2.6.1 Programme and course outcomes for all programmes offered by the institution are stated and displayed on website and communicated to teachers and students

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2.6.1 Programme and course outcomes for all programmes offered by the institution are stated and displayed on website and communicated to teachers and students

The institute is affiliated with Anna University in Chennai, and its course outcomes are properly defined. The institution's vision and mission focus fostering value education through motivated, well-trained faculty in order to prepare students to face globalization's problems.

Programme Outcomes (POs)

Programme outcomes are short statements that define what students should know and be able to achieve after they graduate. These refer to the skills, knowledge, and behaviour that students gain as a result of their participation in the programme. The NBA's programme outcomes for programme accreditation are based on starting capabilities, competence, skills, and other factors. Graduate Attributes are a set of factors that differ from discipline to discipline and level to level.

Programme Specific Outcomes (PSO)

Students should be able to perform PSOs by the time they graduate. The PSOs are unique to each programme. PSOs are written by the program's offering department. In most departments, there are two to four PSOs.

Course Outcomes(CO)

Course outcomes are more specific statements that define what students should know and be able to do at the conclusion of each course/subject. While the POs are responsible for defining departmental outputs, the COs are primarily concerned with the subjects.

The topic handling faculty, along with the department heads and subject experts, frames the course outcomes. Course committee meetings are held on a regular basis, and the institute supports faculty members in achieving these goals through appropriate support systems. This makes it easier to comprehend the course's consequences.

As a result, the course outcomes are directly and quantitatively analysed, and they are linked to the program's overall outcomes as well as program-specific outcomes. The programme results are mapped to each course's course outcomes, with a level of emphasis of strongly correlated (3), moderately correlated (2), and lightly correlated (1).

The College has clearly stated learning outcomes of the Programs and Courses offering in the institution and the following mechanism is followed to communicate the learning outcomes to the teachers and students.

- Hard Copy of the Syllabi and course outcome is available in the college/departments for ready reference to the students and Faculty.
- The course outcomes are communicated by individual faculty to the students in classrooms, displayed in lesson plan, log book and course file.
- The PO, PSO and CO's are incorporated and the Soft Copy of Curriculum and Learning Outcomes of Programs and Courses are also uploaded to the Institution website which can be accessed by all the stakeholders namely Faculty, Students, Industry and Alumni.

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DEPARTMENT OF AERONAUTICAL ENGINEERING

PROGRAMME OUTCOMES

PO1	Ability to solve the engineering problems of mathematics, science and engineering
PO2	An engineering acumen in identifying, formulating, analyzing and solving complex engineering problems.
PO3	Developing processes, solutions to the problems which are safe socially, culturally and environmentally.
PO4	Ability to model, analyze and simulate operations of aircraft components and parts.
PO5	Capability of exhibiting sound theoretical and practical knowledge in core domains like aircraft structures, aerodynamics and propulsion and are able to solve problems related to airflow over fixed and rotary wing aircrafts.
PO6	Understanding of the impact of engineering solutions in a global, economic, environmental, and societal context
PO7	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
PO8	Commitment to professional ethics and responsibilities and norms as prescribed by the Aviation bodies such as DGCA
PO9	Ability to work in team and have practical exposure in modeling of UAV, hovercrafts.
PO10	Ability to communicate effectively with the aerospace community using reports, presentations and documentations.
PO11	Ability to manage the projects in various aerospace fields of structure, propulsion, avionics.
PO12	A readiness to engage in lifelong learning and understanding of contemporary issues in aviation industry.

Programme Specific Outcomes – Aeronautical Engineering

PSO 1	Apply fundamental principles of Aerodynamics, Structures, Propulsion, Materials, and Avionics to provide solutions to aerospace and non-aerospace industrial problems.
PSO 2	Demonstrate problem solving ability and hands-on skills to enter careers in the design, manufacturing, testing, or maintenance of aeronautical systems.
PSO 3	Demonstrate an ability to use CAE packages and simulation language skills to solve practical, design and analysis problems using the aeronautical engineering discipline.

HOD/AERO
Head of the Department
Aeronautical Engineering
M.A.M.School of Engineering
Siruganur,Trichy - 621 105.

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DEPARTMENT OF AERONAUTICAL 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
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	
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
C108.2	The student will be able to analyze the physical principle involved in various
C108.3	Students will be able to understand different types of instruments for analyzing
C108.4	Students will be able to acquire hands-on knowledge in the quantitative
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
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
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
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/ ME8392 / MANUFACTURING TECHNOLOGY	
C202.1	The Students can able to use different manufacturing process and use this in industry for component production
C202.2	Ability to use this in industry for component production
C202.3	Knowledge on moulding fabrication
C202.4	Knowledge on heat treatment
C202.5	Knowledge on production processes
C203/ AE8301 / AERO ENGINEERING THERMODYNAMICS	
C203.1	Able to relate laws of thermodynamics to jet engine components.
C203.2	Understands principle operation of piston engine and jet engines.
C203.3	Able to identify efficient cycle of air and jet engines.
C203.4	Capable to illustrate condition of working medium.
C203.5	Eligible to recognize and calculate heat transfer in complex systems involving several heat transfer mechanisms.
C204/ CE8394 / FLUID MECHANICS AND MACHINERY	
C204.1	Apply mathematical knowledge to predict the properties and characteristics of a fluid.
C204.2	Can analyse and calculate major and minor losses associated with pipe flow in piping networks.
C204.3	Can mathematically predict the nature of physical quantities
C204.4	Can critically analyse the performance of pumps
C204.5	Can critically analyse the performance of turbines
C205/ CE8395 / STRENGTH OF MATERIALS FOR MECHANICAL ENGINEERS	
C205.1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.
C205.2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.
C205.3	Apply basic equation of simple torsion in designing of shafts and helical spring
C205.4	Calculate the slope and deflection in beams using different methods.

C205.5	Analyze and design thin and thick shells for the applied internal and external pressures.
C206/ AE8302 / ELEMENTS OF AERONAUTICAL ENGINEERING	
C206.1	Learn the history of aircraft & developments over the years
C206.2	Ability to identify the types & classifications of components and control systems
C206.3	Understand the basic concepts of flight & Physical properties of Atmosphere
C206.4	An ability to differentiate the types of fuselage and constructions
C206.5	Different types of Engines and principles of Rocket
C207/ CE8381 / STRENGTH OF MATERIALS AND FLUID MECHANICS & MACHINERY LABORATORY	
C207.1	Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.
C207.2	Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment.
C207.3	Apply basic equation of simple torsion in designing of shafts and helical spring
C207.4	Calculate the slope and deflection in beams using different methods.
C207.5	Analyze and design thin and thick shells for the applied internal and external pressures.
C208/ AE8311 / THERMODYNAMICS LABORATORY	
C208.1	Ability to perform test on diesel/petrol engine
C208.2	Ability to explain the characteristics of the diesel/Petrol engine
C208.3	Ability to determine the properties of the fuels.
C208.4	Ability to understand engine performance
C208.5	Ability to perform COP testing
C209/ HS8381 / INTERPERSONAL SKILLS/LISTENING & SPEAKING	
C209.1	Listen and respond appropriately.
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	Improve general and academic listening skills
Year/Semester: II/IV	
C210/ MA8491 / NUMERICAL METHODS	
C210.1	Understand the basic concepts and techniques of solving algebraic and transcendental equations.
C210.2	Appreciate the numerical techniques of interpolation and error approximations in various intervals in real life situations.
C210.3	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/ AE8401 / AERODYNAMICS - I	
C211.1	An ability to apply airfoil theory to predict airfoil performance

C211.2	Analyze and optimize wing performance
C211.3	A knowledge of incompressible flow
C211.4	A knowledge of subsonic wing theory
C211.5	Apply propeller theory to predict blade performance
C212/ AE8402 / AIRCRAFT SYSTEMS AND INSTRUMENTS	
C212.1	Compare the features of various flight control systems
C212.2	Describe the principle and working of different aircraft systems
C212.3	Analyze the performance of various aircraft engine systems.
C212.4	Acquire and interpret data from various aircraft instruments.
C212.5	Identify the various cockpit controls.
C213/ PR8451 / MECHANICS OF MACHINES	
C213.1	Understand the principles in the formation of mechanisms and their kinematics.
C213.2	Understand the construction features of Gears and Gear Trains.
C213.3	Understand the effect of friction in different machine elements.
C213.4	Understand the importance of balancing.
C213.5	Understand the importance of Governors and Gyroscopic effects.
C214/ AE8403 / AIRCRAFT STRUCTURES - I	
C214.1	Ability to perform linear static analysis of determinate and indeterminate aircraft structural components
C214.2	Ability to design the component using different theories of failure
C214.3	Calculate the response of statically indeterminate structures under various loading conditions.
C214.4	Calculate the reactions of structures using strain energy concept.
C214.5	Create a structure to carry the given load.
C215/ AE8404 / PROPULSION – I	
C215.1	To be able to apply control volume and momentum equation to estimate the forces produced by aircraft propulsion systems
C215.2	To be able to describe the principal figures of merit for aircraft engine
C215.3	To be able to describe the principal design parameters and constraints that set the performance of gas turbine engines.
C215.4	To apply ideal and actual cycle analysis to a gas turbine engine to relate thrust and fuel burn to component performance parameters
C215.5	Understanding the workings of multistage compressor or turbine, and to be able to use velocity triangles and the Euler Turbine Equation to estimate the performance of a compressor or turbine stage.
C216/ ME8381 / COMPUTER AIDED MACHINE DRAWING	
C216.1	Follow the drawing standards, Fits and Tolerances
C216.2	Re-create part drawings, sectional views and assembly drawings as per standards
C216.3	Develop the part model for any machine components by using modeling software.
C216.4	Develop the assembly model for machine components by using modeling software.
C216.5	Develop the program code for CNC machines for simulation
C217/ AE8411 / AERODYNAMICS LABORATORY	
C217.1	Describe the fundamental aerodynamic and geometrical properties related to external flows over airfoils, wings, and bluff bodies
C217.2	Calculate the aerodynamic forces and moments experienced by airfoils, wings and

	bluff bodies.
C217.3	Use thin aerofoil theory to evaluate the performance of thin airfoils and the effects of angle of attack and camber.
C217.4	Use wind tunnel instrumentation to measure flow velocity and lift and drag.
C217.5	Visualize the flow and pressure distribution over 2D and 3D bodies by water flow and smoke methods.
Year/Semester: III/V	
C301/ AE8501 / FLIGHT DYNAMICS	
C301.1	Know about the forces and moments that are acting on an aircraft, the different types of drag, drag polar, ISA, variation of thrust, power, SFC with velocity and altitude.
C301.2	Have understanding about performance in level flight, minimum drag and power required, climbing, gliding and turning flight, v-n diagram and load factor.
C301.3	Knowledge about degrees of stability, stick fixed and stick free stability, stability criteria, effect of fuselage and CG location, stick forces, aerodynamic balancing.
C301.4	Understanding about lateral control, rolling and yawing moments, static directional stability, rudder and aileron control requirements and rudder lock.
C301.5	Understanding about dynamic longitudinal stability, stability derivatives, modes and stability criterion, lateral and directional dynamic stability.
C302/ AE8502 / AIRCRAFT STRUCTURES - II	
C302.1	Ability to understand loads acting an aircraft.
C302.2	Ability to identify& resolve the structural design& its limitations .
C302.3	Ability to improvise distribution their loads on aircraft member with safer limits.
C302.4	Ability to understand the design of low weight to high strength panel member.
C302.5	Ability to analyze the aircraft real structural components such as wings and fuselage..
C303/ AE8503 / AERODYNAMICS – II	
C303.1	Calculate the compressible flow through a duct of varying cross section.
C303.2	Use quasi one-dimensional theory to analyze compressible flow problems.
C303.3	Estimate fluid properties in Rayleigh and Fanno type flows.
C303.4	Estimate the properties across normal and oblique shock waves.
C303.5	Predict the properties of hypersonic flows.
C304/ AE8504 / PROPULSION – II	
C304.1	Understanding ramjet and hypersonic air breathing propulsion systems.
C304.2	To get familiarity in rocket propulsion systems.
C304.3	Knowing the applications and principles of liquid and solid-liquid propulsion systems.
C304.4	To gain knowledge about the advanced propulsion technique used for interplanetary mission.
C304.5	Familiarize students with the principle and applications of liquid propulsion systems.
C305/ AE8505 / CONTROL ENGINEERING	
C305.1	Ability to apply mathematical knowledge to model the systems and analyse the frequency domain
C305.2	Ability to check the stability of the both time and frequency domain

C305.3	Ability to solve simple pneumatic, hydraulic and thermal systems, Mechanical and electrical component analogies based problems.
C305.4	Ability to solve the Block diagram representation of control systems, Reduction of block diagrams, Signal flow graph and problems based on it.
C305.5	Ability to understand the digital control system, Digital Controllers and Digital PID Controllers.
C306/ OAI553 / PRODUCTION TECHNOLOGY OF AGRICULTURAL MACHINE	
C306.1	Apply the knowledge of various engineering materials in real time applications
C306.2	Apply the machining procedure to achieving the better surface finish in a component
C306.3	Distinguish different types of welding process
C306.4	Explain the need for unconventional machining processes and its classification
C306.5	Write programming for different types of contours and profiles in CNC machines
C307/ AE8511 / AIRCRAFT STRUCTURES LABORATORY	
C307.1	students can understand the behavior of materials subjected to various types of loadings
C307.2	Students will be in a position to fabricate a composite laminates
C307.3	Ability to perform Shear
C307.4	Ability to perform Vibration test on metabolic
C307.5	Ability to fabricate composite laminates
C308/ AE8512 / PROPULSION LABORATORY	
C308.1	Capable to identify components and information of piston and gas turbine engine.
C308.2	Able to analyse behaviour of flow through ducts and jet engine components.
C308.3	Ability to visualize flow phenomenon in supersonic flow.
C308.4	Recognizes performance parameters of rocket propellants.
C308.5	To be able to distinguish subsonic and supersonic flow characteristics.
C309/ HS8581 / PROFESSIONAL COMMUNICATION	
C309.1	Make effective presentations
C309.2	Participate confidently in Group Discussions.
C309.3	Attend job interviews and be successful in them.
C309.4	Develop adequate Soft Skills required for the workplace
C309.5	Successfully answer questions in Interviews.
Year/Semester: III/VI	
C310/ AE8601 / FINITE ELEMENT METHODS	
C310.1	Write flow chart of finite element steps and understand the convergence of the problem
C310.2	Solve stiffness matrix for bar, beam and frame problems using suitable boundary condition
C310.3	Plane stress and plane strain condition are used to understand 2d structures.
C310.4	Modelling of 2d and 3d structures using isoparametric elements
C310.5	Apply the concepts of finite element methods to solve fluid flow and heat transfer problems.
C311/ AE8602 / EXPERIMENTAL AERODYNAMICS	
C311.1	Knowledge on measurement techniques in aerodynamic flow.
C311.2	Acquiring basics of wind tunnel measurement systems

C311.3	Specific instruments for flow parameter measurement like pressure, velocity
C311.4	Use measurement techniques involved in Aerodynamic testing.
C311.5	Analyze the model measurements, Lift and drag measurements through various techniques and testing of different models
C312/ AE8603 / COMPOSITE MATERIALS AND STRUCTURES	
C312.1	Understanding the mechanics of composite materials
C312.2	Ability to analyse the laminated composites for various loading eases
C312.3	Knowledge gained in manufacture of composites.
C312.4	Should analyze sandwich and laminated plates
C312.5	Should be able to construct and analysis different composite technique
C313/ AE8604 / AIRCRAFT DESIGN	
C313.1	Work in a multidisciplinary environment involving the integration of engineering practices in such subjects as aerodynamics, structures, propulsion, and flight mechanics
C313.2	Initiate the preliminary design of an aircraft starting from data collection to satisfy mission specifications;
C313.3	To get familiarized with the estimation of geometric and design parameters of an airplane
C313.4	Understanding the procedure involved in weight estimation, power plant selection, estimation of the performance parameters, stability aspects, design of structural components of the airplane, stability of structural elements, estimation of critical loads etc.
C313.5	Initiate the design of a system, component, or process to meet requirements for aircraftsystems;
C314/ AE8605 / EXPERIMENTAL STRESS ANALYSIS	
C314.1	Knowledge of stress and strain measurements in loaded components.
C314.2	Acquiring information's the usage of strain gauges and photo elastic techniques of measurement
C314.3	Formulate and solve general three dimensional problems of stress-strain analysis especially fundamental problems of elasticity.
C314.4	Analyze the strain gauge data under various loading condition by using gauge rosette method
C314.5	Experimentally evaluate the location and size of defect in solid and composite materials by using various Non-destructive Testing methods.
C315/ GE8075 / Intellectual Property Rights	
C315.1	Ability to manage Intellectual Property portfolio to enhance the value of the firm.
C315.2	Identify different types of Intellectual Properties (IPs), the right of ownership, scope ofprotection as well as the ways to create and to extract value from IP.
C315.3	Recognize the crucial role of IP in organizations of different industrial sectors for the purposes of product and technology development.
C315.4	Be able to anticipate and subject to critical analysis arguments relating to the development and reform of intellectual property right institutions and their likely impact on creativity and innovation.
C315.5	Be able to demonstrate a capacity to identify, apply and assess ownership rights and marketing protection under intellectual property law as applicable to information,

	ideas, new products and product marketing
C316/AE8611 / AERO ENGINE AND AIRFRAME LABORATORY	
C316.1	Ability to maintain and repair the aero engines.
C316.2	Ability to repair aero engines
C316.3	Ability to repair fabric material
C316.4	Ability to repair riveted material
C316.5	Knowledge on welding
C317/AE8612 / COMPUTER AIDED SIMULATION LABORATORY	
C317.1	Ability to Mesh various geometries and to do grid independence study.
C317.2	Simulate and analyze fluid flow for internal and external flow problems.
C317.3	Analyze the basic mechanism of different structural elements behavior.
C317.4	Analyze the variation of mechanical properties over a composite beam.
C317.5	Analyze the apparent stress distribution over structural component
C318/AE8613 / AIRCRAFT DESIGN PROJECT - I	
C318.1	Upon completion of the Aircraft Design Project I students will be in a position to design aircraft
C318.2	Demonstrate the performance of the design.
C318.3	Ability to perform design calculation
C318.4	Ability to perform computational analysis
C318.5	Knowledge on aircraft design
Year/Semester: IV/VII	
C401/GE8077 / TOTAL QUALITY MANAGEMENT	
C401.1	Describe the dimensional barrier regarding Quality
C401.2	Summarize the Total quality principles.
C401.3	Demonstrate the tools utilization for quality improvement.
C401.4	Discover the new decision of principle in real time projects.
C401.5	Analyze the various types of techniques are used to measure quality.
C402/OAN751 / LOW COST AUTOMATION	
C402.1	Upon completion of this course, the students can able to do low cost automation systems
C402.2	Students can do some assembly automation
C402.3	Can able to do automation using hydraulics
C402.4	Can able to do automation using pneumatics
C402.5	Students can able to do automation in electronics
C403/AE8751 / AVIONICS	
C403.1	Ability to built Digital avionics architecture
C403.2	Ability to Design Navigation system
C403.3	Ability to design and perform analysis on air system.
C403.4	Integrate avionics systems using data buses.
C403.5	Analyze the performance of various cockpit display technologies.
C404/ME8093/ COMPUTATIONAL FLUID DYNAMICS	
C404.1	Derive the governing equations and boundary conditions for Fluid dynamics
C404.2	Analyze Finite difference and Finite volume method for Diffusion
C404.3	Analyze Finite volume method for Convective diffusion
C404.4	Analyze Flow field problems

