog electronic devices
C113.4	Explain the basic concepts of linear integrated circuits
C113.5	Explain the operating principles of measuring instruments.
C114 /GE3251/ Engineering Graphics	
C114.1	Use BIS conventions and specifications for engineering drawing.
C114.2	Construct the conic curves, involutes and cycloid.
C114.3	Solve practical problems involving projection of lines.
C114.4	Draw the orthographic, isometric and perspective projections of simple solids.
C114.5	Draw the development of simple solids.
C115 /GE3252/Tamils and Technology	
C115.1	Know the basics of weaving and ceramic technology
C115.2`	To design the structural and construction of building materials
C115.3	Analyze the art of ship building
C115.4	To gain the knowledge of specific society
C115.5	To develop the scientific Tamil and Tamil computing
C116 /GE3271/Engineering Practices Laboratory	
C116.1	Draw pipe line plan; lay and connect various pipe fittings used in common

	household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.
C116.2	Wire various electrical joints in common household electrical wire work.
C116.3	Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work.
C116.4	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.
C116.5	Demonstrate Plumbing requirements of domestic buildings
C117 /BE8261/ Basic Electrical, Electronics Engineering Laboratory	
C117.1	Use experimental methods to verify the Ohm's and Kirchhoff's Laws.
C117.2	Analyze experimentally the load characteristics of electrical machines
C117.3	Analyze the characteristics of basic electronic devices
C117.4	Use DSO to measure the various parameters
C117.5	Choose the Instrument for Electrical measurement for a specific application.
C118 /GE3272/ Communication Laboratory	
C118.1	Speak effectively in group discussions held in formal/semi formal contexts.
C118.2	Write emails and effective job applications.
C118.3	Write short essays and reports in formal/semi formal contexts.
C118.4	To express their opinions effectively in writing a short article
C118.5	Write the winning job application
Year/Semester: II/III	
C201/ MA3351/Transforms and Partial Differential Equations	
C201.1	Understand how to solve the given standard partial differential equations.
C201.2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
C201.3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations
C201.4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
C201.5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.
C202/ ME3351 / Engineering Mechanics	
C202.1	Illustrate the vector and scalar representation of forces and moments
C202.2	Analyze the rigid body in equilibrium
C202.3	Evaluate the properties of distributed forces
C202.4	Determine the friction and the effects by the laws of friction
C202.5	Calculate dynamic forces exerted in rigid body
C203/ MF3391 / Mechanics of Materials	

C203.1	Apply the principle concepts behind stress, strain and deformation of solids for various engineering applications
C203.2	Analyze the transverse loading on beams and stresses in beam for various engineering applications.
C203.3	Analyze the torsion principles on shafts and springs for various engineering applications
C203.4	Analyze the deflection of beams for various engineering applications.
C203.5	Understanding the concept of theories of failure
C204/ MR3351 / Fluid Mechanics and Thermal Systems	
C204.1	Recognize the fluid properties, fluid statics and laws of thermodynamics
C204.2	Interpret the problems related to kinematics and dynamics of fluids and thermal systems
C204.3	Review the energy losses in flow through pipes and steady flow equation in thermal systems.
C204.4	Analyze the fluid flow and thermal process
C204.5	Solve the problems related to fluid and thermal systems
C205/ MR3391 / Digital Electronics and Microprocessor	
C205.1	State the fundamental operating concepts behind digital logic circuits and microprocessors.
C205.2	Recognize the use of various digital logic circuits and sub units in microprocessors.
C205.3	Sketch the digital logic circuits and the architectures of microprocessors
C205.4	Design the DLC and Microprocessor for the standard applications.
C205.5	Create the circuits using DLC and Microprocessor for given applications
C206/ MR3392 / Electrical Drives and Actuators	
C206.1	Recognize the principles and working of relays, drives and motors
C206.2	Explain the working and characteristics of various drives and motors.
C206.3	Apply the solid state switching circuits to operate various types of Motors and Drivers
C206.4	Interpret the performance of Motors and Drives
C206.5	Suggest the Motors and Drivers for given applications.
C207/ MR3361 / Electrical Drives and Actuators Laboratory	
C207.1	Practice the basic working of AC, DC motor, stepper motor, servo motor and synchronous motor using power electronic drive
C207.2	Demonstrate the control of AC, DC motor, stepper motor, servo motor and synchronous motor using power electronic drive
C207.3	Analyze the performance of AC, DC motor, stepper motor, servo motor and synchronous motor using power electronic drive
C207.4	Discuss the characteristics of DC and AC Machines
C207.5	Associate the various electrical drive and its power rating for different loading conditions
C208/ MR3311 / Design and Modeling Laboratory	

