MAM SCHOOL OF ENGINEERING
SIRUGANUR, TRICHY-621105
PROGRAM OUTCOMES
B.E. AERONAUTICAL ENGINEERING (R – 2017)

PROGRAMME OUTCOMES:

- Ability to solve the engineering problems of mathematics, science and engineering

- An engineering acumen in identifying, formulating, analyzing and solving complex engineering problems.

- Developing processes, solutions to the problems which are safe socially, culturally and environmentally.

- Ability to model, analyze and simulate operations of aircraft components and parts.

- 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.

- Understanding of the impact of engineering solutions in a global, economic, environmental, and societal context

- 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.

- Commitment to professional ethics and responsibilities and norms as prescribed by the Aviation bodies such as DGCA etc.

- Ability to work in team and have practical exposure in modeling of UAV, hovercrafts etc.

- Ability to communicate effectively with the aerospace community using reports, presentations and documentations.

- Ability to manage the projects in various aerospace fields of structure, propulsion, avionics etc.

- A readiness to engage in lifelong learning and understanding of contemporary issues in aviation industry.

MAM SCHOOL OF ENGINEERING
SIRUGANUR, TRICHY-621105
<u>COURSE OUTCOMES</u>
B.E. AERONAUTICAL ENGINEERING (R – 2017)
I SEM

S.No	Sub code	Sub name	Outcomes
1	HS8251	TECHNICAL ENGLISH	☐ Read technical texts and write area- specific texts effortlessly. ☐ Listen and comprehend lectures and talks in their area of specialisation successfully. ☐ Speak appropriately and effectively in varied formal and informal contexts. ☐ Write reports and winning job applications.
2	MA8251	ENGINEERING MATHEMATICS – II	☐ Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices. ☐ Gradient, divergence and curl of a vector point function and related identities. ☐ Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification. ☐ Analytic functions, conformal mapping and complex integration. ☐ Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
3	PH8251	MATERIALS SCIENCE	☐ the students will have knowledge on the various phase diagrams and their applications ☐ the students will acquire knowledge on Fe-Fe3C phase diagram, various microstructures and alloys ☐ the students will get knowledge on mechanical properties of materials and their measurement ☐ the students will gain knowledge on magnetic, dielectric and superconducting properties of materials ☐ the students will understand the basics of ceramics, composites and nanomaterials.
4	BE8253	BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING	☐ Understand electric circuits and working principles of electrical machines ☐ Understand the concepts of various electronic devices ☐ Choose appropriate instruments for electrical measurement for a specific application
5	GE8291	ENVIRONMENTAL SCIENCE AND ENGINEERING	☐ 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. ☐ Public awareness of environmental is at infant stage. ☐ Ignorance and incomplete knowledge has lead to misconceptions ☐ Development and improvement in std. of living has lead to serious environmental disasters
6	GE8292	ENGINEERING MECHANICS	☐ illustrate the vectorial and scalar representation of forces and moments ☐ analyse the rigid body in equilibrium ☐ evaluate the properties of surfaces and solids ☐ calculate dynamic forces exerted in rigid body ☐ determine the friction and the effects by the laws of friction
7	GE8261	ENGINEERING PRACTICES LABORATORY	☐ fabricate carpentry components and pipe connections including plumbing works. ☐ use welding equipments to join the structures. ☐ Carry out the basic machining operations

			☐ Make the models using sheet metal works ☐ Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings ☐ Carry out basic home electrical works and appliances ☐ Measure the electrical quantities ☐ Elaborate on the components, gates, soldering practices.
8	BE8261	BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING LABORATORY	☐ Ability to determine the speed characteristic of different electrical machines ☐ Ability to design simple circuits involving diodes and transistors ☐ Ability to use operational amplifiers

II SEM

S.No	Sub code	Sub name	Outcomes
1	HS8251	TECHNICAL ENGLISH	☐ Read technical texts and write area- specific texts effortlessly. ☐ Listen and comprehend lectures and talks in their area of specialisation successfully. ☐ Speak appropriately and effectively in varied formal and informal contexts. ☐ Write reports and winning job applications.
2	MA8251	ENGINEERING MATHEMATICS – II	☐ Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices. ☐ Gradient, divergence and curl of a vector point function and related identities. ☐ Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification. ☐ Analytic functions, conformal mapping and complex integration. ☐ Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
3	PH8251	MATERIALS SCIENCE	☐ the students will have knowledge on the various phase diagrams and their applications ☐ the students will acquire knowledge on Fe-Fe3C phase diagram, various microstructures and alloys ☐ the students will get knowledge on mechanical properties of materials and their measurement ☐ the students will gain knowledge on magnetic, dielectric and superconducting properties of materials ☐ the students will understand the basics of ceramics, composites and nanomaterials.
4	BE8253	BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING	☐ Understand electric circuits and working principles of electrical machines ☐ Understand the concepts of various electronic devices ☐ Choose appropriate instruments for electrical measurement for a specific application
5	GE8291	ENVIRONMENTAL SCIENCE AND ENGINEERING	☐ 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. ☐ Public awareness of environmental is at infant stage. ☐ Ignorance and incomplete knowledge has lead to misconceptions ☐ Development and improvement in std. of living has lead to serious environmental disasters