C404.5	Explain the Turbulence models and Mesh generation techniques
C405/GE8071/ DISASTER MANAGEMENT	
C405.1	Ability to study varies types of disaster and dos and don'ts during various types of disasters
C405.2	Ability to understand the approaches to disaster risk reduction
C405.3	Ability to understand inter-relationship between disasters and development
C405.4	Able to study the disaster risk management in India
C405.5	Able to impart knowledge , disaster management: applications and case studies and field works
C406/ ME8097/ NON DESTRUCTIVE TESTING AND EVALUATION	
C406.1	Understand the concepts of Non Destructive Testing and Testing Methods
C406.2	Identify and analyze the product defects by various NDT methods
C406.3	Define and characterize the functions of NDT methods
C406.4	Demonstrate a methodical approach of the usage of NDT methods
C406.5	Acquire skills needed for selection of appropriate NDT technique(s) for new inspection jobs
C407/AE8711/ AIRCRAFT SYSTEMS LABORATORY	
C407.1	Ability to maintain aero airframe systems
C407.2	Ability to repair aero Airframes
C407.3	Ability to perform leveling
C407.4	Ability to perform leakage test on fuel lines
C407.5	Ability to perform brake test
C408/AE8712/ FLIGHT INTEGRATION SYSTEMS AND CONTROL LABORATORY	
C408.1	Ability to understand digital electronics circuits.
C408.2	Ability to use microprocessor in Flight control
C408.3	Ability to perform stability analysis
C408.4	Knowledge on basic electronics circuits
C408.5	Knowledge on fault tolerant computers
C409/AE8713/ AIRCRAFT DESIGN PROJECT - II	
C409.1	Ability to design an aircraft
C409.2	Ability to demonstrate the performance of the design.
C409.3	Ability to perform design calculation
C409.4	Ability to perform computational analysis
C409.5	Knowledge on aircraft design
Year/Semester: IV/VIII	
C410/ AE8013 / ROCKETS AND MISSILES	
C410.1	To be able to know about the current scenario of rockets and missiles.
C410.2	To gain knowledge about the trajectory motion of rockets and missiles.
C410.3	Gaining information on aerodynamic characteristics of rockets and missiles.
C410.4	To expand the ability to design the staging and control of own rockets.
C410.5	Basic knowledge about the propulsion systems and materials used in rockets and missiles.
C411/ GE8076 / PROFESSIONAL ETHICS IN ENGINEERING	
C411.1	Understand the awareness on engineering ethics and human values.
C411.2	Install moral and social values and loyalty to the society.

C411.3	Able to appreciate the rights of others.
C411.4	Know the responsible experimenters and knowledge on balance outlook on law.
C411.5	Understand the safety, responsibilities and rights.
C412/ AE8811 / PROJECT WORK	
C412.1	Identify the various components of mechanical systems.
C412.2	Understand the basic concepts of design and manufacturing.
C412.3	Design, analysis and fabricate the mechanical systems.
C412.4	Identify the applications of mechanical systems.
C412.5	Innovate and apply for real time applications.

HOD/AERO

Head of the Department
Aeronautical Engineering
M.A.M.School of Engineering
Siruganur,Trichy - 621 105.

PRINCIPAL

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M.A.M. SCHOOL OF ENGINEERING
SIRIGANUR, TIRUCHIRAPPALLI-621 105.

Department of Computer Science and Engineering

Programme Outcomes

PO1	Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	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.
PO4	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.
PO5	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.
PO6	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.
PO7	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	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.
PO11	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.
PO12	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.

Programme Specific Outcomes –Computer Science and Engineering

PSO1	To analyze, design and develop computing solutions by applying foundational concepts of Computer Science and Engineering.
PSO2	To apply software engineering principles and practices for developing quality software for scientific and business applications.
PSO3	To adapt to emerging Information and Communication Technologies (ICT) to innovate ideas and solutions to existing/novel problems.

K. Sathish Kumar
HOD/CSE
Head of the Department
Department of Computer Science & Engineering
M.A.M. School of Engineering
Siruganur, Tiruchirappalli - 621 105.

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PRINCIPAL
M.A.M. SCHOOL OF ENGINEERING
SIRIGANUR, TIRUCHIRAPPALLI-621 105.

Department of Computer Science and 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	Discuss the logical solutions through Flowcharts, Algorithms and Pseudo code
C105.2	Explain the syntax for python programming constructs.
C105.3	Compute the flow of the program to obtain the programmatic solution.
C105.4	Examine the programs with sub problems using 'Python' language and Apply python programs to read and write data from/to files.
C105.5	Compute the compound data using Python lists, tuples, and dictionaries
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	Write, test, and debug simple Python programs.
C107.2	Implement Python programs with conditionals and loops.
C107.3	Develop Python programs step-wise by defining functions and calling them.
C107.4	Use Python lists, tuples, dictionaries for representing compound data.
C107.5	Read and write data from/to files in Python.
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 /PH8252 / Physics for Information Science	
C111.1	Gain knowledge on classical and quantum electron theories, and energy band structues,
C111.2	Acquire knowledge on basics of semiconductor physics and its applications in various

	devices,
C111.3	Get knowledge on magnetic properties of materials and their applications in data storage,
C111.4	Have the necessary understanding on the functioning of optical materials for opto electronics,
C111.5	Understand the basics of quantum structures and their applications in carbon electronics.
C112/BE8255/Basic Electrical, Electronics and Measurement Engineering	
C112.1	Ability to determine the speed characteristic of different electrical machines
C112.2	Ability to design simple circuits involving diodes and transistors
C112.3	Ability to use operational amplifiers
C112.4	Understand basic electronic components.
C112.5	Measure the electrical quantities
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/CS8251/Programming in C	
C114.1	Develop simple applications in C using basic constructs
C114.2	Design and implement applications using arrays and strings
C114.3	Develop and implement applications in C using functions and pointers.
C114.4	Develop applications in C using structures.
C114.5	Design applications using sequential and random access file processing.
CS115/ 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/CS8261/C Programming Laboratory	
C116.1	Develop C programs for simple applications making use of basic constructs.
C116.2	Apply the concept of conditionals and loops in C programs.
C116.3	Develop the C programs with arrays and strings.
C116.4	Apply the concept of functions, recursion in C programs
C116.5	Analyze the concept of pointers, and structures in C.
Year/Semester: II/III	
C201/ MA8351/Discrete Mathematics	
C201.1	Have knowledge of the concepts needed to test the logic of a program.
C201.2	Have an understanding in identifying structures on many levels.
C201.3	Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.
C201.4	Be aware of the counting principles.
C201.5	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.
C202/CS8351/Digital Principles And System Design	
C202.1	Simplify Boolean functions using KMap
C202.2	Design and Analyze Combinational and Sequential Circuits
C202.3	Implement designs using Programmable Logic Devices
C202.4	Write HDL code for combinational and Sequential Circuits

C202.5	Apply Programmable Logic towards memory management.
C203/CS8391/Data Structures	
C203.1	Implement abstract data types for linear data structures.
C203.2	Apply the different linear and non-linear data structures to problem solutions.
C203.3	Critically analyze the various sorting algorithms.
C203.4	Solve searching, sorting and hashing techniques in data structures.
C203.5	Apply various algorithms in graph.
C204/CS8392/Object Oriented Programming	
C204.1	Develop Java programs using OOP principles.
C204.2	Develop Java programs with the concepts inheritance and interfaces.
C204.3	Build Java applications using exceptions and I/O streams.
C204.4	Develop Java applications with threads and generics classes.
C204.5	Develop interactive Java programs using swings.
C205/ EC8395/Communication Engineering	
C205.1	Ability to comprehend and appreciate the significance and role of this course in the present contemporary world.
C205.2	Apply analog and digital communication techniques.
C205.3	Use data and pulse communication techniques.
C205.4	Analyze Source and Error control coding.
C205.5	Implement the source coding techniques.
C206/ CS8381/ Data Structures Laboratory	
C206.1	Write functions to implement linear and non-linear data structure operations
C206.2	Suggest appropriate linear / non-linear data structure operations for solving a given problem
C206.3	Appropriately use the linear / non-linear data structure operations for a given problem
C206.4	Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval
C206.5	Design new solutions for programming problems or improve existing code using learned algorithms and data structures.
C207/CS8383/ Object Oriented Programming Laboratory	
C207.1	Develop and implement Java programs for simple applications that make use of classes, packages and interfaces.
C207.2	Develop and implement Java programs with arraylist, exception handling and multithreading .
C207.3	Design applications using file processing, generic programming and event handling.
C207.4	Express the Engineering activities with effective presentation and report.
C207.5	Interpret the findings with appropriate technological / research citation.
C208/CS8382/Digital Systems Laboratory	
C208.1	Implement simplified combinational circuits using basic logic gates.
C208.2	Implement combinational circuits using MSI devices.
C208.3	Implement sequential circuits like registers and counters.
C208.4	Simulate combinational and sequential circuits using HDL.
C208.5	Demonstrate simple digital system.
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	Interview skills development
Year/Semester: II/IV	
C210/ MA8212/Probability and Queuing Theory	
C210.1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
C210.2	Understand the basic concepts of one and two dimensional random variables and apply in

	engineering applications.
C210.3	Apply the concept of random processes in engineering disciplines.
C210.4	Acquire skills in analyzing queueing models.
C210.5	Understand and characterize phenomenon which evolve with respect to time in a probabilistic manner.
C212/CS8491/Computer Architecture	
C211.1	Understand the basics structure of computers, operations and instructions.
C211.2	Design arithmetic and logic unit.
C211.3	Understand pipelined execution and design control unit.
C211.4	Understand parallel processing architectures.
C211.5	Understand the various memory systems and I/O communication.
C212/CS8492/Database Management Systems	
C212.1	Classify the modern and futuristic database applications based on size and complexity.
C212.2	Map ER model to Relational model to perform database design effectively.
C212.3	Write queries using normalization criteria and optimize queries.
C212.4	Compare and contrast various indexing strategies in different database systems
C212.5	Appraise how advanced databases differ from traditional databases.
C213/CS8451/Design and Analysis of Algorithms	
C213.1	Design algorithms for various computing problems.
C213.2	Analyze the time and space complexity of algorithms.
C213.3	Critically analyze the different algorithm design techniques for a given problem.
C213.4	Modify existing algorithms to improve efficiency.
C213.5	Describe how scientific problems can be solved using iterative method and how to cope with limitations of algorithm power.
C214/CS8493/ Operating Systems	
C214.1	Analyze various scheduling algorithms.
C214.2	Understand deadlock, prevention and avoidance algorithms.
C214.3	Compare and contrast various memory management schemes.
C214.4	Understand the functionality of file systems and Perform administrative tasks on Linux Servers.
C214.5	Compare iOS and Android Operating Systems.

C215/ CS8494/Software Engineering	
C215.1	Identify the key activities in managing a software project.
C215.2	Compare different process models.
C215.3	Concepts of requirements engineering and Analysis Modeling.
C215.4	Apply systematic procedure for software design and deployment.
C215.5	Manage project schedule, estimate project cost and effort required.
C216/ CS8481/Database Management Systems Laboratory	
C216.1	Use typical data definitions and manipulation commands.
C216.2	Design applications to test Nested and Join Queries.
C216.3	Implement simple applications that use Views
C216.4	Implement applications that require a Front-end Tool
C216.5	Critically analyze the use of Tables, Views, Functions and Procedures
C217/ CS8461/Operating Systems Laboratory	
C217.1	Compare the performance of various CPU Scheduling Algorithms
C217.2	Implement Deadlock avoidance and Detection Algorithms
C217.3	Implement Semaphores and Create processes and implement IPC
C217.4	Analyze the performance of the various Page Replacement Algorithms
C217.5	Implement File Organization and File Allocation Strategies.

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	Develop communication skills.
Year/Semester: III/V	
C301/MA8551/Algebra and Number Theory	
C301.1	Apply the basic notions of groups, rings, fields which will then be used to solve related problems.
C301.2	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts.
C301.3	Demonstrate accurate and efficient use of advanced algebraic techniques.
C301.4	Demonstrate their mastery by solving non - trivial problems related to the concepts, and by proving simple theorems about the, statements proven by the text.
C301.5	Apply integrated approach to number theory and abstract algebra, and provide a firm basis for further reading and study in the subject.
C302/CS8591/Computer Networks	
C302.1	Understand the basic layers and its functions in computer networks.
C302.2	Evaluate the performance of a network.
C302.3	Understand the basics of how data flows from one node to another.
C302.4	Analyze and design routing algorithms and Design protocols for various functions in the network.
C302.5	Understand the working of various application layer protocols.
C303/EC8691/Microprocessors and Microcontrollers	
C303.1	Understand and execute programs based on 8086 microprocessor.
C303.2	Design Memory Interfacing circuits.
C303.3	Design and interface I/O circuits.
C303.4	Design and implement 8051 microcontroller based systems.
C303.5	Build an assembly language program for interfacing.
C304/CS8301/Theory of Computation	
C304.1	Construct automata, regular expression for any pattern.
C304.2	Write Context free grammar for any construct.
C304.3	Design Turing machines for any language.
C304.4	Propose computation solutions using Turing machines.
C304.5	Derive whether a problem is decidable or not.
C305/CS8592/Object Oriented Analysis and Design	
C305.1	Express software design with UML diagrams
C305.2	Design software applications using OO concepts.
C305.3	Identify various scenarios based on software requirements
C305.4	Transform UML based software design into pattern based design using design patterns
C305.5	Understand the various testing methodologies for OO software
C306/OMD551/ Basics of Bio Medical Instrumentation	
C306.1	Analyze and evaluate the effect of different diagnostic and therapeutic methods,their riskpotential, physical principles, opportunities and possibilities for different medical procedures
C306.2	Measure the various electrical signals from human system
C306.3	Examine biochemical and various physiological information.
C306.4	Describe the working of units which will help to restore normal functioning.
C306.5	Understand the position of biomedical instrumentation in modern Hospital care
C307/ EC8681/ Microprocessors and Microcontrollers Laboratory	
C307.1	Write ALP.Programmes for fixed and Floating Point and Arithmetic operations

C307.2	Interface different I/Os with processor
C307.3	Generate waveforms using Microprocessors
C307.4	Execute Programs in 8051
C307.5	Explain the difference between simulator and Emulator
	C308/ CS8582/Object Oriented Analysis and Design Laboratory
C308.1	Perform OO analysis and design for a given problem specification.
C308.2	Identify and map basic software requirements in UML mapping.
C308.3	Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns
C308.4	Test the compliance of the software with the SRS.
C308.5	Map the object oriented design to the developed code.
	C309/ CS8581/ Networks Laboratory
C309.1	Implement various protocols using TCP and UDP.
C309.2	Compare the performance of different transport layer protocols.
C309.3	Use simulation tools to analyze the performance of various network protocols.
C309.4	Analyze various routing algorithms.
C309.5	Implement error correction codes.
	Year/Semester: III/VI
	C310/CS8651/Internet Programming
C310.1	Construct a basic website using HTML and Cascading Style Sheets.
C310.2	Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms.
C310.3	Develop server side programs using Servlets and JSP.
C310.4	Construct simple web pages in PHP and to represent data in XML format.
C310.5	Use AJAX and web services to develop interactive web applications
	C311/CS8691/Artificial Intelligence
C311.1	Use appropriate search algorithms for any AI problem
C311.2	Represent a problem using first order and predicate logic
C311.3	Provide the apt agent strategy to solve a given problem
C311.4	Design software agents to solve a problem
C311.5	Design applications for NLP that use Artificial Intelligence.
	C312/CS8310/Mobile Computing
C312.1	Explain the basics of mobile telecommunication systems
C312.2	Illustrate the generations of telecommunication systems in wireless networks
C312.3	Determine the functionality of MAC, network layer and Identify a routing protocol for a given Ad hoc network
C312.4	Explain the functionality of Transport and Application layers
C312.5	Develop a mobile application using android/blackberry/ios/Windows SDK
	C313/CS8311/Compiler Design
C313.1	Understand the different phases of compiler and Design a lexical analyzer for a sample language.
C313.2	Apply different parsing algorithms to develop the parsers for a given grammar.
C313.3	Understand syntax-directed translation and run-time environment.
C313.4	Learn to implement code optimization techniques and a simple code generator.
C313.5	Design and implement a scanner and a parser using LEX and YACC tools.
	C314/CS8312/Distributed Systems
C314.1	Elucidate the foundations and issues of distributed systems
C314.2	Understand the various synchronization issues and global state for distributed systems.
C314.3	Understand the Mutual Exclusion and Deadlock detection algorithms in distributed systems
C314.4	Describe the agreement protocols and fault tolerance mechanisms in distributed systems.
C314.5	Describe the features of peer-to-peer and distributed shared memory systems.