C208.1	Create 2D drawing and 3D models for part design and model developments.
C208.2	Integrate the parts and capable to simulate motion functionality of the model virtually
C208.3	Analyze the Design, assembly and visualize the motion of machines and robots.
C208.4	Analyze the commands and procedure for 2D drawing
C208.5	Develop assembly drawings both manually and using standard CAD packages
C209/ GE3361 / Professional Development	
C209.1	Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements
C209.2	Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding
C209.3	Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.
C209.4	Participate confidently in Group Discussions
C209.5	Develop adequate soft skills required for the work place.
Year/Semester: II/IV	
C210/ ME3493/Manufacturing Technology	
C210.1	Apply the mechanism of metal removal process and to identify the factors involved in improving machinability.
C210.2	Describe the constructional and operational features of centre lathe and other special purpose lathes.
C210.3	Describe the constructional and operational features of reciprocating machine tools.
C210.4	Apply the constructional features and working principles of CNC machine tools.
C210.5	Demonstrate the Program CNC machine tools through planning, writing codes and setting up CNC machine tools to manufacture a given component.
C211/ MR3451/Kinematics and Dynamics of Machinery	
C211.1	Recognize the basic terminologies of kinematics and dynamics of machines
C211.2	Interpret the various concepts of kinematics and dynamics including forces and frictions
C211.3	Show the motions parameters on the various mechanisms, gears and gear trains.
C211.4	Apply the mechanism, gears and gear train for the design of new machines.
C211.5	Analyze the working of various mechanism, gears and gear train.
C212/ MR3491/Sensors and Instrumentation	
C212.1	Recognize with various calibration techniques and signal types for sensors.
C212.2	Describe the working principle and characteristics of force, magnetic, heading,

	pressure and temperature, smart and other sensors and transducers.
C212.3	Apply the various sensors and transducers in various applications
C212.4	Select the appropriate sensor for different applications.
C212.5	Acquire the signals from different sensors using Data acquisition systems.
C213/ MR3492/Embedded Systems and Programming	
C213.1	Know the various functional units of microcontroller, processors and system-on-chip based on the features and specifications.
C213.2	Recognize the role of each functional units in microcontroller, processors and system- on-chip based on the features and specifications.
C213.3	Interface the sensors, actuators and other I/O's with microcontroller, processors and system on chip based interfacing
C213.4	Design the circuit and write the programming microcontroller, processors and system on chip
C213.5	Develop the applications using Embedded system.
C214/ MR3452/Control Systems Engineering	
C214.1	State the various control terminologies and concepts.
C214.2	Know the procedures in developing the transfer function, state space models and time and frequency domain analysis methods.
C214.3	Apply the procedures on developing the systems in transfer function and state space approach and apply to evaluate the performance of system in time and frequency domain techniques.
C214.4	Illustrate the time and frequency response characteristics of system response.
C214.5	Analyze the performance of system using various time and frequency domain techniques.
C215/ GE3451/Environmental sciences and Sustainability	
C215.1	Understand the nature and its impacts on human life.
C215.2	The students have the knowledge and awareness of Environmental Pollution.
C215.3	Understanding of the energy sources and scientific concepts/principles behind them
C215.4	Understand the concepts of the Sustainability and Management
C215.5	Understand the Sustainability Practices and socio economical changes
C216/ MR3461/ Sensors and Instrumentation Laboratory	
C216.1	Demonstrate the various contact and non-contact sensors.
C216.2	Analyze and Identify appropriate sensors for given applications.