6	GE8292	ENGINEERING MECHANICS	☐ illustrate the vectorial and scalar representation of forces and moments ☐ analyse the rigid body in equilibrium ☐ evaluate the properties of surfaces and solids ☐ calculate dynamic forces exerted in rigid body ☐ determine the friction and the effects by the laws of friction
7	GE8261	ENGINEERING PRACTICES LABORATORY	☐ fabricate carpentry components and pipe connections including plumbing works. ☐ use welding equipments to join the structures. ☐ Carry out the basic machining operations ☐ Make the models using sheet metal works ☐ Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings ☐ Carry out basic home electrical works and appliances ☐ Measure the electrical quantities ☐ Elaborate on the components, gates, soldering practices.
8	BE8261	BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATIO N ENGINEERING LABORATORY	☐ Ability to determine the speed characteristic of different electrical machines ☐ Ability to design simple circuits involving diodes and transistors ☐ Ability to use operational amplifiers

III SEM

S.No	Sub code	Sub name	Outcomes
1	MA8353	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	☐ Understand how to solve the given standard partial differential equations. ☐ Solve differential equations using Fourier series analysis which plays a vital role in engineering applications. ☐ Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations. ☐ 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. ☐ Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.
2	ME8392	MANUFACTURING TECHNOLOGY	The Students can able to use different manufacturing process and use this in industry for component production
3	AE8301	AERO ENGINEERING THERMODYNAMICS	☐ Able to relate laws of thermodynamics to jet engine components. ☐ Understands principle operation of piston engine and jet engines. ☐ Able to identify efficient cycle of air and jet engines. ☐ Capable to illustrate condition of working medium. ☐ Eligible to recognize and calculate heat transfer in complex systems involving several heat transfer mechanisms.
4	CE8394	FLUID MECHANICS AND MACHINERY	☐ Apply mathematical knowledge to predict the properties and characteristics of a fluid. ☐ Can analyse and calculate major and minor losses associated with pipe flow in piping networks. ☐ Can mathematically predict the nature of physical quantities ☐ Can critically analyse the performance of pumps ☐ Can critically analyse the performance of turbines.
5	CE8395	STRENGTH OF MATERIALS FOR	☐ Understand the concepts of stress and strain in simple and compound bars, the

		MECHANICAL ENGINEERS	importance of principal stresses and principal planes. ☐ Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment. ☐ Apply basic equation of simple torsion in designing of shafts and helical spring ☐ Calculate the slope and deflection in beams using different methods. ☐ Analyze and design thin and thick shells for the applied internal and external pressures.
6	AE8302	ELEMENTS OF AERONAUTICAL ENGINEERING	☐ Learn the history of aircraft & developments over the years ☐ Ability to identify the types & classifications of components and control systems ☐ Understand the basic concepts of flight & Physical properties of Atmosphere ☐ An ability to differentiate the types of fuselage and constructions. ☐ Different types of Engines and principles of Rocket
7	CE8381	STRENGTH OF MATERIALS AND FLUID MECHANICS & MACHINERY LABORATORY	Ability to perform Tension, Torsion, Hardness, Compression, and Deformation test on Solid materials. Perform Tension, Torsion, Hardness, Compression, and Deformation test on Solid materials. ☐ Use the measurement equipments for flow measurement. ☐ Perform test on different fluid machinery.
8	AE8311	THERMODYNAMICS LABORATORY	☐ Ability to perform test on diesel/petrol engine ☐ Ability to explain the characteristics of the diesel/Petrol engine ☐ Ability to determine the properties of the fuels.
9	HS8381	INTERPERSONAL SKILLS/LISTENING & SPEAKING	☐ Listen and respond appropriately. ☐ Participate in group discussions ☐ Make effective presentations ☐ Participate confidently and appropriately in conversations both formal and informal

IV SEM

S.No	Sub code	Sub name	Outcomes
1	MA8491	NUMERICAL METHODS	☐☐Understand the basic concepts and techniques of solving algebraic and transcendental equations. ☐ Appreciate the numerical techniques of interpolation and error approximations in various intervals in real life situations. ☐ Apply the numerical techniques of differentiation and integration for engineering problems. ☐ Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. ☐ Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.
2	AE8401	AERODYNAMICS - I	☐☐An ability to apply airfoil theory to predict airfoil performance ☐ Analyze and optimize wing performance ☐ A knowledge of incompressible flow ☐ A knowledge of subsonic wing theory ☐ Apply propeller theory to predict blade performance ☐ An exposure to Boundary layer theory

3	AE8402	AIRCRAFT SYSTEMS AND INSTRUMENTS	Compare the features of various flight control systems. Describe the principle and working of different aircraft systems. Analyze the performance of various aircraft engine systems. Acquire and interpret data from various aircraft instruments. Identify the various cockpit controls.
4	PR8451	MECHANICS OF MACHINES	Understand the principles in the formation of mechanisms and their kinematics. Understand the construction features of Gears and Gear Trains. Understand the effect of friction in different machine elements. Understand the importance of balancing. Understand the importance of Governors and Gyroscopic effects. Understand the importance of vibration.
5	AE8403	AIRCRAFT STRUCTURES - I	Ability to perform linear static analysis of determinate and indeterminate aircraft structural components Ability to design the component using different theories of failure Calculate the response of statically indeterminate structures under various loading conditions. Calculate the reactions of structures using strain energy concept. Create a structure to carry the given load. Examine the structural failures using failure theories
6	AE8404	PROPULSION – I	To be able to apply control volume and momentum equation to estimate the forces produced by aircraft propulsion systems To be able to describe the principal figures of merit for aircraft engine To be able to describe the principal design parameters and constraints that set the performance of gas turbine engines. To apply ideal and actual cycle analysis to a gas turbine engine to relate thrust and fuel burn to component performance parameters. 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.
7	ME8381	COMPUTER AIDED MACHINE DRAWING	CO1 Follow the drawing standards, Fits and Tolerances CO2 Re-create part drawings, sectional views and assembly drawings as per standards
8	AE8411	AERODYNAMICS LABORATORY	Describe the fundamental aerodynamic and geometrical properties related to external flows over airfoils, wings, and bluff bodies. Calculate the aerodynamic forces and moments experienced by airfoils, wings and bluff bodies. Use thin aerofoil theory to evaluate the performance of thin airfoils and the effects of angle of attack and camber. Use wind tunnel instrumentation to measure flow velocity and lift and drag. Visualize the flow and pressure distribution over 2D and 3D bodies by water flow and smoke methods.