C315/ GE8075/ Intellectual Property Rights	
C315.1	Ability to manage Intellectual Property portfolio to enhance the value of the firm.
C315.2	Identify different types of Intellectual Properties (IPs), the right of ownership, scope ofprotection as well as the ways to create and to extract value from IP.
C315.3	Recognize the crucial role of IP in organizations of different industrial sectors for the purposes of product and technology development.
C315.4	Be able to anticipate and subject to critical analysis arguments relating to the development and reform of intellectual property right institutions and their likely impact on creativity and innovation.
C315.5	Be able to demonstrate a capacity to identify, apply and assess ownership rights and marketing protection under intellectual property law as applicable to information, ideas, new products and product marketing
CS316/CS8661/Internet Programming Lab	
C316.1	Construct Web pages using HTML/XML and style sheets.
C316.2	Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms.
C316.3	Develop dynamic web pages using server side scripting.
C316.4	Use PHP programming to develop web applications.
C316.5	Construct web applications using AJAX and web services.
CS317/CS8662/Mobile Application Development Laboratory	
C317.1	Develop mobile applications using GUI and Layouts.
C317.2	Develop mobile applications using Event Listener.
C317.3	Develop mobile applications using Databases.
C317.4	Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multi-threading and GPS.
C317.5	Analyze and discover own mobile app for simple needs.
CS318/HS8581/Professional Communication	
C318.1	Make effective presentations
C318.2	Participate confidently in Group Discussions.
C318.3	Attend job interviews and be successful in them.
C318.4	Develop adequate Soft Skills required for the workplace
C318.5	Group discussion and presentation
CS319/CS8661/ Mini Project	
C319.1	Choose problems with technical importance and societal contribution.
C319.2	Identify and survey the relevant literature for getting exposed to related solutions
C319.3	Build project plans with feasible requirements
C319.4	Analyze, design and develop adaptable and reusable solutions
C319.5	Implement and test solutions to trace against the user requirements
Year/Semester: IV/VII	
CS401/MG8591/Principles of Management	
C401.1	Understand the evolution of management theories and organization culture.
C401.2	Understand the concepts of planning, types and decision making ability with strategic planning.
C401.3	Understand the concept of organization, departmentalization and activities of HR.
C401.4	Understand individual and group behavior, motivational techniques and leadership qualities with effective communication
C401.5	Understand and control effectively budgetary and non-budgetary items using modern IT tools.
CS402/CS8792/Cryptography And Network Security	
C402.1	Understand the fundamentals of networks security, security architecture, threats and vulnerabilities

C402.2	Apply the different cryptographic operations of symmetric cryptographic algorithms
C402.3	Apply the different cryptographic operations of public key cryptography
C402.4	Apply the various Authentication schemes to simulate different applications.
C402.5	Understand various Security practices and System security standards
CS403/CS8791/Cloud Computing	
C403.1	Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
C403.2	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.
C403.3	Explain the core issues of cloud computing such as resource management and security.
C403.4	Be able to install and use current cloud technologies.
C403.5	Evaluate and choose the appropriate technologies, algorithms and approaches for implementation and use of cloud.
CS404/OEC754 – Medical Electronics	
C404.1	Know the human body electro- physiological parameters and recording of bio-potentials
C404.2	Comprehend the non-electrical physiological parameters and their measurement – body temperature, blood pressure, pulse, blood cell count, blood flow meter etc.
C404.3	Interpret the various assist devices used in the hospitals viz. pacemakers, defibrillators, dialyzers and ventilators
C404.4	Comprehend physical medicine methods eg. ultrasonic, shortwave, microwave surgical diathermies , and bio-telemetry principles and methods
C404.5	Know about recent trends in medical instrumentation

C405/ GE8077/Total Quality Management	
C405.1	Describe the dimensional barrier regarding Quality.
C405.2	Summarize the Total quality principles.
C405.3	Demonstrate the tools utilization for quality improvement.
C405.4	Discover the new decision of principle in real time projects.
C405.5	Analyze the various types of techniques are used to measure quality.
CS406/GE8071/Disaster Management	
C406.1	Differentiate the types of disasters, causes and their impact on environment and society
C406.2	Elaborate on the Principles of disasters management.
C406.3	Explain the application of modern techniques used in disaster mitigation and management.
C406.4	Assess vulnerability and various methods of risk reduction measures as well as mitigation.
C406.5	Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.
CS407/CS8711/Cloud Computing Laboratory	
C407.1	Configure various virtualization tools such as Virtual Box, VMware workstation.
C407.2	Design and deploy a web application in a PaaS environment.
C407.3	Learn how to simulate a cloud environment to implement new schedulers.
C407.4	Install and use a generic cloud environment that can be used as a private cloud.
C407.5	Manipulate large data sets in a parallel environment.
CS408/IT8761/Security Laboratory	
C408.1	Develop code for classical Encryption Techniques to solve the problems.
C408.2	Build cryptosystems by applying symmetric and public key encryption algorithms.
C408.3	Construct code for authentication algorithms.
C408.4	Develop a signature scheme using Digital signature standard.

C408.5	Demonstrate the network security system using open source tools.
Year/Semester: IV/VIII	
CS409/GE8076/Professional Ethics in Engineering	
C409.1	Understand the awareness on engineering ethics and human values.
C409.2	Install moral and social values and loyalty to the society.
C409.3	Able to appreciate the rights of others.
C409.4	Know the responsible experimenters and knowledge on balance outlook on law.
C409.5	Understand the safety, responsibilities and rights.
CS410/CS8078/Green Computing	
C410.1	Acquire knowledge to adopt green computing practices to minimize negative impacts on the environment.
C410.2	Enhance the skill in energy saving practices in their use of hardware.
C410.3	Evaluate technology tools that can reduce paper waste and carbon footprint by the stakeholders.
C410.4	Understand the ways to minimize equipment disposal requirements.
C410.5	Identify Environment disaster and recover by green computing
CS411/CS8811/ Project Work	
C411.1	Identify technically and economically feasible problems of social relevance.
C411.2	Plan and build the project team with assigned responsibilities
C411.3	Identify and survey the relevant literature for getting exposed to related solutions.
C411.4	Analyze, design and develop adaptable and reusable solutions of minimal complexity by using modern tools.
C411.5	Implement and test solutions to trace against the user requirements.

K. Sathish Kumar
HOD/CSE
Head of the Department
Department of Computer Science & Engineering
M.A.M. School of Engineering
Siruganur, Tiruchirappalli - 621 105.

PRINCIPAL
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M.A.M. SCHOOL OF ENGINEERING
SIRIGANUR, TIRUCHIRAPPALLI-621 105.

Department of Electrical and Electronics Engineering
PROGRAMME OUTCOMES

PROGRAM OBJECTIVES

- **PO1 Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
- **PO2 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.
- **PO3 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 & safety and the cultural, societal and environmental considerations.
- **PO4 Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis & interpretation of data and synthesis of the information to provide valid conclusions.
- **PO5 Modern tool usage:** Create, select and apply appropriate techniques, resources and modern engineering & IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- **PO6 The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal & cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- **PO7 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.
- **PO8 Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- **PO9 Individual and teamwork:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
- **PO10 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.
- **PO11 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.

- **PO12 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 OBJECTIVES

- **PSO1** To analyze, design and develop solutions by applying foundational concepts of Electrical and Electronics Engineering.
- **PSO2** To apply design principles and best practices for developing quality products for scientific and business applications.
- **PSO3** To adapt to modern power electronics and renewable energy sources to innovate ideas and solutions to existing/novel problems.

HOD/EEE

HEAD OF THE DEPARTMENT
ELECTRICAL and ELECTRONICS ENGINEERING
M.A.M. SCHOOL OF ENGINEERING
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PRINCIPAL

PRINCIPAL
M.A.M. SCHOOL OF ENGINEERING
SIRIGANUR, TIRUCHIRAPPALLI-621 105.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
Regulation 2017 – UG

YEAR/SEMESTER: I/I	
C101/HS8151 -Communicative English	
C101.1	Enable the development of basic grammar to enhance language for a better communication
C101.2	Strengthen general comprehending skills and present lucid skills in free writing
C101.3	Foster an environment for reading and develop good language skills.
C101.4	Speak, read and write effectively for a variety of professional and social settings
C101.5	Listen, comprehend and respond to different spoken and written discourses/excerpts in different accents and write different genres of texts adopting various writing strategies.
C102/MA8151 - Engineering Mathematics – I	
C102.1	Use both the limit definition and rules of differentiation to differentiate functions
C102.2	Associate differentiation to solve maxima and minima problems
C102.3	Discuss integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus
C102.4	Associate integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition tochange of order and change of variables
C102.5	Explain various techniques in solving differential equations
C103/PH8151 - Engineering Physics	
C103.1	Explain the basics of properties of matter and its applications.
C103.2	Identify the concepts of waves and optical devices and their applications in fibre optics
C103.3	Demonstrate the concepts of thermal properties of materials and their applications in expansion joints and heatexchangers
C103.4	Describe advanced physics concepts of quantum theory and its applications in tunneling microscopes
C103.5	Summarize the basics of crystals and their structures and different crystal growth techniques
C104/CY8151-Engineering Chemistry	
C104.1	Explain the basics of properties of matter and its applications.
C104.2	Identify the concepts of waves and optical devices and their applications in fibre optics
C104.3	Demonstrate the concepts of thermal properties of materials and their applications in expansion joints and heatexchangers
C104.4	Describe advanced physics concepts of quantum theory and its applications in tunneling microscopes
C104.5	Summarize the basics of crystals and their structures and different crystal growth techniques.

C105/GE8151-Problem Solving and Python	
C105.1	Discuss the logical solutions through Flowcharts, Algorithms and Pseudo code.
C105.2	Explain the syntax for python programming constructs.
C105.3	Compute the flow of the program to obtain the programmatic solution.
C105.4	Examine the programs with sub problems using 'Python' language
C105.5	Compute the compound data using Python lists, tuples, and dictionaries Apply python programs to read and write data from/to files.
C106/CY8151-Engineering Chemistry	
C106.1	The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.
C106.2	Develop an understanding of the basic concepts of phase rule and its applications to single and two component systems and appreciate the purpose and significance of alloys.
C106.3	Preparation, properties and applications of engineering materials.
C106.4	Types of fuels, calorific value calculations, manufacture of solid, liquid and gaseous fuels.
C106.5	Principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells
C107/GE8161- Problem Solving and PythonProgramming Laboratory	
C107.1	Write, test, and debug simple Python programs.
C107.2	Apply the concept of conditionals and loops in Python programs.
C107.3	Develop the Python programs step-wise by defining functions and calling them.
C107.4	Use Python lists, tuples, dictionaries for representing compound data.
C107.5	Read and write data from/to files in Python.
C108/BS8161 -Physics and chemistrylaboratory	
C108.1	Determine the Modulus of elasticity of materials and Coefficient of Viscosity of liquids.
C108.2	Determine the Thermal Conductivity of bad conductor using Lee's disc method
C108.3	Calculate the Compressibility of liquids and velocity of ultrasonic waves in liquids.
C108.4	Measure the wavelength of prominent spectral lines of Mercury Spectrum and particle size of powder usingdiffraction phenomenon and thickness of thin materials using interference phenomenon.
C108.5	Determine the band gap energy of a semiconductor.
YEAR/SEMESTER : I/II	
C109/HS8251-TECHNICAL ENGLISH	
C109.1	Breakdown the ideas in to its elementary constituents, analyze and act after a meaning full thought process.
C109.2	Analyze the phrase and passage and explicitly pass on the ideas meaning fully.
C109.3	Manage to interpret the given phrase or the graphical rendering and review the contentswell individually or as a group.
C109.4	Concentrate on the communication aspect of complicated ideas and respond positively.

C109.5	Debate the issues and find the rudiments of the problem individually and as a group. andrespond intelligently and seek clarification and understand completely.
C110/MA8251 -Engineering Mathematics II	
C110.1	Diagonalizable symmetric matrices and similar matrices using Eigen values andEigen vectors.
C110.2	Explain gradients, potential functions, and directional derivatives of functions of several variables. Also Compute line, surface and volume integral using Gauss divergence, Green'sand Stoke's theorem.
C110.3	Discuss analytic functions in heat and fluid flow.
C110.4	Extend the concept of contour integrals in evaluating Real integrals.
C110.5	Discuss Laplace Transform methods to solve initial value problems for constantcoefficient linear ODEs.
C111/PH8253& PHYSICS FORELECTRONICS ENGINEERING	
C111.1	Explain the classical and quantum electron theories, electrical properties of materials andenergy band structures
C111.2	Describe the basics of semiconductor physics and its applications in various devices
C111.3	Demonstrate the properties of magnetic and dielectric materials
C111.4	Classify the functioning of optical materials for optoelectronics .
C111.5	Describe the basics of quantum structures and their applications in spintronics and nanodevices.
C112/BE8252-Basic Civil and Mechanical Engineering	
C112.1	Appreciate the Civil and Mechanical Engineering components of Projects.
C112.2	Measure distances and area by surveying
C112.3	Explain the usage of construction material and proper selection of construction materials.
C112.4	Identify the components used in power plant cycle, demonstrate working principles of petroland diesel engine.
C112.5	Elaborate the components of refrigeration and Air conditioning cycle.
C113/EE8251 & CIRCUIT THEORY	
C113.1	Discuss the differenent laws of Electric circuits and analysis of AC & DC circuits
C113.2	Solve the AC and DC circuits using various network theorems and reduction techniques
C113.3	Explain the resonance phenomenon in different coupled tuned circuits
C113.4	Discuss the transient response of DC circuits and the characterization of different parametersets.
C113.5	Summarize the three phase circuits with help of voltage and current phasor diagrams.
C114/GE8291 - ENVIRONMENTALSCIENCE AND ENGINEERING	
C114.1	Interpret the basic concept of Ecosystems and Biodiversity.
C114.2	Distinguish the types of pollution and its control measures.
C114.3	Describe the importance of natural resources and Disaster management.
C114.4	Illustrate the importance of environment by assessing its impact on the human world.
C114.5	Summarize the population related issues and types of welfare programmes in the society.
C115/GE8261 / ENGINEERING PRACTICES LAB	

C115.1	Identify Tools and Techniques used for Sheet metal Fabrication
C115.2	Use welding equipment to join the structures
C115.3	Demonstrate Plumbing requirements of domestic Buildings
C115.4	Apply the skills of basic electrical engineering for house wiring practice
C115.5	Measure Various Electrical quantities.
C116/EE8261-Electric Circuits Laboratory	
C116.1	Analysis of various circuit theorems and concepts in engineering applications
C116.2	Review of various simulation tools and demonstrate with various circuits
C116.3	Exhibit ethical Principles in engineering Practices
C116.4	Perform task an individual and or team member to manage the task in time
C116.5	Express the Engineering activities with effective Presentation and report
YEAR/SEMESTER : II/III	
C201/MA8353/Transforms and Partial differential Equations	
C201.1	Represent the physical processes as partial differential equations and solve both homogenous and non-homogeneous equations.
C201.2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications
C201.3	Solve the physical significance of Fourier series techniques in solving one and two dimensionalheat flow problems and one dimensional wave equations
C201.4	Formulate the mathematical principles on transforms and partial differential equations wouldprovide them the ability to formulate and solve some of the physical problems of engineering
C201.5	Construct an effective mathematical tool for the solutions of partial differential equations by usingZ transform techniques for discrete time systems
C202/EE8351-Digital Logic Circuits	
C202.1	Convert various number systems; simplify the logical expressions using Boolean functions and compareDigital logic families
C202.2	Design of combinational logic circuits, multiplexer, demultiplexer and code converters.
C202.3	Design a Synchronous Sequential Circuits
C202.4	Analyze and design the asynchronous sequential circuit and PLDs
C202.5	Develop the VHDL coding for Combinational logic and Sequential circuits and digital Simulation fordevelopment of application-oriented logic circuits
C203/EE8391 &Electromagnetic Theory	
C203.1	Explain the basic mathematical concepts related to electromagnetic fields & Electrostatic fields
C203.2	Interpret the concepts of electrical potential, energy density and their applications
C203.3	Illustrate the concepts of magneto statics, magnetic flux density, scalar and vector potential and its applications
C203.4	Explain the concepts of Faradays law, Induced emf and Maxwell's equations to analyze the electrodynamicsfields.
C203.5	Outline the basic concepts of electromagnetic waves, parameters and Electromagnetic fields and design Electricalequipment and systems.
C204/EE8301 /Electrical Machines - I	