C216.3	Create a sensor system for given requirements.
C216.4	Generate appropriate design procedure, suitable for signal conversion to interface with computer
C216.5	Generate appropriate design procedure to obtain a required measurement data for temperature, force, humidity, displacement and sound.
C217/ ME3382/ Manufacturing Technology Laboratory	
C217.1	Demonstrate the safety precautions exercised in the mechanical workshop and join two metals using GMAW.
C217.2	The students able to make the work piece as per given shape and size using machining process such as rolling, drawing, turning, shaping, drilling and milling.
C217.3	The students become make the gears using gear making machines and analyze the defects in the cast and machined components
C217.4	Produce cutting key ways using shaper machine as per given drawing
C217.5	Perform the Plain training, taper turning and thread cutting and operation for a given specification

HOD/MECHT **PRINCIPAL**

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Department of Mechatronics Engineering

Regulation 2017 – UG

Year/Semester: I/I	
C101/ HS8151/COMMUNICATIVE ENGLISH	
C101.1	Read articles of a general kind in magazines and newspapers
C101.2	Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English
C101.3	Comprehend conversations and short talks delivered in English
C101.4	Write short essays of a general kind and personal letters and emails in English.
C101.5	Ability to work with confidence among the team.
C102/ MA8151/ENGINEERING MATHEMATICS I	
C102.1	Find the eigen values and eigen vectors to diagonalise and reduce a matrix to quadratic form.
C102.2	Check the converges, diverges of infinite series
C102.3	Find the solutions of algebraic equations solved by iterative methods gets close to the required solution.
C102.4	Obtain the evaluate and envelopes of a given curves by means of radius and centre of curvature
C102.5	Calculate the maxima and minima value functions of two variables
C103/PH8151/ENGINEERING PHYSICS	
C103.1	Find the eigen values and eigen vectors to diagonalise and reduce a matrix to quadratic form.
C103.2	Check the converges, diverges of infinite series
C103.3	Find the solutions of algebraic equations solved by iterative methods gets close to the required solution.
C103.4	Obtain the evaluate and envelopes of a given curves by means of radius and centre of curvature
C103.5	Calculate the maxima and minima value functions of two variables
C104/CY8151/ENGINEERING CHEMISTRY	
C104.1	Find the eigen values and eigen vectors to diagonalise and reduce a matrix to quadratic form.
C104.2	Check the converges, diverges of infinite series
C104.3	Find the solutions of algebraic equations solved by iterative methods gets close to the required solution.
C104.4	Obtain the evaluate and envelopes of a given curves by means of radius and centre of curvature
C104.5	Calculate the maxima and minima value functions of two variables
C105 / GE8151/ PROBLEM SOLVING AND PYTHON PROGRAMMING	
C105.1	Demonstrate algorithm, flowchart for various programs.
C105.2	Do simple programs using python programming basics.
C105.3	Illustrate programs by using arrays and string functions.
C105.4	Develop simple programs using functions and pointers.
C105.5	Design mini projects with structures.

C106 / GE8152/ ENGINEERING GRAPHICS	
C106.1	Construct engineering curves
C106.2	Sketch all the views of engineering objects in free hand.
C106.3	Draw the projection of points, lines and planes.
C106.4	Draw the projection of solids in any orientation.
C106.5	Develop the section and lateral surfaces of sectioned solids
C107 / GE8161/ PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	
C107.1	Demonstrate algorithm, flowchart for various programs.
C107.2	Do simple programs using python programming basics.
C107.3	Illustrate programs by using arrays and string functions.
C107.4	Develop simple programs using functions and pointers.
C107.5	Design mini projects with structures.
C108/BS8161/Physics and Chemistry Laboratory	
C108.1	The hands on exercises undergone by the students will help them to apply physics principles of optics and thermal physics to evaluate engineering properties of materials.
C108.2	The student will be able to analyze the physical principle involved in various instruments in optics and thermal physics.
C108.3	Students will be able to understand different types of instruments for analyzing compounds.
C108.4	Students will be able to acquire hands-on knowledge in the quantitative analysis of water quality related parameters..
C108.5	Students will be able to think innovatively and also improve the creative skills that are essential for engineering.
Year/Semester: I/II	
C109 / HS8251/ TECHNICAL ENGLISH	
C109.1	Read technical texts and write area- specific texts effortlessly.
C109.2	Listen and comprehend lectures and talks in their area of specialization successfully.
C109.3	Speak appropriately and effectively in varied formal and informal contexts.
C109.4	Write reports and winning job applications.
C109.5	Attain the technical presentation tactics
C110 / MA8251/ Engineering Mathematics - II	
C110.1	Apply the vector concepts of vector calculus in engineering disciplines
C110.2	Apply the knowledge of mathematics in solving higher order differential equations with constant coefficients.
C110.3	To have the basic knowledge of differential equation in typical mechanical fields.
C110.4	Understand the standard techniques of complex variable theory and use them to solve core engineering problems.
C110.5	Evaluate real integrals by applying concept of complex integration.
C111 / PH8251/ Materials Science	
C111.1	The students will have knowledge on the various phase diagrams and their applications