V SEM

S.No	Sub code	Sub name	Outcomes
1	AE8501	Flight Dynamics	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. Have understanding about performance in level flight, minimum drag and power required, climbing, gliding and turning flight, v-n diagram and load factor. Knowledge about degrees of stability, stick fixed and stick free stability,

			stability criteria, effect of fuselage and CG location, stick forces, aerodynamic balancing. ☐ Understanding about lateral control, rolling and yawing moments, static directional stability, rudder and aileron control requirements and rudder lock. ☐ Understanding about dynamic longitudinal stability, stability derivatives, modes and stability criterion, lateral and directional dynamic stability.
2	AE8502	Aircraft Structures-II	☐ Ability to understand loads acting an aircraft. ☐ Ability to identify& resolve the structural design& its limitations . ☐ Ability to improvise distribution their loads on aircraft member with safer limits. ☐ Ability to understand the design of low weight to high strength panel member. ☐ Ability to analyze the aircraft real structural components such as wings and fuselage.
3	AE8503	Aerodynamics-II	☐☐Calculate the compressible flow through a duct of varying cross section. ☐ Use quasi one-dimensional theory to analyze compressible flow problems. ☐ Estimate fluid properties in Rayleigh and Fanno type flows. ☐ Estimate the properties across normal and oblique shock waves. ☐ Predict the properties of hypersonic flows.
4	AE8504	Propulsion-II	☐☐Understanding ramjet and hypersonic air breathing propulsion systems. ☐ To get familiarity in rocket propulsion systems. ☐ Knowing the applications and principles of liquid and solid-liquid propulsion systems. ☐ To gain knowledge about the advanced propulsion technique used for interplanetary mission.
5	AE8505	Control Engineering	☐☐Ability to apply mathematical knowledge to model the systems and analyse the frequency domain ☐ Ability to check the stability of the both time and frequency domain ☐ Ability to solve simple pneumatic, hydraulic and thermal systems, Mechanical and electrical component analogies based problems. ☐ Ability to solve the Block diagram representation of control systems, Reduction of block diagrams, Signal flow graph and problems based on it. ☐ Ability to understand the digital control system, Digital Controllers and Digital PID Controllers.
6	OAN551	Sensors and Transducer	CO1. Expertise in various calibration techniques and signal types for sensors. CO2. Apply the various sensors in the Automotive and Mechatronics applications CO3. Study the basic principles of various smart sensors. CO4. Implement the DAQ systems with different sensors for real time applications
7	AE8511	Aircraft Sructures Laboratory-II	☐☐students can understand the behavior of materials subjected to various types of loadings ☐ Students will be in a position to fabricate a composite laminates.
8	AE8512	Propulsion Laboratory-II	☐☐Capable to identify components and information of piston and gas turbine engine. ☐ Able to analyze behavior of flow through ducts and jet engine components. ☐ Ability to visualize flow phenomenon in supersonic flow. ☐ Recognizes performance parameters of rocket propellants. ☐ To be able to distinguish subsonic and supersonic flow characteristics. `
9	HS8581	Professional Communication	• Make effective presentations • Participate confidently in Group Discussions.

			• Attend job interviews and be successful in them. • Develop adequate Soft Skills required for the workplace

VI SEM

S.No	Sub code	Sub name	Outcomes
1	AE8601	Finite Element Methods	☐ Write flow chart of finite element steps and understand the convergence of the problem ☐ Solve stiffness matrix for bar, beam and frame problems using suitable boundary condition. ☐ Plane stress and plane strain condition are used to understand 2d structures. ☐ Modelling of 2d and 3d structures using isoparametric elements ☐ Apply the concepts of finite element methods to solve fluid flow and heat transfer problems.
2	AE8602	Experimental Aerodynamics	☐ Knowledge on measurement techniques in aerodynamic flow. ☐ Acquiring basics of wind tunnel measurement systems ☐ Specific instruments for flow parameter measurement like pressure, velocity. ☐ Use measurement techniques involved in Aerodynamic testing. ☐ Analyze the model measurements, Lift and drag measurements through various techniques and testing of different models. ☐ Apply the Wind tunnel boundary corrections and Scale effects
3	AE8603	Composite Materials and Structures	☐ Understanding the mechanics of composite materials ☐ Ability to analyse the laminated composites for various loading eases ☐ Knowledge gained in manufacture of composites. ☐ Should analyze sandwich and laminated plates ☐ Should be able to construct and analysis different composite technique
4	AE8604	Experimental Stress Analysis	☐ Knowledge of stress and strain measurements in loaded components. ☐ Acquiring information's the usage of strain gauges and photo elastic techniques of measurement . ☐ Formulate and solve general three dimensional problems of stress-strain analysis especially fundamental problems of elasticity. ☐ Analyze the strain gauge data under various loading condition by using gauge rosette method. ☐ Experimentally evaluate the location and size of defect in solid and composite materials by using various Non-destructive Testing methods.
5	AE8605	Aircraft Design	• Initiate the preliminary design of an aircraft starting from data collection to satisfy mission specifications; • To get familiarized with the estimation of geometric and design parameters of an airplane • 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. • Initiate the design of a system, component, or process to meet requirements for aircraft systems; • Complete the design of an aircraft to a level of sufficient detail to demonstrate that it satisfies given mission specifications • Work in a multidisciplinary environment involving the integration of engineering practices in such subjects as aerodynamics, structures, propulsion, and flight mechanics