C204.1	Summarize the Magnetic materials used in Magnetic Circuits
C204.2	Demonstrate the operation of Transformer
C204.3	Explain the Electromechanically Energy Conversion
C204.4	Outline the operation of DC Generators
C204.5	Outline the operation of DC Motors
C205/EC8353 &Electronic Devices andCircuits	
C205.1	Explain the Structure of basic electronic devices and its characteristics
C205.2	Construction and working of various active and passive devices like MOSFET ,UJT ,BJT,JFET
C205.3	Analysis of BJT in various modes of operation in gain and frequency response and small signalamplifier circuits
C205.4	Demonstrate the different stages of amplifier , differential amplifier cascade amplifier, power amplifier
C205.5	Explain the functions of various oscillator circuits and positive and negative feedback circuits
C206/ME8792 /Power Plant Engineering	
C206.1	Explain the different blocks in coal based power plant
C206.2	Summarize the working of diesel, gas turbine and combined cycle power plant
C206.3	Explain the layout and various types of reactors in Nuclear Power Plant
C206.4	Illustrate the operation of various types of renewable power plant
C206.5	Summarize the tariffs and performance parameter of the power plant
C207/EC8311 &Electronics Laboratory	
C207.1	Illustrate the operation of Semiconductor devices with their characteristics for various applications
C207.2	Construct the amplifier and Oscillator Circuits for any frequency using BJT and determine the outputresponses
C207.3	Compare the ripple factor of the diode rectifiers with and without filters
C207.4	Identify the performance of Multivibrators and differential amplifier using FET
C207.5	Build passive filters for particular cutoff frequencies
C208/EE8311 & Electrical MachinesLaboratory - I	
C208.1	Analyze the characteristics of DC generator and DC motor on No load and loaded conditions
C208.2	Examine the various losses and efficiency of DC machines and transformer
C208.3	sketch the load characteristics of single phase and three phase transformer
C208.4	Develop the equivalent circuit of single phase transformer
C208.5	Explain the concepts of starters and connection of three phase transformer
YEAR/SEMESTER: II/IV	
C209/MA8491/Numerical Methods	
C209.1	Explain the basic concepts and techniques of solving algebraic and transcendental equations.
C209.2	Infer the numerical techniques of interpolation and error approximations in various intervals in real lifesituations.
C209.3	Extend the numerical techniques of differentiation and integration for engineering

	problems.
C209.4	Illustrate the knowledge of various techniques and methods for solving first and second order ordinarydifferential equations.
C209.5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certaintechniques with engineering applications.
C210/EE8401-Electrical Machines - II	
C210.1	Outline the construction and working principle of Synchronous Generator and MMF curves and armaturewindings.
C210.2	Illustrate the principle of operation and performance of Synchronous motor
C210.3	Outline the construction and working principle of Three-phase Induction Motor
C210.4	Explain the starters and speed control method of three phase Induction motor.
C210.5	Demonstrate the construction and working principle of Special Machines and single-phase induction motor.
C211/EE8402/Transmission and Distribution	
C211.1	Discuss the various parameters of transmission line and structure of power system and calculation ofcapacitance and Inductance values
C211.2	Summarize the concepts of ABCD parameters and regulation, efficiency of transmission line.
C211.3	Discuss the various types of insulators, its performance and calculation sag in Overhead transmissionsystem.
C211.4	Explain the different construction of cables and grading of cables using in transmission system.
C211.5	Discuss the concepts of distribution system and layout of substation, concepts of HVDC, FACTS ..
C212/EE8403/ MEASUREMENT & INSTRUMENTATION	
C212.1	Summarize the characteristics and errors of the instruments and the need for calibration
C212.2	Explain the various operation of AC and DC electrical and electronic instruments
C212.3	Describe the various measurement devices in AC as well as in DC
C212.4	Explain the different storage and display devices used in electrical measurements
C212.5	Discuss the concepts and operational features of different display Devices and Data Acquisition System.
C213/EE8451 /Linear Integrated Circuits andApplications	
C213.1	Infer the process in IC fabrication procedure
C213.2	Analyze the characteristics of op-amp
C213.3	Illustrate the importance of signal analysis using op-amp based circuits
C213.4	Explain the functional blocks and the applications of special ICs like timers, PLL circuits
C213.5	Explain the functional blocks of application Ics like regulator, SMPS, Function generator
C214/IC8451 /Control Systems	
C214.1	Model the various systems by mathematical equations and find transfer function
C214.2	Explain the basic components of feedback control systems and summarize the

	various errors
C214.3	Identify the performance parameters of the system through the time domain and frequency domain approach
C214.4	Infer the stability of the system in time domain and frequency domain & apply different compensationtechniques to improve the stability of the system
C214.5	Explain the state space variables in effect of state feedback of system
C215/EE8411 Electrical Machines Laboratory - II	
C215.1	Model the various systems by mathematical equations and find transfer function
C215.2	Explain the basic components of feedback control systems and summarize the various errors
C215.3	Identify the performance parameters of the system through the time domain and frequency domain approach
C215.4	Infer the stability of the system in time domain and frequency domain & applu different compensationtechniques to improve the stability of the system
C215.5	Explain the state space variables in effect of state feedback of system
C216/EE8461 Linear and Digital Integrated	
C216.1	Implement Boolean function using logic gates
C216.2	Implement Code conversion using logic gates
C216.3	Design and implement 4 bit Shift Registers
C216.4	Design and implement applications of Op-Amp
C216.5	Design and implement counters using specific counter IC
C217/EE8412/Technical Seminar	
C217.1	Function effectively as an individual and Make effective presentation on Engineering/ technology .
C217.2	Review, prepare and present technological developments in the field of electrical and electronicsengineering.
C217.3	Design documentation and write effective reports on seminar topics
C217.4	Exhibit ethical principles in engineering practices
C217.5	Perform task as an individual and / or team member to manage the task in time
YEAR/SEMESTER: III/V	
C301/EE8501/Power System Analysis	
C301.1	Relate the per unit values and to formulate bus impedance, admittance matrices for the givenpower system network.
C301.2	Demonstrate load flow techniques using Newton – Raphson and Gauss Seidel methods for thepower system networks
C301.3	Identify the power system network under symmetrical fault condition using The venin's theoremand bus impedance matrix
C301.4	Construct the power system network under unsymmetrical fault condition using symmetrical Components
C301.5	Discover the transient stability of power system using equal area criterion and to apply modifiedEuler's methods to solve the swing equation
C302/EE8551-Microprocessors and Microcontrollers	

C302.1	Describe the basic Architecture of 8085 Microprocessor and working of all blocks of theprocessor, IO and memory interfacings with necessary timing diagrams.
C302.2	Classify the instructions with the help of Addressing modes of 8085 with necessary programs
C302.3	Explain the basic Architecture of 8051 Microcontroller with working of various blocks of thecontroller like Interrupts, Timer, IO ports etc. with necessary timing diagram and compare the programming concepts with 8085.
C302.4	Illustrate how the different peripherals are interfaced with Microprocessor & Microcontroller
C302.5	Apply the knowledge of programming concepts of 8051 Microcontroller for various applicationslike keyboard display interface, servo motor etc.,
C303/EE8552/Power Electronics	
C303.1	Describe the types of power semiconductor devices and their switching characteristics
C303.2	Explain the operation ,characteristics and performance parameters of controlled rectifiers
C303.3	Discover the operation, switching techniques and basic topologies of DC-DC switching regulators
C303.4	Explain the different modulation techniques of pulse with modulated inverters and to understandharmonic reduction methods
C303.5	Demonstrate the operation of AC voltage controller and various configurations and its applications
C304/EE8591/Digital Signal Processing	
C304.1	Classify the different types of Signals and Systems
C304.2	Explain the LTI systems with different inputs using Z transform
C304.3	Apply DFT & FFT for the analysis of digital signals
C304.4	Develop IIR filters from analog filters and build FIR filters using windows and samplingtechnique
C304.5	Classify the DSP Processor and its architecture for different applications
C305/CS8392 /Object Oriented Programming	
C305.1	Explain the Object Oriented Programming concepts and basic features of Java
C305.2	Interpret the OOPS principles with packages, inheritance and interfaces
C305.3	Interpret exceptions and use I/O streams
C305.4	Illustrate a java application with threads and generics classes
C305.5	Demonstrate and build simple Graphical User Interfaces
C306/OMD551- Bio Medical Instrumentation	
C306.1	Study about the different bio potential and its propagation
C306.2	Understand the different types of electrodes and its placement for various recording
C306.3	Study about the different bio signal characteristics and electrode configuration
C306.4	Study the design of bio amplifier for various physiological recording
C306.5	Learn the different measurement techniques for non-physiological parameters.

C307/EE8511/Control and Instrumentation Laboratory	
C307.1	Analyze the characteristics of P, PI and PID controllers experimentally and analyze the stability ofthe control system using MATLAB
C307.2	Compute the transfer function of a Field controlled DC motor experimentally and analyze theresponse of Lag, Lead and Lag-Lead Compensators
C307.3	Analyze the transient response of Position Control system experimentally and analyze the Characteristics of Synchro-Transmitter- Receiver and to Use MATLAB for the Simulation of Control Systems.
C307.4	Ability to analyze the basic concepts of bridge networks and to analyze the Dynamics ofSensors/Transducers
C307.5	Measure the Power and Energy experimentally and analyze signal conditioning circuits and to UseMATLAB for Process Simulation
C308/HS8581/Professional Communication	
C308.1	Ability to make effective presentations
C308.2	Ability to Participate confidently in Group Discussions.
C308.3	Attend job interviews and be successful in them
C308.4	Develop adequate Soft Skills required for the workplace
C308.5	Exhibit ethical principles in engineering practices
C309/CS8383/Object Oriented Programming Laboratory	
C309.1	Develop and implement Java programs for simple applications that make use of classes, packagesand interfaces
C309.2	Develop and implement Java programs with arraylist, exception handling and multithreading
C309.3	Design applications using file processing, generic programming and event handling
C309.4	Exhibit ethical principles in engineering practices
C309.5	Perform task as an individual and / or team member to manage the task in time
YEAR/SEMESTER: III/VI	
C310/EE8601/Solid State Drives	
C310.1	Classify the various types of drives and load torque characteristics and Apply the multi quadrantdynamics in hoist load system.
C310.2	Illustrate the operation of steady state analysis of single phase and three phase fully controlled converterand Chopper fed separately excited dc motor drives and discuss the various control strategies of converter
C310.3	Explain the operation and characteristics of various methods of solid state speed control ofinduction motor.
C310.4	Describe the operation of various modes of V/f control of synchronous motor drives and different typesof permanent magnet synchronous motor drives.
C310.5	Design a current and speed controller and develop the transfer function for DC motor, load andconverter, closed loop control with current and speed feedback.
C311/EE8602-Protection and Switchgear	
C311.1	Explain the various faults and protective schemes in the Power systems

C311.2	Summarize the operation of various protection relays in the power systems
C311.3	Infer the need and procedure of apparatus protection
C311.4	Demonstrate about static and numerical relays
C311.5	Illustrate the problems associated with circuit interruption
C312/EE8691/Embedded Systems	
C312.1	Outline the basic build process of embedded systems, structural units in embedded processor andselection of processor and memory devices depending upon the applications.
C312.2	Explain the different types of I/O device ports, buses and different interfaces for data transfer inembedded networking.
C312.3	Demonstrate the different techniques like state machine model, sequential program model andconcurrent model in Embedded Product Development Life Cycle (EDLC)
C312.4	Explain the basic concept of Real Time Operating Systems and scheduling of different task andcompare the features of different types of Real Time Operating Systems
C312.5	Summarize the concepts of Embedded systems in real time applications
C313/GE8075 / Intellectual Property Rights	
C313.1	Understand the concept of intellectual property rights
C313.2	Identify the registration procedure of IPR
C313.3	Determine various acts related to IPR
C313.4	Explain IPR for Digital products
C313.5	Acquire the Knowledge on IPR related law
C314/EE8005/Special Electrical Machines	
C314.1	Discuss the performance and characteristics of synchronous reluctance motors, and to apply the knowledge of Basic science, Circuit theory, Electromagnetic Field theory, Control theory
C314.2	Demonstrate the performance and characteristics of stepping motors
C314.3	Explain the performance and characteristics of Switched Reluctance Motors
C314.4	Analyze the performance and characteristics of permanent magnet brushless D.C. Motors
C314.5	Outline the performance and characteristics of Permanent Magnet Synchronous Motors
C315/EE8681/Microprocessors and Microcontrollers Laboratory	
C315.1	Design a program for arithmetic operation, Ascending/ Descending order, finding Maximum/Minimum numbers, rotate instruction and code conversions and execute using 8085processor
C315.2	Identify and convert Analog to Digital , Digital to Analog numbers and implement the traffic lightcontroller with 8085
C315.3	Design a code to display the given words using keyboard display controller for serial communication and programming practices with simulator/Emulator /open source
C315.4	Analyze a program using read key to interface with display units and demonstrate conditionaljumps ,loops and calling subroutines with 8051 Microcontroller .

C315.5	Create program using I/O port ,8051 timer , A/D & D/A interface with DC & AC motors anddevelop a program for hardware application using embedded processors
C316/EE8661/Power Electronics and Drives Laboratory	
C316.1	Draw the VI characteristics of SCR and TRIAC
C316.2	Analyze the characteristics of MOSFET and IGBT
C316.3	Design a single phase AC to DC half and fully controlled converter
C316.4	Analyze the output response of step down chopper and step up MOSFET and draw the outputwaveforms of single phase IGBT based PWM inverter.
C316.5	Observe the response of IGBT based three-phase PWM inverter and Resonant dc-to-dc converter
C317/EE8611/Mini Project	
C317.1	Evaluate the final year project work and find solution by formulating proper methodology.
C317.2	Apply practical knowledge within the chosen area of expertise for project development.
C317.3	Identify, analyze, design and handle prototype projects with a complete and organized approach.
C317.4	Contribute as an individual or in a team in development of technical projects.
C317.5	Develop effective communication skills for presentation of project related activities and prepare mini project reports and examination
YEAR/SEMESTER: IV/VII	
C401/ EE 8701-High Voltage Engineering	
C401.1	Compare the various types of over voltages in power system and protection methods
C401.2	Infer the Nature of Breakdown mechanism in solid, liquid and gaseous dielectrics power flow problems by different iterative methods
C401.3	Demonstrate the generation of over voltages in laboratories
C401.4	Analyze and understand the measurement of over voltages
C401.5	Explain the testing of power apparatus, and to impart knowledge on insulation coordination
C402/ EE8702-Power System Operation and Control	
C402.1	Analyze various load characteristics with load curve and load duration curve
C402.2	Model power-frequency dynamics and to design power-frequency controller
C402.3	Examine the modeling of reactive power-voltage interaction and the control actions
C402.4	Solve economic dispatch problems and unit commitment problems in power systems
C402.5	Interpret the economic operation of power system, SCADA and its application
C403/ EE8703-Renewable Energy Systems	
C403.1	Outline about Renewable Energy resources
C403.2	Summarize wind energy system
C403.3	Layout of Solar PV And Thermal Systems
C403.4	Examine issues in Bio energy

C403.5	Analyze the renewable energy systems
C404/ OCS752-Introduction to C Programming	
C404.1	Understand the basic concepts of C programming for problem-solving
C404.2	Develop simple applications using basic programming constructs
C404.3	Develop applications using arrays and strings to solve different problems
C404.4	Apply the concepts of Functions modules, its usage and memory allocation using Pointers
C404.5	Understand the concept of structures: declaration, initialization and implementation and develop applications using structures
C405/ GE8071-DIASTER MANAGEMENT	
C405.1	Differentiate the types of disasters, causes and their impact on environment and society
C405.2	Understand approaches of Disaster Risk Reduction (DRR)
C405.3	Understand the relationship between vulnerability, disasters, disaster prevention and risk reduction
C405.4	Outline the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.
C405.5	Develop awareness of institutional processes in the country and rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity
C406/EE8010-Power System Transients	
C406.1	Ability to understand and analyze switching and lightning transients.
C406.2	Ability to acquire knowledge on generation of switching transients and their control.
C406.3	Ability to analyze the mechanism of lighting strokes.
C406.4	Ability to understand the importance of propagation, reflection and refraction of travelling waves.
C406.5	Ability to find the voltage transients caused by faults.
C407/ EE 8711-Power System Simulation Laboratory	
C407.1	Develop the coding to analyze the performance of transmission line in electrical power system and to formulate bus impedance, admittance matrix for the given power network.
C407.2	Develop the coding to Analyse the load flow problems using Newton Raphson and Gauss seidal methods for the power system and interpret the results.
C407.3	Design the simulation model to Analyse the power system under symmetrical and unsymmetrical fault conditions and analyse the transient stability of the power system
C407.4	Develop the coding to Analyse the economic dispatch and load frequency dynamic problems for the given power system and interpret the results
C407.5	Design the simulation model to Analyse the occurrence of electromagnetic transients in power system and interpret the results
C408/ EE 8712-Renewable Energy Systems Laboratory	
C408.1	Analyze the V-I characteristics and efficiency of 1 KW solar PV system with stand alone and grid connected by conducting experiment and simulation using MATLAB

	Simulink.
C408.2	Analyze the performance and assessment of micro wind energy generator by conducting experiment and simulation using MATLAB Simulink.
C408.3	Analyze the performance and assessment of solar-wind hybrid system by conducting experiment and simulation using MATLAB Simulink
C408.4	Analyze the Hydel power using MATLAB Simulink and analyze the performance and assessment of Fuel cell by conducting experiment and simulation using MATLAB Simulink.
C408.5	Analyze the various types of intelligent controller for hybrid system using MATLAB Simulink.
YEAR/SEMESTER: IV/VIII	
C409/GE8076-PROFESSIONAL ETHICS IN ENGINEERING	
C409.1	Describe an awareness of human values to appreciate the rights of others and stress management
C409.2	Illustrate the moral issues and models of professional roles
C409.3	Discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.
C409.4	Take part in describing the responsibilities of an Engineer and Intellectual Property Rights of a Human
C409.5	Elaborate about the social responsibilities on multinational corporations related to engineering
C410/EE8017 HIGH VOLTAGE DIRECT CURRENT TRANSMISSION	
C410.1	Ability to understand the principles and types of HVDC system.
C410.2	Ability to analyze and understand the concepts of HVDC converters.
C410.3	Ability to acquire knowledge on DC link control.
C410.4	Ability to understand the concepts of reactive power management, harmonics and power flow analysis.
C410.5	Ability to get knowledge about Planning of DC power transmission and comparison
C411/EE 8811-Project Work	
C411.1	Identify and apply the real world and societal importance problems in the Electrical and its allied area.
C411.2	Identify, analyze, design, implement and handle prototype projects with a complete and organized solution methodologies
C411.3	Apply modern engineering tools for solution
C411.4	Contribute as an individual or in a team in development of technical projects
C411.5	Develop effective communication skills for presentation of project related activities and prepare reports and examination following professional ethics

HOD/EEE

HEAD OF THE DEPARTMENT
ELECTRICAL and ELECTRONICS ENGINEERING
M.A.M SCHOOL OF ENGINEERING
SIRUGANUR, TRICHY - 621 105.

PRINCIPAL

PRINCIPAL
M.A.M. SCHOOL OF ENGINEERING
SIRIGANUR, TIRUCHIRAPPALLI-621 105.

Department of Electronics and communication Engineering
Programme Outcomes

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**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.
PO3	**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.
PO4	**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.
PO5	**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.
PO6	**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.
PO7	**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.
PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**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.
PO11	**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.
PO12	**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.

Programme Specific Outcomes – Electronics and Communication Engineering

PSO 1	To analyze, design and develop solutions by applying foundational concepts of electronics and communication engineering
PSO 2	To apply design principles and best practices for developing quality products for scientific and business applications.
PSO 3	To adapt to emerging information and communication technologies (ICT) to innovate ideas and solutions to existing/novel problems.