C111.2	The students will acquire knowledge on Fe-Fe_3C phase diagram, various microstructures and alloys
C111.3	The students will get knowledge on mechanical properties of materials and their measurement
C111.4	The students will gain knowledge on magnetic, dielectric and superconducting properties of materials
C111.5	The students will understand the basics of ceramics, composites and nanomaterials
C112 /BE8253/Basic Electrical, Electronics and Instrumentation Engineering	
C112.1	Understand electric circuits and working principles of electrical machines
C112.2	Understand the concepts of various electronic devices
C112.3	Choose appropriate instruments for electrical measurement for a specific application
C112.4	Get knowledge on magnetic and dielectric properties of materials
C112.5	Gain knowledge on classical and quantum electron theories, and energy band structures
C113 /GE8291/Environmental Science and Engineering	
C113.1	Realize the importance of ecosystems and the importance of biodiversity.
C113.2	Describe about Environmental pollution and their effects.
C113.3	Design the techniques which require optimum use of natural resources in future.
C113.4	Understand that Environmental Pollution / problems cannot be solved by mere laws.
C113.5	Explain importance of women and child education and HIV /AIDS.
C114 /GE8292/Engineering Mechanics	
C114.1	Illustrate the vectorial and scalar representation of forces and moments
C114.2	Analyse the rigid body in equilibrium
C114.3	Evaluate the properties of surfaces and solids
C114.4	Calculate dynamic forces exerted in rigid body
C114.5	Determine the friction and the effects by the laws of friction
C115 /GE8261/Engineering Practices Laboratory	
C115.1	Gets exposure regarding Joining operations in engineering materials.
C115.2	Carry out the basic machining operations in engineering materials.
C115.3	Carry out basic home electrical works and appliances.
C115.4	Measure the electrical quantities.
C115.5	Understand basic electronic components.
C116 /BE8261/ Basic Electrical, Electronics and Instrumentation Engineering Laboratory	
C116.1	Ability to determine the speed characteristic of different electrical machines
C116.2	Ability to design simple circuits involving diodes and transistors
C116.3	Ability to use operational amplifiers
C116.4	Understand basic electronic components.
C116.5	Measure the electrical quantities
Year/Semester: II/III	
C201/ MA8353/Transforms and Partial Differential Equations	

C201.1	Understand how to solve the given standard partial differential equations
C201.2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
C201.3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.
C201.4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
C201.5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.
C202/ CE8395/Strength of Materials for Mechanical Engineers	
C202.1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.
C202.2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.
C202.3	Apply basic equation of simple torsion in designing of shafts and helical spring
C202.4	Calculate the slope and deflection in beams using different methods.
C202.5	Analyze and design thin and thick shells for the applied internal and external pressures.
C203/ CE8394 / Fluid Mechanics and Machinery	
C203.1	Apply mathematical knowledge to predict the properties and characteristics of a fluid
C203.2	Can analyse and calculate major and minor losses associated with pipe flow in piping networks.
C203.3	Can mathematically predict the nature of physical quantities
C203.4	Can critically analyse the performance of pumps
C203.5	Can critically analyse the performance of turbines.
	C204/ EC8392 / Digital Electronics
C204.1	Use digital electronics in the present contemporary world
C204.2	Design various combinational digital circuits using logic gates
C204.3	Do the analysis and design procedures for synchronous and asynchronous sequential circuits
C204.4	Use the semiconductor memories and related technology
C204.5	Use electronic circuits involved in the design of logic gates
	C205/ MT8301 / Electrical Machines and Drives
C205.1	Get the basic knowledge about the Electric circuits and transformers.
C205.2	Understand the various types of electrical motors
C205.3	Know about speed control and starting methods DC and induction motors
C205.4	Understand about various types of electrical drives
C205.5	Get exposure with solid state drives
	C206/ MT8302 / Analog Devices and Circuits
C206.1	Apply the various switching devices in electronic circuits.
C206.2	Work with various applications of amplifiers
C206.3	Design various circuits using ICs.