S.No	Sub code	Sub name	Outcomes
6	AE8002	Aircraft General Engineering and Maintenance Practices	☐ Knowledge in various ground support system for aircraft operations ☐ Ability to carryout ground servicing of critical aircraft systems ☐ Knowledge in specifications standards of aircraft hardware systems. ☐ Grasp the ground handling procedures and types of equipments with special maintenance ☐ Ability to do shop safety, Environment cleanliness in an aircraft materials shop ☐ Understand the FAA airworthiness regulations and the checklist involved in each inspection of aircraft
7	AE8611	Aero Engine and Airframe Laboratory	Ability to maintain and repair the aero engines.
8	AE8612	Computer Aided Simulation Laboratory	☐ Ability to Mesh various geometries and to do grid independence study. ☐ Simulate and analyze fluid flow for internal and external flow problems. ☐ Analyze the basic mechanism of different structural elements behavior. ☐ Analyze the variation of mechanical properties over a composite beam. ☐ Analyze the apparent stress distribution over structural component
9	AE8613	Aircraft Design Project - I	☐ Upon completion of the Aircraft Design Project I students will be in a position to design aircraft and demonstrate the performance of the design.

VII SEM

S.No	Sub code	Sub name	Outcomes
1	GE8077	TOTAL QUALITY MANAGEMENT	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.
2	AE8751	AVIONICS	☐ Ability to built Digital avionics architecture ☐ Ability to Design Navigation system ☐ Ability to design and perform analysis on air system. ☐ Integrate avionics systems using data buses. ☐ Analyze the performance of various cockpit display technologies. ☐ Design autopilot for small aircrafts using MATLAB
3	ME8093	COMPUTATIONAL FLUID DYNAMICS	CO1 Derive the governing equations and boundary conditions for Fluid dynamics CO2 Analyze Finite difference and Finite volume method for Diffusion CO3 Analyze Finite volume method for Convective diffusion CO4 Analyze Flow field problems CO5 Explain the Turbulence models and Mesh generation techniques
4	OML751	Testing of Materials	1. Identify suitable testing technique to inspect industrial component 2. Ability to use the different technique and know its applications and limitations
5	AE8008	Vibration and Elements of Aeroelasticity	☐ Gaining understanding of single and multi degree vibrating systems ☐ Ability to use numerical techniques for vibration problems ☐ Knowledge acquired in aero elasticity and fluttering. ☐ Differentiate types of vibrations according to dampness and particle motion. ☐ Solve Rayleigh and Holzer method to find natural frequency of an object. ☐ Understand the formation of Aileron reversal, flutter and wing divergence.
6	AE8010	Fatigue and Fracture	☐ Ability to perform fatigue design ☐ Ability to analyse the fracture due to fatigue

			□ Analyze for cumulative damage due to fatigue. □ Analyze for crack initiation & crack growth. □ Analyze damage tolerant structures
7	AE8711	AIRCRAFT SYSTEMS LABORATORY	Ability to understand to procedure involved in maintenance of various air frame systems
8	AE8712	FLIGHT INTEGRATION SYSTEMS AND CONTROL LABORATORY	□ Ability to understand digital electronics circuits. □ Ability to use microprocessor in Flight control □ Ability to perform stability analysis
9	AE8713	AIRCRAFT DESIGN PROJECT - II	On completion of Aircraft design project II the students will be in a position to design aircraft wings, fuselage, loading gears etc., and also able to angle the design in terms of structural point of view.

S.NO	SUB CODE	SUB NAME	OUTCOMES
1	AE8012	WIND TUNNEL TECHNIQUES	• Understand the working principle of Blow down, In draft tunnels and their specifications • Knowledge about horizontal buoyancy, flow angularities while carrying out calibration • Understand the working principle of component axis balance and internal balances • Ability to carry out the smoke and tuft flow visualization procedures in WT testing
2	AE8018	AIR TRAFFIC CONTROL AND PLANNING	• Understanding the requirement of air traffic control systems and types of air traffic control system. Knowledge in flight information systems and rules of air traffic systems. • Knowledge indirection indicator systems for air navigation.
3	AE8811	PROJECT WORK	• On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