HOD/ECE

HEAD OF THE DEPARTMENT
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
M.A.M. SCHOOL OF ENGINEERING
SIRUGANUR, TIRUCHIRAPPALLI - 621 105

PRINCIPAL

PRINCIPAL
M.A.M. SCHOOL OF ENGINEERING
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Department Of Electronics and Communication 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
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 PROGRAMMINGLABORATORY	
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
C108.2	The student will be able to analyze the physical principle involved in various
C108.3	Students will be able to understand different types of instruments for analyzing
C108.4	Students will be able to acquire hands-on knowledge in the quantitative
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 / PH8253/ PHYSICS FOR ELECTRONICS ENGINEERING	
C111.1	Gain knowledge on classical and quantum electron theories, and energy band structures
C111.2	Acquire knowledge on basics of semiconductor physics and its applications in various devices.
C111.3	Get knowledge on magnetic and dielectric properties of materials,
C111.4	Have the necessary understanding on the functioning of optical materials for optoelectronics.
C111.5	Understand the basics of quantum structures and their applications in spintronics and
C112 /BE8254/BASIC ELECTRICAL AND INSTRUMENTATION ENGINEERING	
C112.1	Understand the concept of three phase power circuits and measurement.
C112.2	Comprehend the concepts in electrical generators, motors and transformers
C112.3	Choose appropriate measuring instruments for given 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

C113 /EC8251/CIRCUIT ANALYSIS	
C113.1	Develop the capacity to analyze electrical circuits, apply the circuit theorems in real time
C113.2	Design and understand and evaluate the AC and DC circuits.
C113.3	Practical implications of the fundamentals of Ohm"s law, Kirchhoff"s current and
C113.4	Accurate measurement of voltage, current, power and impedance of any circuit
C113.5	DC analysis, Transient analysis and Frequency analysis of a given circuit depending
C114 /EC8252/ELECTRONIC DEVICES	
C114.1	Explain the V-I characteristic of diode, UJT and SCR
C114.2	Describe the equivalence circuits of transistors
C114.3	Operate the basic electronic devices such as PN junction diode, Bipolar and Field
C114.4	Basic of Special Semiconductor Devices
C114.5	Function and applications of Power Devices and Display Devices
C115 /EC8261/CIRCUIT AND DEVICES LABORATORY	
C115.1	Analyze the characteristics of basic electronic devices
C115.2	Design RL and RC circuits
C115.3	Verify Thevinin & Norton theorem KVL & KCL, and Super Position Theorems
C115.4	Understand the operation of basic solid state device
C115.5	Plot the response of wave shaping circuits
C116 /GE8261/ENGINEERING PRACTICES LABORATORY	
C116.1	Gets exposure regarding Joining operations in engineering materials.
C116.2	Carry out the basic machining operations in engineering materials.
C116.3	Carry out basic home electrical works and appliances.
C116.4	Measure the electrical quantities.
C116.5	Understand basic electronic components.
Year/Semester: II/III	
C201/ MA8352/ LINEAR ALGEBRA & PARTIAL DIFFERENTIAL EQUATION	
C201.1	Explain the fundamental concepts of advanced algebra and their role in modern Mathematics and applied contexts.
C201.2	Able to solve engineering problems using Fourier series.
C201.3	Demonstrate accurate and efficient use of advanced algebraic techniques.
C201.4	Demonstrate their mastery by solving non - trivial problems related to the concepts and by proving simple theorems about the statements proven by the text
C201.5	Able to solve various types of partial differential equations.
C202/ EC8393/ FUNDAMENTAL OF DATA STRUCTURES	
C202.1	Implement linear and non-linear data structure operations using C
C202.2	Suggest appropriate linear / non-linear data structure for any given data set.
C202.3	Apply hashing concepts for a given problem
C202.4	Modify or suggest new data structure for an application
C202.5	Appropriately choose the sorting algorithm for an application
C203/ EC8351/ ELECTRONIC CIRCUITS - I	
C203.1	Acquire knowledge of Working principles, characteristics and applications of BJT and FET
C203.2	Frequency response characteristics of BJT and FET amplifiers
C203.3	Analyze the performance of small signal BJT and FET amplifiers - single stage and multistage amplifiers Apply the knowledge gained in the design of Electronic

	circuits
C203.4	Plot the frequency response of all amplifiers.
C203.5	Design the regulated power supply, troubleshoot and analyze the faults in power supplies.
	C204/ EC8352/ SIGNALS AND SYSTEMS
C204.1	To be able to determine if a given system is linear/causal/stable
C204.2	Capable of determining the frequency components present in a deterministic signal
C204.3	Capable of characterizing LTI systems in the time domain and frequency domain
C204.4	To be able to compute the output of an LTI system in the time and frequency domains
C204.5	Describe the mathematical modelling of DT systems.
	C205/ EC8392/ DIGITAL ELECTRONICS
C205.1	Apply the laws of Boolean algebra to simplify circuits and Boolean algebra expressions
C205.2	Analyze the different methods used for simplifications of Boolean expressions and digital logic families
C205.3	Design and implement Combinational circuits.
C205.4	Design and implement Sequential circuits
C205.5	Study the various types of memory devices and understand the concept PLD's
	C206/ EC8391/ CONTROL SYSTEMS ENGINEERING
C206.1	Identify the various control system components and their representations. Analyze the various time domain parameters
C206.2	Analysis the various frequency response plots and its system.
C206.3	Apply the concepts of various system stability criterions.
C206.4	Design various transfer functions of digital control system using state variable models.
C206.5	Demonstrate the voltage and current time base circuits using SPICE Tool.
	C207/ EC8381/ FUNDAMENTAL OF DATA STRUCTURES IN C LAB
C207.1	Write basic and advanced programs in C Implement functions and recursive functions in C
C207.2	Implement data structures using C
C207.3	Choose appropriate sorting algorithm for an application and implement it in a modularized way
C207.4	Sort and search the data by applying various algorithms.
C207.5	Develop applications in C and Solve problems using various linear data structures algorithms
	C208/ EC8361/ ANALOG & DIGITAL CIRCUITS LAB
C208.1	Design and Test rectifiers, filters and regulated power supplies. Design and Test BJT/JFET amplifiers.
C208.2	Differentiate cascade and cascade amplifiers. Analyze the limitation in bandwidth of single stage and multi stage amplifier
C208.3	Measure CMRR in differential amplifier
C208.4	Simulate and analyze amplifier circuits using PSpice.
C208.5	Design and Test the digital logic circuits.
	C209/ HS8361/ INTERPERSONAL SKILLS/LISTENING AND SPEAKING LAB
C209.1	Take international examination such as IELTS and TOEFL
C209.2	Participate in group discussions

C209.3	Successfully answer questions in Interviews
C209.4	Make effective presentations
C209.5	Participate confidently and appropriately in conversations both formal and informal
	Year/Semester: II/IV
C210/ MA8451 / PROBABILITY AND RANDOM PROCESSES	
C210.1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
C210.2	Understand the basic concepts of one and two dimensional random variables and apply in engineering applications. Apply the concept random processes in engineering disciplines.
C210.3	Apply the concept random processes in engineering disciplines.
C210.4	Understand and apply the concept of correlation and spectral densities.
C210.5	The students will have an exposure of various distribution functions and help in acquiring skills in handling situations involving more than one variable. Able to analyze the response of random inputs to linear time invariant systems.
C211/ EC8452 / ELECTRONIC CIRCUITS II	
C211.1	Analyze different types of amplifier, oscillator and multivibrator circuits
C211.2	Design BJT amplifier and oscillator circuits
C211.3	Analyze transistorized amplifier and oscillator circuits
C211.4	Design and analyze feedback amplifiers
C211.5	Design LC and RC oscillators, tuned amplifiers, wave shaping circuits, multivibrators, power amplifier and DC convertors.
C212/ EC8491/ COMMUNICATION THEORY	
C212.1	Design AM communication systems
C212.2	Design Angle modulated communication systems
C212.3	Apply the concepts of Random Process to the design of Communication systems
C212.4	Analyze the noise performance of AM and FM systems
C212.5	Gain knowledge in sampling and quantization
C213/ EC8451/ ELECTROMAGNETIC FIELDS	
C213.1	Display an understanding of fundamental electromagnetic laws and concepts Write Maxwell's equations in integral, differential and phasor forms and explain their physica.
C213.2	Explain electromagnetic wave propagation in lossy and in lossless media
C213.3	Solve simple problems requiring estimation of electric and magnetic field quantities based on these concepts and laws
C213.4	Perform the relation between the fields under time varying Situations
C213.5	Discuss the principles of propagation of uniform plane waves
C214/ EC8453/ LINEAR INTEGRATED CIRCUITS	
C214.1	Design linear and non linear applications of OP – AMPS
C214.2	Design applications using analog multiplier and PLL
C214.3	Design ADC and DAC using OP – AMPS
C214.4	Generate waveforms using OP – AMP Circuits
C214.5	Analyze special function ICs
C215/ GE8291/ ENVIRONMENTAL SCIENCE AND ENGINEERING	
C215.1	Environmental Pollution or problems cannot be solved by mere laws. Public

	participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.
C215.2	Public awareness of environmental is at infant stage.
C215.3	Ignorance and incomplete knowledge has lead to misconceptions
C215.4	Development and improvement in std. of living has lead to serious environmental disasters
C215.5	Explain importance of women and child education and HIV /AIDS.
C216/ EC8461/ CIRCUITS DESIGN AND SIMULATION LABORATORY	
C216.1	Analyze various types of feedback amplifiers
C216.2	Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators
C216.3	Demonstrate the feedback amplifiers using SPICE Tool.
C216.4	Demonstrate the oscillators and tuned amplifiers using SPICE Tool.
C216.5	Demonstrate the voltage and current time base circuits using SPICE Tool.
C217/ EC8462/LINEAR INTEGRATED CIRCUITS LABORATORY	
C217.1	Design amplifiers, oscillators, D-A converters using operational amplifiers.
C217.2	Design filters using op-amp and performs an experiment on frequency response.
C217.3	Analyze the working of PLL and describe its application as a frequency multiplier.
C217.4	Design DC power supply using ICs.
C217.5	Analyze the performance of filters, multivibrators, A/D converter and analog multiplier using SPICE
Year/Semester: III/V	
C301/ EC8501/ DIGITAL COMMUNICATION	
C301.1	Design PCM systems
C301.2	Design and implement base band transmission schemes
C301.3	Design and implement band pass signaling schemes
C301.4	Analyze the spectral characteristics of band pass signaling schemes and their noise performance
C301.5	Design error control coding schemes
C302/ EC8553/ DISCRETE-TIME SIGNAL PROCESSING	
C302.1	Apply DFT for the analysis of digital signals and systems
C302.2	Design IIR and FIR filters
C302.3	Characterize the effects of finite precision representation on digital filters
C302.4	Design multirate filters
C302.5	Apply adaptive filters appropriately in communication systems
C303/ EC8552/ COMPUTER ARCHITECTURE AND ORGANIZATION	
C303.1	Describe data representation, instruction formats and the operation of a digital computer
C303.2	Illustrate the fixed point and floating-point arithmetic for ALU operation
C303.3	Discuss about implementation schemes of control unit and pipeline performance
C303.4	Explain the concept of various memories, interfacing and organization of multiple processors
C303.5	Discuss parallel processing technique and unconventional architectures
C304/ EC8551/ COMMUNICATION NETWORKS	
C304.1	Identify the components required to build different types of networks
C304.2	Choose the required functionality at each layer for given application

C304.3	Identify solution for each functionality at each layer
C304.4	Trace the flow of information from one node to another node in the network
C304.5	Analyze various routing algorithms
C305/ EC8073/ MEDICAL ELECTRONICS	
C305.1	Know the human body electro- physiological parameters and recording of bio-potentials
C305.2	Comprehend the non-electrical physiological parameters and their measurement – body temperature, blood pressure, pulse, blood cell count, blood flow meter etc.
C305.3	Interpret the various assist devices used in the hospitals viz. pacemakers, defibrillators, dialyzers and ventilators
C305.4	Comprehend physical medicine methods eg. ultrasonic, shortwave, microwave surgical diathermies , and bio-telemetry principles and methods
C305.5	Know about recent trends in medical instrumentation
C306/ OMD551/ BASICS OF BIOMEDICAL INSTRUMENTATION	
C306.1	Analyze and evaluate the effect of different diagnostic and therapeutic methods,their riskpotential, physical principles, opportunities and possibilities for different medical procedures
C306.2	Measure the various electrical signals from human system
C306.3	Examine biochemical and various physiological information.
C306.4	Describe the working of units which will help to restore normal functioning.
C306.5	Understand the position of biomedical instrumentation in modern Hospital care
C307/EC8562/ DIGITAL SIGNAL PROCESSING LAB	
C307.1	Carryout basic signal processing operations
C307.2	Demonstrate their abilities towards MATLAB based implementation of various DSP systems
C307.3	Analyze the architecture of a DSP Processor
C307.4	Design and Implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals
C307.5	Design a DSP system for various applications of DSP
C308/ EC8561/ COMMUNICATION SYSTEMS LAB	
C308.1	Simulate & validate the various functional modules of a communication system
C308.2	Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes
C308.3	Simulation of Convolutional coding scheme
C308.4	Simulation of ASK, FSK and BPSK detection schemes
C308.5	Simulate end-to-end communication Link
C309/ EC8563/ COMMUNICATION NETWORKS LAB	
C309.1	Communicate between two desktop computers
C309.2	Implement the different protocols
C309.3	Program using sockets.
C309.4	Implement and compare the various routing algorithms
C309.5	Use the simulation tool.
Year/Semester: III/VI	
C310/EC8691/MICROPROCESSORS AND MICROCONTROLLERS	

C310.1	Understand and execute programs based on 8086 microprocessor.
C310.2	Design Memory Interfacing circuits.
C310.3	Design and interface I/O circuits.
C310.4	Design and implement 8051 microcontroller based systems
C310.5	Analyze and learn Multiprocessor configurations, Introduction to advanced processors.
C311/EC8095 / VLSI DESIGN	
C311.1	Realize the concepts of digital building blocks using MOS transistor
C311.2	Design combinational MOS circuits and power strategies.
C311.3	Design and construct Sequential Circuits and Timing systems.
C311.4	Design arithmetic building blocks and memory subsystems.
C311.5	Apply and implement FPGA design flow and testing
C312/EC8652 / WIRELESS COMMUNICATION	
C312.1	Characterize a wireless channel and evolve the system design specifications
C312.2	Use various signaling schemes for wireless communication channels
C312.3	Compare the performance of channel using various propagation models
C312.4	Analyze the various mitigation techniques to address fading and interference in multipath propagation.
C312.5	Design MIMO Systems in fading and nonfading channels
C313/ MG8591 / PRINCIPLES OF MANAGEMENT	
C313.1	Identifies the global context for taking managerial organization.
C313.2	Predict the global opportunity that will impact the management of an organization.
C313.3	Prepare the management principles into management practices.
C313.4	Analyze the managerial problem with ethical practice standards.
C313.5	Breakdown the managerial task executed in the variety of circumstances.
C314/ GE8075 / INTELLECTUAL PROPERTY RIGHTS	
C314.1	Ability to manage Intellectual Property portfolio to enhance the value of the firm.
C314.2	Identify different types of Intellectual Properties (IPs), the right of ownership, scope ofprotection as well as the ways to create and to extract value from IP.
C314.3	Recognize the crucial role of IP in organizations of different industrial sectors for the purposes of product and technology development.
C314.4	Be able to anticipate and subject to critical analysis arguments relating to the development and reform of intellectual property right institutions and their likely impact on creativity and innovation.
C314.5	Be able to demonstrate a capacity to identify, apply and assess ownership rights and marketing protection under intellectual property law as applicable to information, ideas, new products and product marketing
C315/EC8651/ TRANSMISSION LINES AND RF SYSTEMS	
C315.1	Explain the characteristics of transmission lines and its losses
C315.2	About the standing wave ratio and input impedance in high frequency transmission lines
C315.3	Analyze impedance matching by stubs using smith charts
C315.4	Analyze the characteristics of TE and TM waves

C315.5	Design a RF transceiver system for wireless communication
C316/EC8681/MICROPROCESSORS AND MICROCONTROLLERS LABORATORY	
C316.1	Write ALP Programmes for fixed and Floating Point and Arithmetic operations
C316.2	Interface different I/Os with processor
C316.3	Generate waveforms using Microprocessors
C316.4	Explain the difference between simulator and Emulator
C316.5	Execute Programs in 8051
C317/EC8661VLSI DESIGN LABORATORY	
C317.1	Write HDL code for basic as well as advanced digital integrated circuit
C317.2	Import the logic modules into FPGA Boards
C317.3	Synthesize Place and Route the digital IPs
C317.4	Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDA tools
C317.5	Implementing strategies and basic architecture of leading FPGA and design steps
C318 /EC8611/TECHNICAL SEMINAR	
C318.1	Enrich the communication skills of the student technical topics of interest
C318.2	Familiarize the preparation of content of technical writing
C318.3	Enrich the presentations skills of the student technical topics of interest
C318.4	Participate confidently and appropriately in conversations both formal and informal
C318.5	Participate in technical group discussion.
C319 /HS8581/PROFESSIONAL COMMUNICATION	
C319.1	Take international examination such as IELTS and TOEFL
C319.2	Participate in Group Discussion.
C319.3	Successfully answer questions in Interviews.
C319.4	Make effective Presentation
C319.5	Participate confidently and appropriately in conversations both formal and informal
Year/Semester: IV/VII	
C401/ EC8701/ANTENNA AND MICROWAVE ENGINEERING	
C401.1	Apply the basic principles and evaluate antenna parameters and link power budgets
C401.2	Design and assess the performance of various antennas
C401.3	Design a microwave system given the application specifications
C401.4	Design a microwave system
C401.5	Design a various antennas
C402/ EC8751/ OPTICAL COMMUNICATION	
C402.1	Realize basic elements in optical fibers, different modes and configurations.
C402.2	Analyze the transmission characteristics associated with dispersion and polarization techniques.
C402.3	Design optical sources and detectors with their use in optical communication system.
C402.4	Construct fiber optic receiver systems, measurements and coupling techniques.
C402.5	Design optical communication systems and its networks.
	C403/ EC8791/ EMBEDDED AND REAL TIME SYSTEMS
C403.1	Describe the architecture and programming of ARM processor
C403.2	Outline the concepts of embedded systems

C403.3	Explain the basic concepts of real time operating system design
C403.4	Model real-time applications using embedded-system concepts
C403.5	Explain the concept of design methodologies techniques for embedded system.
C404/ EC8791/ AD HOC AND WIRELESS SENSOR NETWORKS	
C404.1	Know the basics of Ad hoc networks and Wireless Sensor Networks
C404.2	Apply this knowledge to identify the suitable routing algorithm based on the network and user requirement
C404.3	Apply the knowledge to identify appropriate physical and MAC layer protocols
C404.4	Understand the transport layer and security issues possible in Ad hoc and sensor networks.
C404.5	Be familiar with the OS used in Wireless Sensor Networks and build basic modules
C405/ EC 8791/ DISASTER MANAGEMENT	
C405.1	Differentiate the types of disasters, causes and their impact on environment and society
C405.2	Elaborate on the Principles of disasters management.
C405.3	Explain the application of modern techniques used in disaster mitigation and management.
C405.4	Assess vulnerability and various methods of risk reduction measures as well as mitigation.
C405.5	Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.
C406/ OSC752/ INTRODUCTION TO C PROGRAMMING	
C406.1	Develop simple applications using basic constructs
C406.2	Develop applications using arrays
C406.3	Develop applications using strings
C406.4	Develop applications using functions
C406.5	Develop applications using structures
C407/ EC 8711/ EMBEDDED LAB	
C407.1	Write programs in ARM for a specific Application
C407.2	Interface memory, A/D and D/A convertors with ARM system
C407.3	Analyze the performance of interrupt
C407.4	Write program for interfacing keyboard, display, motor and sensor.
C407.5	Formulate a mini project using embedded system
C408/ EC 8761/ ADVANCED COMMUNICATION LAB	
C408.1	Analyze the performance of simple optical link by measurement of losses and Analyzing the mode characteristics of fiber
C408.2	Analyze the wireless Channel Simulations
C408.3	Analyze the Eye Pattern, Pulse broadening of optical fiber and the impact on BER
C408.4	Estimate the Wireless Channel Characteristics and Analyze the performance of Wireless Communication System
C408.5	Understand the intricacies in Microwave System design
C409/ GE8076 / PROFESSIONAL ETHICS IN ENGINEERING	
C409.1	Understand the awareness on engineering ethics and human values.