C206.4	Test and measure different parameters available in electronic circuits.
C206.5	Explain the principles of various display devices.
	C207/ CE8381 / Strength of Materials and Fluid Mechanics & Machinery Laboratory
C207.1	Ability to perform Tension test on Solid materials.
C207.2	Ability to perform Torsion test on Solid materials.
C207.3	Ability to perform Hardness test on Solid materials.
C207.4	Ability to perform Compression test on Solid materials.
C207.5	Ability to perform Deformation test on Solid materials.
	C208/ MT8311 / Electrical Machines and Drives Laboratory
C208.1	Ability to do characteristics of different electrical motors.
C208.2	To analyze the performance characteristics of single phase and Polyphase Induction Machines.
C208.3	To understand and analyze the concept of synchronous motor by conducting (or) demonstration through load test.
C208.4	To conduct the load test on single phase transformer for analyzing the performance characteristics.
C208.5	To Perform loading and speed control on DC Shunt Machine
	C209/ HS8381 / Interpersonal Skills/Listening & Speaking
C209.1	Analyze and present the findings of experimental observations in both written and oral format.
C209.2	Participate in group discussions
C209.3	Make effective presentations
C209.4	Participate confidently and appropriately in conversations both formal and informal
C209.5	
Year/Semester: II/IV	
	C210/ MA8452 / Statistics and Numerical Methods
C210.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C210.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C210.3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C210.4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
C210.5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.
	C211/ ME8392 / Manufacturing Technology
C211.1	Understand the various methods of casting processes.
C211.2	Understand the various methods of casting processes.
C211.3	Understand the various methods of machining processes.
C211.4	Understand the various methods of forming and shaping of plastics
C211.5	Understand the various methods of metal forming and powder metallurgy processes.

	C212/ MT8491 / Microprocessors and Microcontrollers
C212.1	Distinguish the feature of the 8085 microprocessor, Hardware Architecture and PIN diagram
C212.2	Demonstrate programming proficiency using the various addressing modes and data transfer instructions of 8085 microprocessor
C212.3	Acquaint the knowledge on architecture and programming of Microcontroller 8051.
C212.4	Illustrate the interrupts handling and demonstrate peripherals applications in different IC and Know about A/D and D/A converters
C212.5	Apply the programming concepts to interface the hardware units with microprocessor and Microcontroller
	C213/ ME8492 / Kinematics of Machinery
C213.1	Discuss the basics of mechanism
C213.2	Calculate velocity and acceleration in simple mechanisms
C213.3	Develop CAM profiles
C213.4	Solve problems on gears and gear trains
C213.5	Examine friction in machine elements
	C214/ MT8401 / Thermodynamics and Heat Transfer
C214.1	Understand the basic concepts associated first law of thermodynamics
C214.2	Understand basic concepts associated with second law of thermodynamics
C214.3	Describing the working of I.C engines and to determine its performance parameters
C214.4	Basic principles of refrigeration, air conditioning and psychometric chart
C214.5	Distinguishing the various modes of heat transfer and its applications
	C215/ MT8411 / MICROPROCESSOR AND MICROCONTROLLERS LABORATORY
C215.1	Write ALP Programmes for fixed and Floating Point and Arithmetic operations
C215.2	Interface different I/Os with processor
C215.3	Generate waveforms using Microprocessors
C215.4	Execute Programs in 8051
C215.5	Design the digital and analog hardware interface for microcontroller-based systems
	C216/ ME8461 / MANUFACTURING TECHNOLOGY LABORATORY
C216.1	Perform the Plain training, taper turning and thread cutting and operation for a given specification.
C216.2	Perform Drilling, Tapping and Reaming operation for a given specification.
C216.3	Produce cutting key ways using shaper machine as per given drawing.
C216.4	Perform milling operations for a given specification.
C216.5	Use different machine tools to manufacturing gears.
	C217/ ME8381 / COMPUTER AIDED MACHINE DRAWING
C217.1	To Know the specifications and symbols of standard machine components used in machine drawing
C217.2	Understand the symbols and methods of indicating it on drawing Surface finish and to understand welding symbols and methods of indicating it on drawing.
C217.3	Preparation of parts and assembly drawing of various machining components.