B.E. AERONAUTICAL ENGINEERING (R – 2013)
I Semester

S.No	Sub code	Sub name	Outcomes
1	HS6151	TECHNICAL ENGLISH – I	• To enable learners of Engineering and Technology develop their basic communication skills in English. • To emphasize specially the development of speaking skills amongst learners of Engineering and Technology. • To ensure that learners use the electronic media such as internet and supplement the learning materials used in the classroom. • To inculcate the habit of reading and writing leading to effective and efficient communication.
2	MA6151	MATHEMATICS – I	• This course equips students to have basic knowledge and understanding in one fields of materials, integral and differential calculus.
3	PH6151	ENGINEERING PHYSICS – I	• The students will have knowledge on the basics of physics related to properties of matter, optics, acoustics etc., and they will apply these fundamental principles to solve practical problems related to materials used for engineering applications.
4	CY6151	ENGINEERING CHEMISTRY - I	The knowledge gained on polymer chemistry, thermodynamics. spectroscopy, phase rule and nano materials will provide a strong platform to understand the concepts on these subjects for further learning.
5	GE6151	COMPUTER PROGRAMMING	At the end of the course, the student should be able to: • Design C Programs for problems. Write and execute C programs for simple applications dictionaries. ☐ Read and write data from/to files in Python Programs.
6	GE6152	ENGINEERING GRAPHICS	On Completion of the course the student will be able to • perform free hand sketching of basic geometrical constructions and multiple views of objects. • do orthographic projection of lines and plane surfaces. • draw projections and solids and development of surfaces. • prepare isometric and perspective sections of simple solids.

			• demonstrate computer aided drafting.
7	GE6161	COMPUTER PRACTICES LABORATORY	At the end of the course, the student should be able to: • Apply good programming design methods for program development. • Design and implement C programs for simple applications. • Develop recursive programs.
8	GE6162	ENGINEERING PRACTICES LABORATORY	• ability to fabricate carpentry components and pipe connections including plumbing works. • ability to use welding equipments to join the structures. • ability to fabricate electrical and electronics circuits.
9	GE6163	PHYSICS AND CHEMISTRY LABORATORY – I	• 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. • The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.
		II SEM	
1	HS6251	TECHNICAL ENGLISH II	Learners should be able to • Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative strategies. • Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing. • Read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation. • Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings. .
2	MA6251	MATHEMATICS – II	• The subject helps the students to develop the fundamentals and basic concepts in vector calculus, ODE, Laplace transform and complex functions. Students will be able to solve problems

			related to engineering applications by using these techniques.
			•
3	PH6251	ENGINEERING PHYSICS – II	• The students will have the knowledge on physics of materials and that knowledge will be used by them in different engineering and technology applications.
4	CY6251	ENGINEERING CHEMISTRY - II	• 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.
5	GE6252	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	• ability to identify the electrical components explain the characteristics of electrical machines. • ability to identify electronics components and use of them to design circuits.
6	GE6253	ENGINEERING MECHANICS	• ability to explain the differential principles applies to solve engineering problems dealing with force, displacement, velocity and acceleration. • ability to analyse the forces in any structures. • ability to solve rigid body subjected to dynamic forces.
7	GE6261	COMPUTER AIDED DRAFTING AND MODELING LABORATORY	• ability to use the software packers for drafting and modeling • ability to create 2D and 3D models of Engineering Components
8	GE6262	PHYSICS AND CHEMISTRY LABORATORY – II	• The students will have the ability to test materials by using their knowledge of applied physics principles in optics and properties of matter. • The students will be conversant with hands-on knowledge in the quantitative chemical analysis of water quality related parameters, corrosion measurement and cement analysis.

		III SEM	
1	MA6351	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	• The understanding of 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.
2	ME6352	MANUFACTURING TECHNOLOGY	• The Students can able to use different manufacturing process and use this in industry for component production
3	AE6301	AERO ENGINEERING THERMODYNAMICS	• Apply Mathematical foundations, principles in solving thermodynamics problems. • Critically analyse the problem, and solve the problems related to heat transfer and propulsion
4	CE6451	FLUID MECHANICS AND MACHINERY	• Upon completion of this course, the students can able to apply mathematical knowledge to predict the properties and characteristics of a fluid. • Can critically analyse the performance of pumps and turbines.
5	CE6452	SOLID MECHANICS	• Solve the problems related to the structural components under various loading conditions.
6	AE6302	ELEMENTS OF AERONAUTICS	• Identify the component of Flight • Identify suitable materials for Aircraft structure • Perform basic calculation on Mechanics using Newton law for lift, drag and moment.
7	CE6315	STRENGTH OF MATERIALS LABORATORY	• Ability to perform different destructive testing • Ability to characteristic materials
8	CE6461	FLUID MECHANICS AND MACHINERY LABORATORY	• Ability to use the measurement equipments for flow measurement • Ability to do performance trust on different fluid machinery
9	AE6311	THERMODYNAMICS LABORATORY	• Ability to perform test on diesel/petrol engine • Ability to explain the characteristics of the diesel/Petrol engine

			• Ability to determine the properties of the fuels.
10	AE6312	CAM AND MANUFACTURING LABORATORY	• Ability to design and model difficult aero component and perform structural analysis using available software packages
		IV SEM	
1	MA6459	NUMERICAL METHODS	• The students will have a clear perception of the power of numerical techniques, ideas and would be able to demonstrate the applications of these techniques to problems drawn from industry, management and other engineering fields.
2	AE6401	AERODYNAMICS - I	• An ability to apply airfoil theory to predict air foil perform • A knowledge of incompressible flow • An explosive to Boundary layer theory
3	AE6402	AIRCRAFT SYSTEMS AND INSTRUMENTS	• Know the operation of airplane control system, Engine system, Air conditioning and pressing system. • Know the operation of air data Instruments system
4	AT6302	MECHANICS OF MACHINES	• Upon completion of this course, the students can able to apply mathematical knowledge to predict the properties and characteristics of a fluid. • Can critically analyse the performance of pumps and turbines.
5	AE6403	AIRCRAFT STRUCTURES - I	• Ability to perform linear static analysis of determinate and indeterminate aircraft structural components • Ability to design the component using different theories of failure
6	AE6404	PROPULSION - I	• Ability to identify the engine components of jet propelled engines • Know the details of advanced Jet propulsion and hypersonic propulsion