C409.2	Install moral and social values and loyalty to the society.
C409.3	Able to appreciate the rights of others.
C409.4	Know the responsible experimenters and knowledge on balance outlook on law.
C409.5	Understand the safety, responsibilities and rights.
C410/ EC8094/ SATELLITE COMMUNICATION	
C410.1	Analyze the satellite orbits
C410.2	Analyze the earth segment
C410.3	Analyze the satellite Link design
C410.4	Design various satellite applications
C410.5	Analyze the space segment
C411/ EC8811/ PROJECT WORK	
C411.1	Identify the various components of electronics devices and systems.
C411.2	Understand the basic concepts of design and implementations.
C411.3	Design, analysis and simulate the electronic systems.
C411.4	Identify the applications of electronic systems.
C411.5	Innovate and apply for real time applications.

HOD/ECE

HEAD OF THE DEPARTMENT
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
M.A.M. SCHOOL OF ENGINEERING
SIRUGANUR, TIRUCHIRAPPALLI - 621 105

PRINCIPAL

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M.A.M. SCHOOL OF ENGINEERING
SIRIGANUR, TIRUCHIRAPPALLI-621 105.

Department of Mechanical Engineering

Programme Outcomes

PO1	An ability to apply knowledge of mathematics and engineering sciences to develop mathematical models for industrial problems.
PO2	An ability to identify, formulates, and solve complex engineering problems. with high degree of competence
PO3	An ability to design and conduct experiments, as well as to analyze and interpret data obtained through those experiments
PO4	An ability to design mechanical systems, component, or a process to meet desired needs within the realistic constraints such as environmental, social, political and economic sustainability
PO5	An ability to use modern tools, software and equipment to analyze multidisciplinary problems
PO6	An ability to demonstrate on professional and ethical responsibilities
PO7	An ability to communicate, write reports and express research findings in a scientific community
PO8	An ability to adapt quickly to the global changes and contemporary practices
PO9	An ability to engage in life-long learning

Programme Specific Outcomes – Mechanical Engineering

PSO 1	Ability to apply the concepts of Mechanical Engineering fields to design mechanical systems processes.
PSO 2	Ability to demonstrate professional and entrepreneurial skills to meet the industrial requirements.

HOD/MECH

Head of the Department
Mechanical Engineering
M.A.M. School of Engineering
Siruganur, Trichy-621 105.

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M.A.M. SCHOOL OF ENGINEERING
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M.A.M. SCHOOL OF ENGINEERING
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Siruganur, Trichy -621 105. www.mamse.in

DEPARTMENT OF MECHANICAL 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
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	
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
C108.2	The student will be able to analyze the physical principle involved in various
C108.3	Students will be able to understand different types of instruments for analyzing
C108.4	Students will be able to acquire hands-on knowledge in the quantitative
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
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
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
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	Analyze Partial Differential Equations in various methods.
C201.2	Solving Fourier Series for different types of functions.
C201.3	Computing the solutions of the heat equation, wave equation and the Laplace equation subject to boundary conditions
C201.4	Deduce the Gaussian function in Self reciprocal form using Fourier Transforms.
C201.5	Formation of finite difference method in Z-transforms.
C202/ME8391-ENGINEERING THERMODYNAMICS	
C202.1	Apply the basic concepts of thermodynamics for energy conversion phenomenon.
C202.2	Calculate thermal efficiency and coefficient of performance for heat engines, refrigerators and heat pumps.
C202.3	Evaluate the performance of steam power cycles.
C202.4	Derive simple thermodynamic relations of ideal and real gases.
C202.5	Calculate the properties of air vapor mixtures using psychometrics
C203/CE8394-FLUID MECHANICS AND MACHINERY	
C203.1	Apply the concept of fluid properties with their effects on fluid flow.
C203.2	Apply the concepts of general energy equations in fluid flow problems.
C203.3	Calculate the major and minor losses in flow through pipes.
C203.4	Apply the mathematical knowledge in boundary layer concepts.
C203.5	Understand the working principle of pumps and turbines.
C204/ME8351-MANUFACTURING TECHNOLOGY - I	
C204.1	Understand the fundamentals of casting, Welding, Forging and Sheet metal process
C204.2	Understand the basic concepts of Fusion and Non-Fusion Welding process
C204.3	Identify the different defects which occur in welding and casting process.
C204.4	Explain the various forming operations can performed in sheet metal process
C204.5	Compute the casting allowances and time taken for solidification in the process
C205/EE8353-ELECTRICAL DRIVES AND CONTROLS	

C205.1	Select the rating and classes of duty of machines for particular application.
C205.2	Explain the mechanical and braking characteristics of dc and ac machines.
C205.3	Describe the starting methods of both dc and ac machines.
C205.4	Clarify conventional and solid state speed control of dc drives.
C205.5	Enlighten the speed control of dc and ac drive by conventional and solid state methods.
C206/ME8361-MANUFACTURING TECHNOLOGY LABORATORY - I	
C206.1	Perform the taper turning operation in conventional lathe machine
C206.2	Perform the various thread operations for the given specification.
C206.3	Estimate the taper angle and machining time calculations in various machining operations.
C206.4	Perform the hexagonal bolts and square studs using shaper machine
C206.5	Calculate the eccentricity value to produce eccentric components
C207/ME8381-COMPUTER AIDED MACHINE DRAWING	
C207.1	Construct the machine drawing as per standards, Fits and Tolerances
C207.2	Identify proper computer graphics techniques for 2D drawing and 3D model.
C207.3	Develop the part model for any machine components by using modeling software.
C207.4	Develop the assembly model for machine components by using modeling software.
C207.5	Develop the program code for CNC machines for simulation
C208/EE8361-ELECTRICAL ENGINEERING LABORATORY	
C208.1	Perform the load test, OCC, load characteristics and speed control of DC shunt and DC series motor
C208.2	Perform the load test, OC and SC test on a single phase transformer
C208.3	Examine the regulation of an alternator by EMF and MMF methods
C208.4	Conduct the load test, speed control on various phase of induction motor
C208.5	Explore the DC and AC starters
C208.6	Perform the load test, OCC, load characteristics and speed control of DC shunt and DC series motor
C209/HS8381-INTERPERSONAL SKILLS / LISTENING & SPEAKING	
C209.1	Take international examination such as IELTS and TOEFL

C209.2	Participate in Group Discussion.
C209.3	Successfully answer questions in Interviews.
C209.4	Make effective Presentations.
C209.5	Participate confidently and appropriately in conversations both formal and informal
YEAR/SEMESTER : II/IV	
C210/MA8452-STATISTICS AND NUMERICAL METHODS	
C210.1	Define null and alternative hypothesis, Apply test statistic, level of significance and decision rule, Distinguish between Type I error and Type II errors to Explain the difference between one and two sided tailed of hypothesis.
C210.2	Explain the concept of analysis of variance to Distinguish between one and two factor analysis of variance tests.
C210.3	Solve Algebraic and Transcendental equations by various methods, Simultaneous linear equations using Direct and Indirect methods. Compute Eigen value of a matrix
	by power method.
C210.4	Interpret the data for Interpolation using various methods and compute the Numerical differentiation for Equal & Unequal intervals. Using Trapezoidal and Simpsons method for Numerical Integration solution.
C210.5	Solving first order differential equations using various types of single and multi step methods.
C211/ME8492-KINEMATICS OF MACHINERY	
C211.1	Understand the various kinematic concepts in different mechanisms.
C211.2	Analyze the velocity and acceleration of links at any point in various mechanisms.
C211.3	Construct the various cam profiles with follower motion.
C211.4	Solve the problems on gear and gear trains
C211.5	Recognize the effect of friction in different friction drives.
C212/ME8451-MANUFACTURING TECHNOLOGY– II	
C212.1	Understand the constructional features of lathe and special machines
C212.2	Explain the various mechanism used in special machines
C212.3	Develop the part program in CNC milling and turning centers.
C212.4	Compute the tool nomenclature and tool life calculation in metal cutting process

C212.5	Select the suitable grinding wheels used in different grinding process
C213/ME8491-ENGINEERING METALLURGY	
C213.1	Describe the various phase diagram for engineering metals
C213.2	Identify the different types of engineering materials in industrial applications
C213.3	Understand the various isothermal transformation in heat treatment process
C213.4	Understand the effects of alloying elements on Ferrous and Non-Ferrous materials.
C213.5	Discuss the properties and applications of Polymers, Ceramics and Composite materials
C214/ME8395-STRENGTH OF MATERIALS FOR MECHANICAL ENGINEERS	
C214.1	Understand the concept of deformation due to different loading conditions.
C214.2	Understand the fundamentals of various stresses and strains in the structural member.
C214.3	Construct the shear force and bending moment diagram for load transferring mechanism in different beams.
C214.4	Apply the basic equations to design the shaft and helical springs.
C214.5	Determine the slope and deflection in beams using different methods.
C215/ME8493-THERMAL ENGINEERING-I	
C215.1	Calculate the efficiency of various gas power cycles.
C215.2	Compute the performance test on IC engines
C215.3	Estimate the concert of single and multi stage steam turbines
C215.4	Apply the thermodynamic concepts in various thermal systems.
C215.5	Calculate the properties of air vapor mixtures using psychometrics
C216/ME8462-MANUFACTURING TECHNOLOGY LABORATORY–II	
C216.1	Calculate the various cutting forces using tool dynamometers.
C216.2	Generate gears using gear hobbling machines
C216.3	Perform surface finish operations using surface grinding and cylindrical grinding machines.
C216.4	Develop CNC part programming for turning and milling operations
C216.5	Perform contour milling operation in various milling machine.
C216.6	Perform gear cutting operation using milling machine.

C217/CE8381-STRENGTH OF MATERIALS & FLUID MECHANICS AND MACHINERY LABORATORY	
C217.1	Determine the elastic constants by using tensile and torsion test machine for mild steel (MS) specimen
C217.2	Conduct hardness test for different metals and carry out impact test for MS specimen
C217.3	Determine deflection in beams
C217.4	Determine the discharge coefficients for venture meter & Orifice meter
C217.5	Analyze the flow measurement by using flow measuring equipment
C218/HS8461-ADVANCED READING AND WRITING	
C218.1	Read and evaluate texts critically
C218.2	Make effective presentations
C218.3	Participate confidently and appropriately in conversations both formal and informal
C218.4	Write winning job applications.
C218.5	Display critical thinking in various professional contexts.
YEAR/SEMESTER : III/V	
C301/ME8595-THERMAL ENGINEERING-II	
C301.1	Understand the basic design parameters of various machine elements
C301.2	Understand the various stresses induce due to different loading conditions.
C301.3	Apply the basic design procedure to design the shafts, bearing and couplings.
C301.4	Apply the basic design steps to design the temporary and permanent joints.
C301.5	Design the various energy storing elements and engine components.
C302/ME8593-DESIGN OF MACHINE ELEMENTS	
C302.1	Understand the basic laws of heat transfer in the engineering systems.
C302.2	Compute the temperature distribution in steady and unsteady state heat conduction.
C302.3	Evaluate the heat transfer coefficient for convection
C302.4	Calculate the phase change properties and the heat exchanger performance by varying the methods
C302.5	Calculate radiation heat transfer between black and gray body surfaces.
C303/ME8501-METROLOGY AND MEASUREMENTS	
C303.1	Discuss the concepts of measurements in metrological instruments.

C303.2	Explain the principles of linear and angular measuring instruments for industrial applications.
C303.3	Understand the concepts of various computer aided inspection tools.
C303.4	Explain the different form measurements in industry.
C303.5	Understand the basic concepts of interchangeability and selective assembly.
C304/ME8594-DYNAMICS OF MACHINES	
C304.1	Understand the various force-motion relationships in different mechanisms
C304.2	Apply the principles of statics and dynamics to machinery
C304.3	Analyze the balancing masses in the rotating and reciprocating machines
C304.4	Solve the free vibration problems in longitudinal, transverse and torsional systems
C304.5	Apply the basic principles to reduce the undesirable effects of forced vibrations

C305/ OAI553- Production Technology of Agricultural machinery (Open Elective-1)	
C305.1	The students can able to apply the different manufacturing process and use this in industry for component production
C305.2	Industry for component production. Students will be able to understand the working principle of lathe and various
C305.3	Students will be able to gather idea on welding and soldering process
C305.4	Students will gain wide knowledge on various advance manufacturing process.
C305.5	Students will gain knowledge in CNC machine and improving the machining accuracy
C306/ME8511-KINEMATICS AND DYNAMICS LABORATORY	
C306.1	Understand the concept of differential gear trains and kinematic links
C306.2	Evaluate the frequency of the vibrating system
C306.3	Analyze the controlling mechanisms
C306.4	Analyze the balancing masses in the rotating and reciprocating machines
C306.5	Determination of mass moment of inertia for different component
C307/ME8512-THERMAL ENGINEERING LABORATORY	
C307.1	Conduct a test to find thermal conductivity of various engineering materials

C307.2	Measure the heat transfer rate in natural and forced convection environment
C307.3	Evaluate radiation heat transfer between black body surfaces and grey body surfaces
C307.4	Analyze the effectiveness of parallel and counter flow heat exchanger
C307.5	Compare the performance of theoretical and experimental refrigeration and air conditioning systems.
C308/ME8513-METROLOGY AND MEASUREMENTS LABORATORY	
C308.1	Ability to handle different measurement tools and perform measurements in quality impulsion
C308.2	Identify various gauges for measurement.
C308.3	Demonstrate linear and angular measurement using precision instruments.
C308.4	Apply the load cell to measure the force and torque
C308.5	Use thermocouple and comparator for taking measurement.
YEAR/SEMESTER : III/VI	
C310/ME8651-DESIGN OF TRANSMISSION SYSTEMS	
C310.1	Select the materials for mechanical transmission system.
C310.2	Apply the design knowledge to design the various flexible drives.
C310.3	Apply the design concepts to design the parallel axis mating gear.
C310.4	Apply the basic design steps to design the perpendicular and oblique axis mating gear.
C310.5	Apply the design procedure to design the gear box.
C311/ME8691-COMPUTER AIDED DESIGN AND MANUFACTURING	
C311.1	Understand the concept of 2D and 3D transformations and clipping algorithm.
C311.2	Understand the fundamentals of parametric curves, surfaces and Solids
C311.3	Apply the visual realism by using different algorithm
C311.4	Apply the mass property calculations on different parts
C311.5	Understand the different types of CAD Standards.
C312/ME8693-HEAT AND MASS TRANSFER	
C312.1	Understand the basic laws of heat transfer in the engineering systems.
C312.2	Compute the temperature distribution in steady and unsteady state heat conduction.
C312.3	Evaluate the heat transfer coefficient for convection

C312.4	Calculate the phase change properties and the heat exchanger performance by varying the methods
C312.5	Calculate radiation heat transfer between black and gray body surfaces.
C313/ME8692-FINITE ELEMENT ANALYSIS	
C313.1	Solve Boundary value problems in structural and non-structural application.
C313 .2	Apply finite element methods in one dimensional Problem.
C313 .3	Solve dynamic problem by using finite element procedure.
C313 .4	Apply finite element technique in two dimensional scalar Problems.
C313 .5	Apply finite element method in two dimensional Vector problems.
C314/ME8694-HYDRAULICS AND PNEUMATICS	
C314.1	Explain the Fluid power and operation of different types of pumps.
C314.2	Summarize the features and functions of Hydraulic motors, actuators and Flow control valves
C314.3	Explain the different types of Hydraulic circuits and systems
C314.4	Explain the working of different pneumatic circuits and systems
C314.5	Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems.
C315/ GE8075- INTELLECTUAL PROPERTY RIGHTS (Professional Elective-1)	
C315.1	Skill to understand the concept of intellectual property rights.
C315.2	Develops procedural knowledge to Legal System and solving the problem relating to Intellectual property rights
C315.3	Skill to pursue the professional programs in Company Secretary Ship, Law. Business (MBA), International Affairs, Public Administration and Other fields.
C315.4	Employability as the Compliance Officer, Public Relation Officer and Liaison Officer
C315.5	Establishment of Legal Consultancy and service provider.
C316/ME8681-C.A.D. / C.A.M. LABORATORY	
C316.1	Construct the machine drawing as per standards, Fits and Tolerances
C316.2	Identify proper computer graphics techniques for 2D drawing and 3D model.
C316.3	Develop the part model for any machine components by using modeling software.

C316.4	Develop the assembly model for machine components by using modeling software.
C316.5	Develop the program code for CNC machines for simulation
C317/ME8682-DESIGN AND FABRICATION PROJECT	
C317.1	Identify problems with their technical skills
C317.2	Design a product as per requirement
C317.3	Develop the detailed drawing for fabrication product with latest tool
C317.4	Create prototype of a working model
C317.5	Contribute effectively as an individual and as a member in a team
C318/HS8581-PROFESSIONAL COMMUNICATION	
C318.1	Make effective presentations
C318.2	Participate confidently in Group Discussions
C318.3	Attend job interviews and interacting in different situations.
C317.4	Write business reports, proposals and related correspondence.
C318.5	Develop adequate Soft Skills required for the workplace.
YEAR/SEMESTER : IV/VII	
C401/ME8792-POWER PLANT ENGINEERING	
C401.1	Understand the layout and components of various power plants
C401.2	Understand different types of cycles and it's efficiencies in various power plants.
C401.3	Understand the sources and concepts of renewable energy
C401.4	Calculate the factors associated with power plant economics.
C401.5	Select the suitability of site for a power plant.
C402/ME8793-PROCESS PLANNING AND COST ESTIMATION	
C402.1	Introduce the process planning concepts to make cost estimation for various products after process planning
C402.2	Identify the documents required for the process planning
C402.3	Calculate the material cost of a product.
C402.4	Explain the various associated in manufacturing shops.
C402.5	Calculate the machining time for various machining operations.