C217.4	Interpret various tolerances and fits used for component design and to practice the drawings of machine components and simple assemblies using standard CAD packages
C217.5	Sketch drawings manually or using anyone CAD packages for standard machine components and assemblies
	C218/ HS8461 / ADVANCED READING AND WRITING
C218.1	Write different types of essays.
C218.2	Write winning job applications.
C218.3	Read and evaluate texts critically
C218.4	Display critical thinking in various professional contexts
C218.5	Prioritize the ideas relevantly and coherently in writing and speaking
Year/Semester: III/V	
	C301/ EE8552 / Power Electronics
C301.1	Understand the characteristics of various power semi- conductor devices
C301.2	Understand the operation, characteristics and performance parameters of converters
C301.3	Interpret the operation and characteristics of inverters and its related techniques
C301.4	Acquire the knowledge on AC to AC conversion techniques
C301.5	Analyze the operation of DC chopper
	C302/ MT8591 / Sensors and Instrumentation
C302.1	Familiar with various calibration techniques and signal types for sensors
C302.2	Apply the various sensors in the Automotive and Mechatronics applications
C302.3	Describe the working principle and characteristics of force, magnetic and heading sensors.
C302.4	Understand the basic principles of various pressure and temperature, smart sensors.
C302.5	Ability to implement the DAQ systems with different sensors for real time applications.
	C303/ ME8594 / Dynamics of Machines
C303.1	Calculate static and dynamic forces of mechanisms.
C303.2	Calculate the balancing masses and their locations of reciprocating and rotating masses.
C303.3	Compute the frequency of free vibration.
C303.4	Compute the frequency of free vibration.
C303.5	Calculate the speed and lift of the governor and estimate the gyroscopic effect on automobiles, ships and airplanes
	C304/ EC8391 / Control Systems Engineering
C304.1	Identify the various control system components and their representations.
C304.2	Analyze the various time domain parameters.
C304.3	Analysis the various frequency response plots and its system.
C304.4	Apply the concepts of various system stability criterions.
C304.5	Design various transfer functions of digital control system using state variable models.

	C305/ OAI553 / Production Technology of Agricultural machinery
C305.1	Apply the knowledge of various engineering materials in real time applications
C305.2	Apply the machining procedure to achieving the better surface finish in a component
C305.3	Distinguish different types of welding process
C305.4	Explain the need for unconventional machining processes and its classification
C305.5	Write programming for different types of contours and profiles in CNC machines
	C306/ MT8511 / Power Electronics Laboratory
C306.1	Illustrate the characteristics of various power semiconductor devices.
C306.2	Analyze the basic topologies of DC–DC converters
C306.3	Evaluate the performance of AC voltage controller
C306.4	Make use of different PWM techniques for inverters
C306.5	Demonstrate the operation of speed control of dc motor
	C307/ MT8512 / Sensors and Instrumentation Laboratory
C307.1	Generate appropriate design procedure, suitable for signal conversion to interface with computer
C307.2	Design appropriate circuits by using conventional formulas used in signal conditioning and conversion.
C307.3	Implement their design in bread board and test it.
C307.4	Generate appropriate design procedure to obtain a required measurement data for temperature, force, humidity, displacement and sound.
C307.5	Log the data in computer using LABVIEW/ MATLAB/PSILAB.
C307.6	Present data in a clear and meaningful manner.
C307.7	Use transducers to create simple Mechatronics applications using data logging software.
	C308/ ME8481 / Dynamics Laboratory
C308.1	Review the various types of gears, gear trains, kinematic mechanisms, and universal joints.
C308.2	Estimate the mass moment of inertia of single, double rotor systems, spring mass system and transverse vibrations.
C308.3	Inspect the critical speed of shaft under the given load conditions and the gyroscopic effect and couple on motorized gyroscope.
C308.4	Sketch the characteristic curves of Watt, Porter, Proell and Hartnell governors and motion curves for the given cam follower setup.
C308.5	Examine the balancing of rotating masses in dynamic balancing machine.
	C309/ HS8581 / PROFESSIONAL COMMUNICATION
C309.1	Make effective presentations
C309.2	Listen and respond appropriately
C309.3	Participate confidently in Group Discussions
C309.4	Attend Job interviews and be successful in them.
C309.5	Develop adequate soft skills required for the work place.
Year/Semester: III/VI	
	C310/ ME8591 / APPLIED HYDRAULICS AND PNEUMATICS