7	AE6411	AIRCRAFT STRUCTURES LABORATORY - I	• Ability to perform non-destructive testing to predict the properties of metabolic materials used in aircraft application
8	AE6412	AERODYNAMICS LABORATORY	• Ability to use the fundamental dynamic principle in aircraft application.
9	AE6413	CAD AND AIRCRAFT COMPONENT DRAWING	• Ability to design and draw different joints and components using manual drafting method.
V SEM			
1	AE6501	FLIGHT DYNAMICS	• Ability to analyse the performance of aircraft under various Flight conditions such as take off, cruise, landing, climbing, glinding, turning and other maneuvers.
2	AE6502	AIRCRAFT STRUCTURES - II	• Ability to analyse the aircraft wings and fuselage • Ability to demonstrate the behavior of major aircraft structural components.
3	AE6503	AERODYNAMICS - II	• Understanding characterstics of fluid dlows • Knowledge gained in shock phenomenon and fluid waves. • understanding fluid flow characteristics over wings airfoils and airplanes. • Usage of wind tunnels for evaluating flow behaviours.
4	AE6504	PROPULSION - II	• Understanding various propulsion systems • Knowledge in rocket propulsion systems • Knowing the applications and principles of liquid and solid-liquid propulsion systems • Application of nuclear propulsion in rocketery
5	AE6505	CONTROL ENGINEERING	• Ability to apply mathematical knowledge to model the systems and analyse the frequency domain • Ability to check the stability of the both time and frequency domain
6	GE6351	ENVIRONMENTAL SCIENCE AND ENGINEERING	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. • Public awareness of environmental is at infant stage. • Ignorance and incomplete knowledge has lead to

			• misconceptions
			• Development and improvement in std. of living has lead to serious environmental disasters
			• Know the details of advanced Jet propulsion and hypersonic propulsion
7	AE6511	AIRCRAFT STRUCTURES LABORATORY - II	• Ability to perform Bending, Torsion, Shear, Vibration test on metabolic, composite specimen
8	AE6512	PROPULSION LABORATORY	• Ability to understand details of piston and gas turbine engine
			• Ability to perform various testing on ducts, propellants, jet engine components
9	GE6563	COMMUNICATION SKILLS – LABORATORY BASED	At the end of the course, learners should be able to • Take international examination such as IELTS and TOEFL • Make presentations and Participate in Group Discussions. • Successfully answer questions in interviews.

<table>
<tr><td colspan="4" align="center">VI SEM</td></tr>
<tr><td>1</td><td>MG6851</td><td>Principles of Management</td><td>• Upon completion of the course, students will be able to have clear understanding of managerial
• functions like planning, organizing, staffing, leading & controlling and have same basic
• knowledge on international aspect of management</td></tr>
<tr><td>2</td><td>AE6601</td><td>Finite Element Methods</td><td>• Upon completion of this course, the Students can able to understand different mathematical
• Techniques used in FEM analysis and use of them in Structural and thermal problem</td></tr>
<tr><td>3</td><td>AE6602</td><td>Vibrations and Elements of Aeroelasticity</td><td>• Gaining understanding of single and multi degree vibrating systems
• Ability to use numerical techniques for vibration problems
• Knowledge acquired in aero elasticity and fluttering</td></tr>
<tr><td>4</td><td>AE6603</td><td>Composite Materials and Structures</td><td>• Understanding the mechanics of composite materials
• Ability to analyse the laminated composites for various loading eases
• Knowledge gained in manufacture of composites</td></tr>
<tr><td>5</td><td>AE6604</td><td>Aircraft Materials and Processes</td><td>• Role of corrosion and heat treatment processes of aircraft materials
• Knowledge in usage of composite materials in aircraft component design.
• Exposure to high temperature materials for space applications</td></tr>
<tr><td>6</td><td>AE6002</td><td>Aircraft General Engineering and Maintenance Practices</td><td>• Knowledge in various ground support system for aircraft operations
• Ability to carryout ground servicing of critical aircraft systems</td></tr>
</table>

			• Knowledge in specifications standards of aircraft hardware systems.
7	AE6611	Aero Engine and Airframe Laboratory	Ability to maintain and repair the areo engines.
8	AE6612	Aircraft Design Project - I	Upon completion of the Aircraft Design Project I students will be in a position to design aircraft and demonstrate the performance of the design.
9	AE6613	Computer Aided Simulation Laboratory	Use of different simulation and analysis software to simulate flow behavior and perform structural analysis
		V IISEM	
1	GE6757	Total Quality Management	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.
2	AE6701	Avionics	• Ability to built Digital avionics architecture • Ability to Design Navigation system • Ability to design and perform analysis on air system
3	ME6014	Computational Fluid Dynamics	• To create numerical modeling and its role in the field of fluid flow and heat transfer • To use the various discretization methods, solution procedures and turbulence modeling to solve flow and heat transfer problems.
4	AE6702	Experimental Stress Analysis	• Knowledge of stress and strain measurements in loaded components. • Acquiring information's the usage of strain gauges and photo elastic techniques of measurement . • Knowledge in NDT in stress analysis
5	AE6007	Fatigue and Fracture	• Ability to apply mathematical knowledge to define fatigue behaviors • Ability to perform fatigue design • Ability to analyse the fracture due to fatigue
6	AE6010	Airframe Maintenance and Repair	• Ability to identify the airframe components • Ability to perform defect investigation skill to maintain the airframe
7	AE6711	Aircraft Design Project - II	On completion of Aircraft design project II the students will be in a position to design aircraft wings, fuselage, loading gears etc., and also able to angle the design in terms of structural point of view.
8	AE6712	Aircraft System Laboratory	Ability to understand to procedure involved in maintenance of various air frame systems
9	AE6713	Flight Integration Systems and Control Laboratory	• Ability to understand digital electronics circuits. • Ability to use microprocessor in Flight control • Ability to perform stability analysis