C403/ME8791-MECHATRONICS	
C403.1	Explain mechatronics design process
C403.2	Choose sensors based on their working principle.
C403.3	Discuss the working of various actuators.
C403.4	Discuss the architecture of microprocessors and microcontroller.
C403.5	Explain the architecture of PLC and contrast it from PC and relay systems.
C404/ OAN751 LOW COST AUTOMATION (Open Elective-2)	
C404.1	Upon completion of this course, the students can able to do low cost automation systems
C404.2	Students can do some assembly automation
C404.3	Can able to do automation using hydraulics
C404.4	Can able to do automation using pneumatics
C404.5	Students can able to do automation in electronics
C405/ ME8073 Unconventional Machining Processes (Professional Elective-2)	
C405.1	Apply the different UCMP for real time applications
C405.2	Analyze the various thermal energy and electrical energy based UCMP
C405.3	Integrate the chemical and electro-chemical energy based UCMP
C405.4	Apply the various nano abrasives based UCMP in industries.•
C405.5	Analyze the recent trend based unconventional machining processes
C406/ GE8071 Disaster Management (Professional Elective-3)	
C406.1	Differentiate the types of disasters, causes and their impact on environment and society
C406.2	Assess factors of vulnerability and its impacts.
C406.3	Knowledge of various methods of risk reduction measures as well as mitigation.
C406.4	Draw the hazard and vulnerability profile of India and Scenarious in the Indian context.

C406.5	Assess Disaster damage assessment and management
C407/ME8711-SIMULATION AND ANALYSIS LABORATORY	
C407.1	Simulate the dynamic system by using MAT lab software.
C407.2	Simulate the mechanism by using multi-body dynamic software
C407.3	Analyze the stresses for trusses and beams using analysis software
C407.4	Analyze the stresses for axis-symmetric components by using analysis software
C407.5	Analyze the response of vibrating system analysis software
C408/ME8781-MECHATRONICS LABORATORY	
C408.1	Simulate Hydraulic, Pneumatic circuit using software tool.
C408.2	Simulate Electro pneumatic circuits using trainer kits.
C408.3	Design and test various fluid power circuits using software tool
C408.4	Interface stepper motor with 8051micro controller
C408.5	Conduct experiments using servo controller and stepper motor.
C409/ME8712-TECHNICAL SEMINAR	
C409.1	Enrich the communication skills of the student technical topics of interest
C409.2	Familiarize the preparation of content of technical writing
C409.3	Enrich the presentations skills of the student technical topics of interest
C409.4	Participate confidently and appropriately in conversations both formal and informal
C409.5	Participate in technical group discussion.
YEAR/SEMESTER : IV/VIII	
C410/ME8591-PRINCIPLES OF MANAGEMENT	
C410.1	Identifies the global context for taking managerial organization.
C410.2	Predict the global opportunity that will impact the management of an organization.
C410.3	Prepare the management principles into management practices.
C410.4	Analyze the managerial problem with ethical practice standards.
C410.5	Breakdown the managerial task executed in the variety of circumstances.
C411/ MG8091 ENTREPRENEURSHIP DEVELOPMENT (Professional Elective– IV)	
C411.1	Gain knowledge and skills needed to run a business•
C411.2	Understanding the concept on entrepreneurial motivation•

C411.3	Formulate project proposals based on understanding on business environment.
C411.4	Evaluate accounting and financial aspects of business.
C411.5	Understanding on project funding and support agencies.
C412/ME8811-PROJECT WORK	
C412.1	Identify real world problems of core engineering and related systems
C412.2	Formulate new set of problems
C412.3	Take on with industrial changes
C412.4	Evaluate to obtain solution for problems in mechanical engineering systems
C412.5	Adapt to work as a team for the successful completion of the project

HOD/MECH

Head of the Department
Mechanical Engineering
M.A.M. School of Engineering
Siruganur, Trichy-621 105.

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M.A.M. SCHOOL OF ENGINEERING
SIRIGANUR, TIRUCHIRAPPALLI-621 105.

Department of Mechatronics Engineering
Programme Outcomes

PO1	Will be able to apply the laws of science and mathematics to provide engineering solutions to solve complex problems
PO2	Will be able to identify and analyze complex problems by modeling with the help of literature survey and validate the solution with experiments.
PO3	Will be able to design and develop Mechatronics systems by selecting and integrating, sensors, appropriate materials, mechanics, thermal systems, manufacturing and automation methods
PO4	Will be able to collect, condition monitor and interpret data to provide engineering solutions
PO5	Will be able to create applications, products as well as modernizing the existing systems by using latest tools and technologies.
PO6	Will be able to develop solutions for local and global requirements by applying engineering knowledge and professional ethics.
PO7	Will have professional values on environmental and energy consumption for sustainability.
PO8	Will be able to become a leader and contribute in a team with entrepreneurial qualities.
PO9	Will be able to interact effectively in both oral and written format
PO10	Will continuously update their knowledge and skills to meet the ever changing global needs.

Programme Specific Outcomes –Mechatronics Engineering

PSO 1	Analyze, design, and develop mechatronics system to solve complex engineering problems..
PSO 2	Adopt a multidisciplinary approach to solve real-world industrial problems.
PSO 3	Innovate and implement smart technology and industry 4.0 in mechatronics system.

HOD/MECHT
Head of the Department
Dept. of Mechatronics Engineering
M.A.M.School of Engineering
Siruganur, Tiruchirappalli-621 105.

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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

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Dept. of Mechatronics Engineering
M.A.M.School of Engineering
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PG REGULATIONS – 2017
DEPARTMENT OF POWER ELECTRONICS AND DRIVES
PROGRAM OUTCOMES

PO1: Acquire sound knowledge in power electronics and drives.

PO2: Analyse power electronics and drives related engineering problems and synthesize the information for conducting high level of research.

PO3: Think widely to offer creative and innovative solutions of engineering problems that are inconformity with social and environmental factors.

PO4: Extract the new methodologies by carrying out the literature survey, proper design and conduction of experiments, interpret and analyse the data to arrive at meaningful research methodologies in power electronics and drives.

PO5: Learn and apply modern engineering and IT tools to solve complex engineering problems related to power converters and electric drives.

PO6: Ability to form, understand group dynamics and work in inter-disciplinary groups in order to
achieve the goal.

PO7: Ability to communicate effectively in appropriate technical forums and understand the concepts and ideas to prepare reports, to make effective presentations.

PO8: Ability to update knowledge and skills through lifelong learning to keep abreast with the technological developments.

PO9: Follow the professional and research ethics, comprehend the impact of research and responsibility in order to contribute to the society.

PO10: Understand the leadership principles and subject oneself to introspection and take voluntary remedial measures for effective professional practice in the field of power electronics and electric drives.

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REGULATION – 2017 - PG
M.E POWER ELECTRONICS AND DRIVES
YEAR/SEMESTER: I/I

S.No	Course Outcome
P101-MA5155/APPLIED MATHEMATICS FOR ELECTRICAL ENGINEERS	
P101.1	Ability to apply the concepts of Linear programming in Electrical Engineering problems.
P101.2	Ability to achieve an understanding of the basic concepts of one dimensional random variables and apply in electrical engineering problems.
P101.3	Ability to familiarize the students in calculus of variations and solve problems using Fourier transforms associated with engineering applications.
P101.4	Ability to understand the matrix theory in electrical engineering problems.
P101.5	Ability to apply the concept of Fourier series in electrical engineering problems.
P102-PX5101/POWER SEMICONDUCTOR DEVICES	
P102.1	Able to improve power semiconductor device structures for adjustable speed motor control applications.
P102.2	Able to understand the static and dynamic characteristics of current controlled power semiconductor devices
P102.3	Able to understand the static and dynamic characteristics of voltage controlled power semiconductor devices
P102.4	Enable the students for the selection of devices for different power electronics applications
P102.5	Able to understand the control and firing circuit for different devices.
P103-PX5151/ANALYSIS OF ELECTRICAL MACHINES	
P103.1	Ability to have knowledge about the fundamentals of magnetic circuits, energy, force and torque of multi-excited systems.
P103.2	Ability to analyze the steady state and dynamic state operation of DC machine

	through mathematical modeling and simulation in digital computer.
P103.3	Ability to understand the theory of transformation of three phase variables to two phase variables.
P103.4	Ability to analyze the steady state and dynamic state operation of three-phase induction machines using transformation theory based mathematical modeling.
P103.5	Ability to analyze the steady state and dynamic state operation of three-phase synchronous machines using transformation theory based mathematical modeling
P104-PX5152/ANALYSIS AND DESIGN OF POWER CONVERTERS	
P104.1	Able to understand the electrical circuit concepts behind the different working modes of power converters so as to enable deep understanding of their operation.
P104.2	Able to acquire skills to derive the criteria for the design of power converters starting from basic fundamentals.
P104.3	Able to analyze and comprehend the various operating modes of different configurations of power converters.
P104.4	Able to design different power converters namely AC to DC, DC to DC and AC to AC converters.
P104.5	Ability to analyze the voltage controllers with R and R-L loads.
P105-IN5152/SYSTEM THEORY	
P105.1	Able to understand the fundamentals of physical systems in terms of its linear and nonlinear models.
P105.2	Able to find solution on representing systems in state variable form.
P105.3	Able to analysis on solving linear and non-linear state equations.
P105.4	Able to estimate the properties of linear systems such as controllability and observability.
P105.5	Able to study the stability analysis of systems using Lyapunov"s theory.
P106-IN5091/SOFT COMPUTING TECHNIQUES	
P106.1	Able to expose the concepts of feed forward neural networks.

P106.2	Able to provide adequate knowledge about feedback neural networks.
P106.3	Able to teach about the concept of fuzziness involved in various systems.
P106.4	Able to expose the ideas about genetic algorithm.
P106.5	Able t o provide adequate knowledge about of FLC and NN toolbox.
P107-PX5111/POWER ELECTRONICS CIRCUITS LABORATORY	
P107.1	Able to familiar with the digital tools used in generation of gate pulses for the power electronic switches.
P107.2	Able to implementing analog interfacing as well as control circuits used in a closed-loop control for power electronic system.
P107.3	Able to acquire knowledge on mathematical modeling of power electronic circuits and implementing the same using simulation tools.
P107.4	Able to design and fabricate a power converter circuits at appreciable voltage/power levels.
P107.5	Able to develop skills on PCB design and fabrication.

YEAR/SEMESTER : I/II

S.No	Course Outcome
P108- PX5201/ANALYSIS AND DESIGN OF INVERTERS	
P108.1	Able to understand the concepts behind the different working modes of inverters so as to enable deep understanding of their operation.
P108.2	Able to acquire skills to derive the criteria for the design of power converters for UPS, Drives etc.,
P108.3	Able to analyze and comprehend the various operating modes of different configurations of power converters.
P108.4	Able to design different single phase and three phase inverters.
P108.5	Able to understand series and parallel resonant inverters.
P109- PX5202/SOLID STATE DRIVES	

P109.1	Able to understand various operating regions of the induction motor drives.
P109.2	Able to study and analyze the operation of VSI & CSI fed induction motor control.
P109.3	Able to understand the speed control of induction motor drive from the rotor side.
P109.4	Able to understand the field oriented control of induction machine.
P109.5	Able to understand the control of synchronous motor drives.
P110- PX5251/SPECIAL ELECTRICAL MACHINES	
P110.1	Able to review the fundamental concepts of permanent magnets and the operation of permanent magnet brushless DC motors.
P110.2	Able to introduce the concepts of permanent magnet brushless synchronous motors and synchronous reluctance motors.
P110.3	Able to develop the control methods and operating principles of switched reluctance motors.
P110.4	Able to introduce the concepts of stepper motors and its applications.
P110.5	Able to understand the basic concepts of other special machines.
P111-PX5252/POWER QUALITY	
P111.1	Able to understand the various power quality issues.
P111.2	Able to understand the concept of power and power factor in single phase and three phase systems supplying non linear loads
P111.3	Able to understand the conventional compensation techniques used for power factor correction and load voltage regulation.
P111.4	Able to understand the active compensation techniques used for power factor correction.
P111.5	Able to understand the active compensation techniques used for load voltage regulation.
P112-PX5003/FLEXIBLE AC TRANSMISSION SYSTEMS	

P112.1	Able to expose the concepts of feed forward neural networks.
P112.2	Able to provide adequate knowledge about feedback neural networks.
P112.3	Able to teach about the concept of fuzziness involved in various systems.
P112.4	Able to expose the ideas about genetic algorithm.
P112.5	Able t o provide adequate knowledge about of FLC and NN toolbox.
P113-PS5071/DISTRIBUTED GENERATION AND MICROGRID	
P113.1	Able to illustrate the concept of distributed generation.
P113.2	Able to analyze the impact of grid integration.
P113.3	Able to understand the concept of Micro grid and its configuration.
P113.4	Able to know the power electronics interfaces in DC and AC microgrids.
P113.5	Able to study the power quality issues in micogrids.
PX5003 FLEXIBLE AC TRANSMISSION SYSTEMS	
P114.1	Ability to understand the operation of the compensator and its applications in power system.
P114.2	Ability to understand the various emerging Facts controllers.
P114.3	Ability to know about the genetic algorithm used in Facts controller coordination.
P114.4	Ability to understand learn the characteristics, applications and modelling of series and shunt FACTS controllers.
P114.5	Ability to analyze the interaction of different FACTS controller and perform control coordination
ET5091 MEMS TECHNOLOGY	

P115.1	Understand basics of microfabrication, develop models and simulate electrostatic and electromagnetic sensors and actuators
P115.2	Understand material properties important for MEMS system performance, analyze dynamics of resonant micromechanical structures
P115.3	The learning process delivers insight onto design of micro sensors, embedded sensors & actuators in power aware systems like grid.
P115.4	Understand the design process and validation for MEMS devices and systems, and learn the state of the art in optical microsystems
P115.5	Improved Employability and entrepreneurship capacity due to knowledge up gradation on recent trends in embedded systems design.
P114-PX5211/ELECTRICAL DRIVES LABORATORY	
P116.1	Able to design and analyze the various DC and AC drives.
P116.2	Able to generate the firing pulses for converters and inverters using digital processors.
P116.3	Able to design of controllers for linear and nonlinear systems.
P116.4	Able to implement of closed loop system using hardware simulation.
P116.5	Able to design Cycloconverter fed Induction motor drives.
P115-PX5212/MINI PROJECT	
P117.1	Able to solve a specific problem right from its identification and literature review till the successful solution of the same.
P117.2	Able to acquire practical knowledge within the chosen area of technology for project development.
P117.3	Able to Identify, analyze, formulate and handle programming projects with a comprehensive and systematic approach.
P117.4	Able to contribute as an individual or in a team in development of technical projects.
P117.5	Able to develop effective communication skills for presentation of project related activities.

YEAR/SEMESTER:II/III

S.No	Course Outcome
P201-PS5092/SOLAR AND ENERGY STORAGE SYSTEMS	
P201.1	Able to know the characteristics of sunlight and their properties.
P201.2	Able to Study about solar modules and PV system design and their applications.
P201.3	Able to Deal with grid connected PV systems.
P201.4	Able to discuss about different energy storage systems.
P201.5	Able to find out the applications in water pumping, battery chargers and other solar cars etc.,
P202- PX5071/WIND ENERGY CONVERSION SYSTEMS	
P202.1	Able to learn the design and control principles of Wind turbine.
P202.2	Able to understand the concepts of fixed speed and variable speed, wind energy conversion systems.
P202.3	Able to analyze the grid integration issues.
P202.4	Able to understand the concept of variable speed systems.
P202.5	Able to know grid connected systems.
P203-PX5072/POWER ELECTRONICS FOR RENEWABLE ENERGY SYSTEMS	
P203.1	Able to Provide knowledge about the stand alone and grid connected renewable energy systems.
P203.2	Able to equip with required skills to derive the criteria for the design of power converters for renewable energy applications.
P203.3	Able to analyze and comprehend the various operating modes of wind electrical generators and solar energy systems.
P203.4	Able to design different power converters namely AC to DC, DC to DC and AC to AC converters for renewable energy systems.

P203.5	Able to develop maximum power point tracking algorithms.
P204-PX5311/Project Work Phase I	
P204.1	Identify the area and narrow dine the problems by using the existing journal references
P204.2	Identify and apply the real world and societal importance problems in the power systems and its allied area.
P204.3	Identify, analyze, design, implement projects with a complete and organized solution methodologies.
P204.4	Apply modern engineering tools for solution.
P204.5	Contribute as an individual of technical projects
P205-PX5411/Project Work Phase II	
P205.1	To design and develop the projects and creativity and choose the most appropriate option for the current project
P205.2	Effectively as a member of a project work
P205.3	To effectively communicate technical project information in writing or in personal presentation and conversation.
P205.4	Engaged in continuously learning the new practices, principles, and techniques of the electrical power industry.
P205.5	Contribute as an individual of technical projects and attend the conferences and apply projects in journals

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M.E. COMPUTER INTEGRATED MANUFACTURING

Regulation – 2017 - PG

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs) :

i. To train students with good scientific and engineering knowledge so as to comprehend, analyze, design, and create novel products and solutions for the real life problems

ii. To Impart knowledge to students in recent advances in the Computer Integrated Manufacturing Engineering to educate them to prosper in Manufacturing engineering and research related professions.

iii. To inculcate students with professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate Computer Integrated Manufacturing engineering issues to broader engineering and social context.

iv. To inculcate students in professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate Manufacturing engineering issues to broader social context.

v. To provide student with an academic environment aware of excellence, leadership, written ethical codes and guidelines, and the life-long learning needed for a successful professional career

PROGRAMME OUTCOMES:

1. Graduates will demonstrate knowledge of mathematics, science and engineering.
2. Graduates will demonstrate an ability to identify, formulate and solve engineering problems.
3. Graduate will demonstrate an ability to design and conduct experiments, analyze andinterpret data.
4. Graduates will demonstrate an ability to design a system, component or process as perneeds and specifications.
5. Graduates will demonstrate an ability to visualize the laboratory
6. Graduate will demonstrate skills to use modern engineering tools, software and equipment toanalyze problems.
7. Graduates will demonstrate knowledge of professional and ethical responsibilities.
8. Graduate will be able to communicate effectively in both verbal and written form.
9. Graduate will show the understanding of impact of engineering solutions on the society andalso will be aware of contemporary issues.
10. Graduate will develop confidence for self education and ability for life-long learning.