C310.1	Explain the sources of Hydraulic power
C310.2	Understand the Hydraulic actuators and valves.
C310.3	Discuss the operating principles of hydraulic systems
C310.4	Discuss the operating principles of pneumatic systems
C310.5	Operate and maintain various hydraulic and pneumatic systems in Industrial environment.
	C311/ MT8601 / DESIGN OF MECHATRONICS SYSTEM
C311.1	Understand the basics and key elements of Mechatronics design process
C311.2	Familiar with basic system modelling
C311.3	Understand the concepts of engineering system and dynamic response of the system
C311.4	Realize the concepts of real time interfacing and data acquisition
C311.5	Understanding the concepts of design of Mechatronics system through case studies
	C312/ ME8593 / DESIGN OF MACHINE ELEMENTS
C312.1	Explain the influence of steady and variable stresses in machine component design
C312.2	Apply the concepts of design to shafts, keys and couplings.
C312.3	Apply the concepts of design to temporary and permanent joints
C312.4	Apply the concepts of design to energy absorbing members, bearings and connecting rod.
C312.5	Apply the concepts of design to bearings.
	C313/ MT8602 / INDUSTRIAL AUTOMATION
C313.1	Choose appropriate PLC and explain the architecture, installation procedures and trouble shooting.
C313.2	Develop PLC programs using various functions of PLCs for a given application.
C313.3	Develop PLC programs using various functions of PLCs for a given application.
C313.4	Distinguish DCS, SCADA and PLC and explain the architecture of DCS
C313.5	Describe the controller elements and program methods
	C314/ MG8591 /PRINCIPLES OF MANAGEMENT
C314.1	Understand the evolution of management theories and organization culture.
C314.2	Understand the concepts of planning, types and decision making ability with strategic planning.
C314.3	Understand the concept of organization, departmentalization and activities of HR.
C314.4	Understand individual and group behavior, motivational techniques and leadership qualities with effective communication
C314.5	Understand and control effectively budgetary and non-budgetary items using modern IT tools.
	C315/ GE8075 / Intellectual Property Rights
C315.1	Intellectual Property Rights
C315.2	Predict the practical aspects on registration of IPR
C315.3	Illustrate the treaties and agreements on legislative Act.
C315.4	Illustrate the treaties and agreements on legislative Act.
C315.5	Interpret the emerging issues on IPR

	C316/ MT8611 / APPLIED HYDRAULICS AND PNEUMATICS LABORATORY
C316.1	Select the actuators and valves for the design of fluid power circuits.
C316.2	Design and simulate the fluid power circuits using software tool.
C316.3	Test the simulated output by constructing the fluid power circuits using suitable actuators and valves.
C316.4	Design and test the hydraulic and pneumatic circuits using LABVIEW software
C316.5	Design and simulate the hydraulic and pneumatic circuits using Auto SIM software
	C317/ MT8612 / INDUSTRIAL AUTOMATION LABORATORY
C317.1	Carryout wiring connections and troubleshoot in different PLCs.
C317.2	Develop simple applications using LD, ST and FBD mode of programming
C317.3	Develop simple applications using LD, ST and FBD mode of programming
C317.4	Integrate and control process station with PLC.
C317.5	Develop SCADA application using open source software.
C317.6	Perform speed control on AC motor using VFD and PLC.
	C318/ ME8682 / DESIGN AND FABRICATION PROJECT
C318.1	Design and Fabricate the machine element or the mechanical product.
C318.2	Identify the suitable project, technology to be adopted, rationale behind selection of technology and the objective(s) to be met by the project..
C318.3	Work as a team in planning and execution of project work, preparation of review presentations and project report.
C318.4	Apply relevant and appropriate knowledge of Engineering to achieve identified objectives of the project
C318.5	Create the tangible or intangible and demonstrable output at the end of the project either at our campus or in an industrial environment
Year/Semester: IV/VII	
	C401/ ME8691 / COMPUTER AIDED DESIGN AND MANUFACTURING
C401.1	Explain the 2D and 3D transformations, clipping algorithm, Manufacturing models and Metrics
C401.2	Explain the fundamentals of parametric curves, surfaces and Solids
C401.3	Summarize the different types of Standard systems used in CAD
C401.4	Apply NC & CNC programming concepts to develop part programme for Lathe & Milling Machines
C401.5	Summarize the different types of techniques used in Cellular Manufacturing and FMS
	C402/ MT8701 / ROBOTICS AND MACHINE VISION SYSTEM
C402.1	Express the basic concepts, laws, components and parameters of robots
C402.2	Explain the types of grippers and its functions
C402.3	Evaluate the kinematic calculations and apply Lagrangian and Newton-Euler methods to analyze dynamic characteristics of robots
C402.4	Describing the various programming techniques used in industrial robots
C402.5	Basis of machine vision and apply the concept of image processing