		VIII SEM	
1	AE6801	Wind Tunnel Techniques	• Ability to use various techniques of Aerodynamic data generation.
2	AE6015	Rockets and Missiles	• Knowledge in types of rockets and missiles with respect to Indian & international scenario • Gaining informations on aerodynamics of rocket and missiles • Knowledge on stages and remote control of rockets missiles
3	AE6811	PROJECT WORK	• On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

REGULATIONS – 2017
CHOICE BASED CREDIT SYSTEM

Educational Objectives

Bachelor of Electrical and Electronics Engineering curriculum is designed to prepare the graduates having attitude and knowledge to

1. Have successful technical and professional careers in their chosen fields such as circuit theory, Field theory, control theory and computational platforms.
2. Engross in life long process of learning to keep themselves abreast of new developments in the field of Electronics and their applications in power engineering.

Programme Outcomes

The graduates will have the ability to

a. Apply the Mathematical knowledge and the basics of Science and Engineering to solve the problems pertaining to Electronics and Instrumentation Engineering.

b. Identify and formulate Electrical and Electronics Engineering problems from research literature and be ability to analyze the problem using first principles of Mathematics and Engineering Sciences.

c. Come out with solutions for the complex problems and to design system components or process that fulfill the particular needs taking into account public health and safety and the social, cultural and environmental issues.

d. Draw well-founded conclusions applying the knowledge acquired from research and research methods including design of experiments, analysis and interpretation of data and synthesis of information and to arrive at significant conclusion.

e. Form, select and apply relevant techniques, resources and Engineering and IT tools for Engineering activities like electronic prototyping, modeling and control of systems and also being conscious of the limitations.

f. Understand the role and responsibility of the Professional Electrical and Electronics Engineer and to assess societal, health, safety issues based on the reasoning received from the contextual knowledge.

g. Be aware of the impact of professional Engineering solutions in societal and environmental contexts and exhibit the knowledge and the need for Sustainable Development.

h. Apply the principles of Professional Ethics to adhere to the norms of the engineering practice and to discharge ethical responsibilities.

i. Function actively and efficiently as an individual or a member/leader of different teams and multidisciplinary projects.

j. Communicate efficiently the engineering facts with a wide range of engineering community and others, to understand and prepare reports and design documents; to make effective presentations and to frame and follow instructions.

k. Demonstrate the acquisition of the body of engineering knowledge and insight and Management Principles and to apply them as member / leader in teams and multidisciplinary environments.

l. Recognize the need for self and life-long learning, keeping pace with technological challenges in the broadest sense.

Principal

B.E. ELECTRICAL AND ELECTRONICS ENGINEERING

PROGRAM EDUCATIONAL OBJECTIVES:

1. To prepare the students have successful career in industry and motivate for higher education.
2. To provide strong foundation in basic science and mathematics necessary to formulate, solve and analyze electrical and electronics problems
3. To provide strong foundation in circuit theory, field theory, control theory and signal processing concepts.
4. To provide good knowledge of Electrical power apparatus and their applications in power systems
5. To provide knowledge on basic electronics to power electronics and their applications in power engineering
6. To provide an opportunity to work in inter disciplinary groups
7. To promote student awareness for life long learning and inculcate professional ethics
8. To provide necessary foundation on computational platforms and software applications related to the respective field of engineering.

PROGRAM OUTCOMES:

a) Ability to understand and apply differential equations, integrals, matrix theory, probability theory and Laplace, Fourier and Z transformations for engineering problems
b) Ability to understand and apply basic science, circuit theory, Electro-magnetic field theory control theory and apply them to electrical engineering problems.
c) Ability to model and analyze electrical apparatus and their application to power system
d) Ability to understand and analyze power system operation, stability, control and protection.
e) Ability to handle the engineering aspects of electrical energy generation and utilization.
f) Ability to understand and analyse, linear and digital electronic circuits.
g) Ability to review, prepare and present technological developments
h) Ability to form a group and develop or solve engineering hardware and problems
i) To understand and apply computing platform and software for engineering problems.
j) To understand ethical issues, environmental impact and acquire management skills.

Principal

S.NO	YEAR/ SEM	SUB CODE	SUB NAMES	COURSE OUTCOME
1	I/I	HS8151	Communicative English	•Read articles of a general kind in magazines and newspapers. • Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English. • Comprehend conversations and short talks delivered in English • Write short essays of a general kind and personal letters and emails in English.
2	I/I	MA8151	Engineering Mathematics - I	□□Use both the limit definition and rules of differentiation to differentiate functions. □□Apply differentiation to solve maxima and minima problems. □□Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus. □□Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables. □□Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. □□Determine convergence/divergence of improper integrals and evaluate convergent improper integrals. □□Apply various techniques in solving differential equations.
3	I/I	PH8151	Engineering Physics	□□the students will gain knowledge on the basics of properties of matter and its applications, □□the students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics, □□the students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers, □□the students will get knowledge on advanced