Head of the Department
Mechanical Engineering
M.A.M. School of Engineering
Siruganur, Trichy-621 105

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M.E. COMPUTER INTEGRATED MANUFACTURING

Regulation – 2017 - PG

YEAR/SEMESTER : I/I	
S.No	**Course Outcome**
C101/ MA5156 APPLIED MATHEMATICS FOR ENGINEERS	
C101.1	Apply various methods in matrix theory to solve system of linear equations.
C101.2	Maximizing and minimizing the functional that occur in various branches of engineering disciplines
C101.3	Computation of probability and moments,
C101.4	Understand the concepts of standard distributions of discrete and continuous random variables and functions of a random variable
C101.5	Application of Laplace and Fourier transforms to initial value, initial–boundary value and boundary value problems in Partial Differential Equations
C102/ CM5101 CNC MACHINES	
C102.1	Understand and Apply the Design and Drafting, Tolerance Techniques
C102.2	Execute the Processes to relate the Design and Manufacturing ,Networking Techniques and Process Planning Approaches.
C102.3	To Know the Constructional Features Of CNC Machines also aware of Multi Axis Machines and Tool Breakage Detecting System
C102.4	Generate Manual part programming for CNC turning and machining centre and CNC program using CAM software
C102.5	Analysis of cutting tool materials and tooling system for CNC Machining centre
C103/ ED5151 COMPUTER APPLICATIONS IN DESIGN	
C103.1	It helps the students to get familiarized with the computer graphics application in design
C103.2	This understanding reinforces the knowledge being learned and shortens the overall learning curve which is necessary to solve CAE problems that arise in engineering.
C103.3	Introduction to parametric and variational geometry based software's and their principles
C103.4	Aware of Regularized Boolean set operations and user interface for solid modeling.
C103.5	To know the Assembly of parts and product data exchange
C104/ CM5102 ADVANCES IN MANUFACTURING TECHNOLOGY	
C104.1	To produce useful research output in machining of various material
C104.2	Use this knowledge to develop hybrid machining techniques

C104.4	To Use the concepts of Micro machining and Nano fabrication
C104.5	Understanding of Rapid Prototyping and Surface modification techniques
	C105/ MR5391 INDUSTRIAL ROBOTICS
C105.1	Understanding of the Robot Kinematics.
C105.2	Ability to design robots and robotic work cells
C105.3	Ability to write program for controlling the robots
C105.4	Awareness to apply artificial intelligence and expert systems in robotics
C105.5	Understanding of Pattern recognition in Robot Sensors
	C106/ CM5091 ADDITIVE MANUFACTURING (Professional Elective-I)
C106.1	learn about a variety of Additive Manufacturing (AM) technologies, their potential to support design and manufacturing
C106.2	To aware of Data Processing for Rapid Prototyping
C106.3	Understanding of Liquid Based And Solid Based Additive Manufacturing Systems
C106.4	Understanding of Powder Based Additive Manufacturing Systems
C106.5	To aware of an important research challenges associated with AM and its data processing tools
	C107/ CM5111 CIM LABORATORY I
C107.1	Assembly of mechanical components using CAD software SolidWorks/CATIA/Pro-E
C107.2	Finite Element Analysis (FEA) using Pre-processing (solid modeling, meshing, analysis setup) and post processing (graphical display and report) with software PATRAN/ NASTRAN/ MARC/ ABAQUS/ LS-DYNA/ ANSYS/PAM-CRASH (Exercises include Simple Beam, Plane Stress, Strain, axi-symmetric, 3D Solids)
C107.3	CNC code generation for CNC Milling
C107.4	CNC code generation for CNC Turning
C107.5	Demonstration of CNC Router Machine/ CNC Lathe/ CNC Milling
	C110/ CM5201 COMPETITIVE MANUFACTURING
C110.1	Understanding of Various Automation of manufacturing process
C110.2	Aware of Group Technology & Flexible manufacturing systems
C110.3	Implementation of Lean Manufacturing
C110.4	To Know the Characteristics of Just In Time
C110.5	Aware of the pace of changes in the manufacturing technology
	C111/CM5202 APPLIED MATERIALS ENGINEERING
C111.1	Ability to select the materials for Engineering applications by understanding basic mechanical properties of materials

C111.2	Understanding the relation of the microstructure and mechanical properties
C111.3	To Know the processing techniques for controlling shape and properties in the final product and able to work in R&D activity in the field of materials science
C111.4	Aware of Modern materials and treatment
C111.5	Understanding of Primary and Secondary processes

C112 CM5203 COMPUTER INTEGRATED PRODUCTION SYSTEMS	
C112.1	To manage efficiently various activities of production with the help of technology
C112.2	Expected to use modern technologies in future management systems
C112.3	To Know the Basic MRP Concepts and their Applications
C112.4	To aware of the Functions of Shop Floor Control
C112.5	Understanding of Computer Process Monitoring and Control
C113/ CM5251 ADVANCES IN METROLOGY AND INSPECTION	
C113.1	Understanding of the Standards of measurement
C113.2	Operate sophisticated measurement and inspection facilities
C113.3	Design and develop new measuring methods
C113.4	Understand the advanced measurement principles with ease
C113.5	Ability to utilize the techniques in Computer imaging systems
C114/ CM5211 CIM LABORATORY II)	
C114.1	Programmable Logic Control (PLC) using PLC software Keyence ladder builder and working of PLC trainer kit.
C114.2	Robot Programming
C114.3	Matlab Programming. (Matrix manipulations, plotting of functions and data, implementation of algorithms and creation of user interfaces)
C114.4	Inspection of mechanical components using Video Measuring System (VMS)
C114.5	Dimensional and Geometric measurements using Digital Height Gauge and Coordinate Measuring Machine (CMM).
C115/MF5071-LEAN MANUFACTURING	
C115.1	The student must have a clear understanding of manufacturing production, classification, and lean manufacturing techniques

C115.1	The student must have a clear understanding of manufacturing production, classification, and lean manufacturing techniques
C115.2	Understanding of the fundamental concepts of job requirements, 5S, and layouts in production and productive maintenance
C115.3	Ability to comprehend the JIT and Kanab implementation approaches with a pull method
C115.4	Understanding of the Autonomy and Poke Yoke Processes in Lean Implementation
C115.5	The student is familiar with a variety of quality principles as well as a structured planning approach
C116/ CM5007- INTELLIGENT MANUFACTURING SYSTEMS	
C116.1	Apply various knowledge based techniques
C116.2	Practice building of intelligent systems
C116.3	Adopt intelligent system for Manufacturing
C116.4	Awareness for Building Of Knowledge Based Systems
C116.5	The role of Artificial Intelligence in the factory of the future Features of Experts systems
C117/MF5212-TECHNICAL SEMINAR	
C117.1	Develop reading, writing, comprehension, and presentation skills for research papers
C117.2	To assess the breadth of knowledge and coverage of recent areas of manufacturing engineering research
C117.3	To assess the consistency of presentation content (PPT/OHP) on recent manufacturing engineering research topics
C117.4	To improve the student's communication skills by presenting topics on recent engineering/technology advances
C117.5	To establish an analysis of current research problems and developments
YEAR/SEMESTER : II/III	
C201/ CM5094	**PROJECT MANAGEMENT (Professional Elective-IV)**
C201.1	To apply the various method of project selection and project organization
C201.2	To prepare the proper Project Planning schedule for the successful execution of the project
C201.3	To apply the various techniques for Project Implementation
C201.4	Controlling the ongoing project by monitoring based on the available information systems

C201.5	To take the action based on the auditing report , whether the project to be continued or to be terminated
C202/ CM5073- Green Manufacturing (Professional Elective-V)	
C202.1	To introduce the concept of Green Manufacturing Design
C202.2	By adopting Material recycling and material flow for achieving environmental life cycle assessment and Emission less manufacturing.
C202.3	To apply the green design methods for Mass balance analysis and to Green indicate
C202.4	To take correct decision in design for environment
C202.5	To apply the available recourses for sustainable economic environment
C203/ CM5018- Total Quality Systems and Engineering (Professional Elective-VI)	
C203.1	Understand the basics of Total Quality Systems and to apply it in Engineering
C203.2	Applying the various techniques for the practices of TQM
C203.3	To apply the various TQM techniques for Financial Control
C203.4	To improve the product / business quality by adopting proper DESIGNING
C203.5	To apply products liability for the achievement of product safety,by considering various applicable Laws
C204/CM5311-PROJECT PHASE - I	
C204.1	Choose a subject in Manufacturing Engineering's advanced areas. Determine how to conduct tests and what materials to use
C204.2	Review the literature to find differences and describe the work's goals and scoop
C204.3	Create and incorporate new social-benefit concepts
C204.4	Analyze and explain the findings in order to draw sound conclusions
C204.5	Restructure procedures with a focus on culture, the community, and ethics
YEAR/SEMESTER : II/IV	
C210/CM5411-PROJECT PHASE - II	
C210.1	Determine a subject in advanced Manufacturing Engineering. Determine experimental methods and materials
C210.2	Review the literature to find differences and describe the work's goals and scope
C210.3	Restructure procedures with a focus on culture, the community, and ethics
C210.4	Create and incorporate new social-benefit concepts
C210.5	Analyze and explain the findings in order to draw sound conclusions

Course Outcome	Programme Outcomes I & II YEAR PG SUBJECTS										PSOs	
	1	2	3	4	5	6	7	8	9	10	1	2
C101/ MA5156 APPLIED MATHEMATICS FOR ENGINEERS												
C101.1	3	2	-	-	-	-	-	-	-	-	2	2
C101.2	3	2	-	-	-	-	-	-	-	-	2	2
C101.3	3	2	-	-	-	-	-	-	-	-	2	2
C101.4	3	2	-	-	-	-	-	-	-	-	2	2
C101.5	3	2	-	-	-	-	-	-	-	-	2	2
C101.6	3	2	-	-	-	-	-	-	-	-	2	2
C102/ CM5101 CNC MACHINES												
C102.1	2	2	-	-	-	-	-	-	-	-	3	2
C102.2	3	2	-	-	-	-	-	-	-	-	3	2
C102.3	3	2	-	-	-	-	-	-	-	-	3	2
C102.4	3	3	-	-	-	-	-	-	-	-	3	2
C102.5	2	3	-	-	-	-	-	-	-	-	2	2
C103/ ED5151 COMPUTER APPLICATIONS IN DESIGN												
C103.1	3	2	2	-	-	-	-	-	-	-	3	3
C103.2	2	3	2	-	-	-	-	-	-	-	3	3
C103.3	2	2	2	-	-	-	-	-	-	-	2	2
C103.4	3	2	2	-	-	-	-	-	-	-	2	2
C103.5	2	2	2	-	-	-	-	-	-	-	2	2
C104/ CM5102 ADVANCES IN MANUFACTURING TECHNOLOGY												
C104.1	2	2	-	-	-	-	-	-	-	-	2	2
C104.2	2	2	-	-	-	-	-	-	-	-	2	2
C104.3	2	2	-	-	-	-	-	-	-	-	2	2
C104.4	2	2	-	-	-	-	-	-	-	-	2	2
C104.5	2	2	-	-	-	-	-	-	-	-	2	2
C105/ MR5391 INDUSTRIAL ROBOTICS												
C105.1	3	2	-	-	-	-	-	-	-	-	3	2
C105.2	2	2	-	-	-	-	-	-	-	-	2	2
C105.3	3	2	-	-	-	-	-	-	-	-	3	2
C105.4	3	2	-	-	-	-	-	-	-	-	3	2

C105.5	3	2	-	-	-	-	-	-	-	-	3	2
C106/ CM5091 ADDITIVE MANUFACTURING (Professional Elective-I)												
C106.1	3	3	2	-	-	-	-	-	-	-	2	2
C106.2	2	2	-	-	-	-	-	-	-	-	2	2
C106.3	2	2	-	-	-	-	-	-	-	-	2	2
C106.4	3	2	-	-	-	-	-	-	-	-	3	2
C106.5	3	3	-	-	-	-	-	-	-	-	3	3
C107/ CM5111 CIM LABORATORY I												
C107.1	3	3	3	-	3	-	-	-	-	-	3	3
C107.2	3	3	3	-	3	-	-	-	-	-	3	3
C107.3	3	3	3	-	3	-	-	-	-	-	3	3
C107.4	3	3	3	-	3	-	-	-	-	-	3	3
C107.5	3	3	3	-	3	-	-	-	-	-	3	3
C110/ CM5201 COMPETITIVE MANUFACTURING TURING												
C110.1	3	3	3	-	-	-	-	-	-	-	2	3
C110.2	3	3	3	-	-	-	-	-	-	-	2	3
C110.3	3	3	3	-	-	-	-	-	-	-	2	3
C110.4	3	3	3	-	-	-	-	-	-	-	2	3
C110.5	3	3	3	-	-	-	-	-	-	-	2	3
C111/CM5202 APPLIED MATERIALS ENGINEERING												
C111.1	2	2	-	-	-	-	-	-	-	-	2	2
C111.2	2	2	-	-	-	-	-	-	-	-	2	2
C111.3	2	2	-	-	-	-	-	-	-	-	2	2
C111.4	2	2	-	-	-	-	-	-	-	-	2	2
C111.5	2	2	-	-	-	-	-	-	-	-	2	2
C112 CM5203 COMPUTER INTEGRATED PRODUCTION SYSTEMS												
C112.1	3	2	-	-	-	-	-	-	-	-	3	2
C112.2	3	2	-	-	-	-	-	-	-	-	3	2
C112.3	3	2	-	-	-	-	-	-	-	-	3	2
C112.4	3	2	-	-	-	-	-	-	-	-	3	2
C112.5	3	2	-	-	-	-	-	-	-	-	3	2
C113/ CM5251 ADVANCES IN METROLOGY AND INSPECTION												
C113.1	2	2	3	-	-	-	-	-	-	-	3	2

C113.2	2	2	3	-	-	-	-	-	-	-	3	2
C113.3	2	2	3	-	-	-	-	-	-	-	3	2
C113.4	2	2	3	-	-	-	-	-	-	-	3	2
C113.5	2	2	3	-	-	-	-	-	-	-	3	2
C114/ CM5211 CIM LABORATORY II (Professional Elective-II)												
C114.1	2	2	-	-	-	-	-	-	-	-	2	2
C114.2	2	2	-	-	-	-	-	-	-	-	2	2
C114.3	2	2	-	-	-	-	-	-	-	-	2	2
C114.4	2	2	-	-	-	-	-	-	-	-	2	2
C114.5	2	2	-	-	-	-	-	-	-	-	2	2
C115/MF5071-LEAN MANUFACTURING (Professional Elective-III)												
C115.1	3	2	-	-	-	-	-	-	-	-	3	2
C115.2	3	2	-	-	-	-	-	-	-	-	3	2
C115.3	3	2	-	-	-	-	-	-	-	-	3	2
C115.4	3	2	-	-	-	-	-	-	-	-	3	2
C115.5	3	2	-	-	-	-	-	-	-	-	3	2
C116/ CM5007- INTELLIGENT MANUFACTURING SYSTEMS												
C116.1	3	3	3	-	-	-	-	-	-	-	3	3
C116.2	3	3	3	-	-	-	-	-	-	-	3	3
C116.3	3	3	3	-	-	-	-	-	-	-	3	3
C116.4	3	3	3	-	-	-	-	-	-	-	3	3
C116.5	3	3	3	-	-	-	-	-	-	-	3	3
C117/MF5212-TECHNICAL SEMINAR												
C117.1	3	3	2	2	3	-	-	-	-	-	3	2
C117.2	3	3	2	2	3	-	-	-	-	-	3	2
C117.3	3	3	2	2	3	-	-	-	-	-	3	2
C117.4	3	3	2	2	3	-	-	-	-	-	3	2
C117.5	3	3	2	2	3	-	-	-	-	-	3	2
C201/ CM5094 PROJECT MANAGEMENT (Professional Elective-IV)												
C201.1	3	3	-	-	-	-	-	-	-	-	3	2
C201.2	3	3	-	-	-	-	-	-	-	-	3	2
C201.3	3	3	-	-	-	-	-	-	-	-	3	2
C201.4	3	3	-	-	-	-	-	-	-	-	3	2

C201.5	3	3	-	-	-	-	-	-	-	-	3	2
C202/ CM5073- Green Manufacturing (Professional Elective-V)												
C202.1	2	3	2	-	-	-	-	-	-	-	2	2
C202.2	2	3	2	-	-	-	-	-	-	-	2	2
C202.3	2	3	2	-	-	-	-	-	-	-	2	2
C202.4	2	3	2	-	-	-	-	-	-	-	2	2
C202.5	2	3	2	-	-	-	-	-	-	-	2	2
C203/ CM5018- Total Quality Systems and Engineering (Professional Elective-VI)												
C203.1	2	2	-	-	-	-	-	-	-	-	2	2
C203.2	2	2	-	-	-	-	-	-	-	-	2	2
C203.3	2	2	-	-	-	-	-	-	-	-	2	2
C203.4	2	2	-	-	-	-	-	-	-	-	2	2
C203.5	2	2	-	-	-	-	-	-	-	-	2	2
C204/CM5311-PROJECT PHASE - I												
C204.1	3	3	3	3	3	2	3	2	3	3	3	3
C204.2	3	3	3	3	3	2	3	2	3	3	3	3
C204.3	3	3	3	3	3	2	3	2	3	3	3	3
C204.4	3	3	3	3	3	2	3	2	3	3	3	3
C204.5	3	3	3	3	3	2	3	2	3	3	3	3
C210/CM5411-PROJECT PHASE - II												
C210.1	3	3	3	3	3	2	3	2	3	3	3	3
C210.2	3	3	3	3	3	2	3	2	3	3	3	3
C210.3	3	3	3	3	3	2	3	2	3	3	3	3
C210.4	3	3	3	3	3	2	3	2	3	3	3	3
C210.5	3	3	3	3	3	2	3	2	3	3	3	3

HOD/MECH

PRINCIPAL