	C403/ MT8791 / EMBEDDED SYSTEM DESIGN
C403.1	Explain the need of embedded systems and their development procedures.
C403.2	Summaries the concepts involved in Real time operating systems
C403.3	Use various tools for developing embedded applications
C403.4	Explain the construction, addressing modes and instructions sets of PIC micro controller.
C403.5	Conduct experiments with I/O systems used in embedded systems.
	C404/ OAN751 / Low Cost Automation
C404.1	Explain low cost automation systems
C404.2	Assembly automation using a hydraulic system
C404.3	Automation using a pneumatic system and PLC
C404.4	Knowledge about different sensors and 8085 microprocessor in automation system
C404.5	Knowledge about feeder, hopper in assembly automation
	C405/ AE8751 / Avionics
C405.1	Ability to built Digital avionics architecture
C405.2	Ability to Design Navigation system
C405.3	Ability to design and perform analysis on air system
C405.4	Integrate avionics systems using data buses.
C405.5	Integrate avionics systems using data buses.
C405.6	Design autopilot for small aircrafts using MATLAB
	C406/ GE8071 / Disaster Management
C406.1	Differentiate the types of disasters, causes and their impact on environment and society
C406.2	Assess vulnerability and various methods of risk reduction measures as well as mitigation
C406.3	Draw the hazard and vulnerability profile of India, Scenarious in the Indian context, Disaster damage assessment and management.
C406.4	Know the Disaster damage assessment and managemen
C406.5	Awareness of institutional processes in the country and to develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live.
C406.6	Complete preparedness, response and recovery in order to reduce the impact of disasters.
	C407/ MT8711 / Computer Aided Design and Manufacturing Laboratory
C407.1	Work in CAD software and Design simple Components
C407.2	Work in CAM software and to program to machine simple components by manually
C407.3	Work in CAM software and to know computer aided part programming
C407.4	Expose students to modern control systems to control the CNC Machine Tool
C407.5	Know the application of various CNC machines like CNC lathe, CNC Vertical Machining center, CNC EDM and CNC wire-cut and studying of Rapid prototyping
	C407/ MT8781 / Robotics Laboratory

C408.1	Know the body type and configurations of industrial robots
C408.2	Deal with mobile robots using different sensors, links and actuators.
C408.3	Deal with mobile robots using different sensors, links and actuators.
C408.4	Clarify various programming techniques used in industrial robots
C408.5	Simulate kinematic and dynamic analysis of robots and estimate the end effectors of robots.
	Year/Semester: IV/VIII
	C409/ MT8801 / AUTOMOTIVE ELECTRONICS
C409.1	Know the importance of emission standards in automobiles.
C409.2	Understand the electronic fuel injection/ignition components and their function.
C409.3	Choose and use sensors and equipment for measuring mechanical quantities, temperature and appropriate actuators.
C409.4	Diagnose electronic engine control systems problems with appropriate diagnostic tools.
C409.5	Analyses the chassis and vehicle safety system.
	C410/ MG8091 / Entrepreneurship Development
C410.1	Explain the Importance of entrepreneurship in economic growth.
C410.2	Analyze opportunities and set up a business.
C410.3	Apply various skills to lead a business.
C410.4	Outline various capital structures and taxation in India
C410.5	Analyze causes of sickness in a business and recommend Corrective measures.
	C411/ GE8076 / Professional Ethics in Engineering
C411.1	To know the concept and importance of Engineering ethics
C411.2	To know about the overall ethical aspects of engineering
C411.3	Able to apply the ethics in Engineering
C411.4	Insight the responsibility in the society
C411.5	Realize engineering ethical issues at global level
	C412/ MT8811 / PROJECT WORK
C412.1	Design, analyze, realize / simulate a physical system by using the technology they learnt during the program.
C412.2	Integrate various systems into one Mechatronics product.
C412.3	Work in a team with confined time duration
C412.4	Disseminate his work both in oral and written format.
C412.5	Apply the engineering knowledge in solving the problem

HOD/MECHT **PRINCIPAL**