				physics concepts of quantum theory and its applications in tunneling microscopes, and ☐☐the students will understand the basics of crystals, their structures and different crystal growth techniques.
4	I/I	CY8151	Engineering Chemistry	☐☐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.
5	I/I	GE8151	Problem Solving and Python Programming	☐☐Develop algorithmic solutions to simple computational problems ☐☐Read, write, execute by hand simple Python programs. ☐☐Structure simple Python programs for solving problems. ☐☐Decompose a Python program into functions. ☐☐Represent compound data using Python lists, tuples, dictionaries. ☐☐Read and write data from/to files in Python Programs.
6	I/I	GE8152	Engineering Graphics	☐☐familiarize with the fundamentals and standards of Engineering graphics ☐☐perform freehand sketching of basic geometrical constructions and multiple views of objects. ☐project orthographic projections of lines and plane surfaces. ☐draw projections and solids and development of surfaces. ☐visualize and to project isometric and perspective sections of simple solids.
7	I/II	HS8251	Technical English	☐Read technical texts and write area- specific texts effortlessly. ☐Listen and comprehend lectures and talks in their area of specialisation successfully. ☐Speak appropriately and effectively in varied formal and informal contexts. ☐Write reports and winning job applications.
8	I/II	MA8251	Engineering Mathematics – II	☐☐Eigenvalues and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive

				following after completing the course. □□Public awareness of environmental is at infant stage. □□Ignorance and incomplete knowledge has lead to misconceptions □□Development and improvement in std. of living has lead to serious environmental disasters
13	II/III	MA8353	Transforms and Partial Differential Equations	□□Understand how to solve the given standard partial differential equations. □□Solve differential equations using Fourier series analysis which plays a vital role in engineering applications. □□Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations. □□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. □□Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.
14	II/III	EE8351	Digital Logic Circuits	□□Ability to design combinational and sequential Circuits. □□Ability to simulate using software package. □□Ability to study various number systems and simplify the logical expressions using Boolean functions □□Ability to design various synchronous and asynchronous circuits. □□Ability to introduce asynchronous sequential circuits and PLDs □□Ability to introduce digital simulation for development of application oriented logic circuits.
15	II/III	EE8391	Electromagnetic Theory	□□Ability to understand the basic mathematical concepts related to electromagnetic vector fields. □□Ability to understand the basic concepts about electrostatic fields, electrical potential,

				definite matrices and similar matrices. ☐☐Gradient, divergence and curl of a vector point function and related identities. ☐☐Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification. ☐☐Analytic functions, conformal mapping and complex integration. ☐☐Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
9	I/II	PH8253	Physics for Electronics Engineering	☐☐gain knowledge on classical and quantum electron theories, and energy band structuues, ☐☐acquire knowledge on basics of semiconductor physics and its applications in various devices, ☐☐get knowledge on magnetic and dielectric properties of materials, ☐☐have the necessary understanding on the functioning of optical materials for optoelectronics, ☐☐understand the basics of quantum structures and their applications in spintronics and carbon electronics.
10	I/II	BE8252	Basic Civil and Mechanical Engineering	☐☐appreciate the Civil and Mechanical Engineering components of Projects. ☐☐explain the usage of construction material and proper selection of construction materials. ☐☐measure distances and area by surveying ☐☐identify the components used in power plant cycle. ☐☐demonstrate working principles of petrol and diesel engine. ☐☐elaborate the components of refrigeration and Air conditioning cycle.
11	I/II	EE8251	Circuit Theory	☐☐Ability to analyse electrical circuits ☐☐Ability to apply circuit theorems ☐☐Ability to analyse transients
12	I/II	GE8291	Environmental Science and Engineering	☐☐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

				energy power plants.
				☐ Explain the applications of power plants while extend their knowledge to power plant economics and environmental hazards and estimate the costs of electrical energy production.
19	II/IV	MA8491	Numerical Methods	☐☐Understand the basic concepts and techniques of solving algebraic and transcendental equations. ☐☐Appreciate the numerical techniques of interpolation and error approximations in various intervals in real life situations. ☐☐Apply the numerical techniques of differentiation and integration for engineering problems. ☐☐Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. ☐☐Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.
20	II/IV	EE8401	Electrical Machines – II	☐☐Ability to understand the construction and working principle of Synchronous Generator ☐☐Ability to understand MMF curves and armature windings. ☐☐Ability to acquire knowledge on Synchronous motor. ☐☐Ability to understand the construction and working principle of Three phase Induction Motor ☐☐Ability to understand the construction and working principle of Special Machines ☐☐Ability to predetermine the performance characteristics of Synchronous Machines.
21	II/IV	EE8402	Transmission and Distribution	☐☐To understand the importance and the functioning of transmission line parameters. ☐☐To understand the concepts of Lines and Insulators. ☐☐To acquire knowledge on the performance of Transmission lines.

				energy density and their applications. □□Ability to acquire the knowledge in magneto static fields, magnetic flux density, vector potential and its applications. □□Ability to understand the different methods of emf generation and Maxwell's equations □□Ability to understand the basic concepts electromagnetic waves and characterizing parameters □□Ability to understand and compute Electromagnetic fields and apply them for design and analysis of electrical equipment and systems
16	II/III	EE8301	Electrical Machines – I	□□Ability to analyze the magnetic-circuits. □□Ability to acquire the knowledge in constructional details of transformers. □□Ability to understand the concepts of electromechanical energy conversion. □□Ability to acquire the knowledge in working principles of DC Generator. □□Ability to acquire the knowledge in working principles of DC Motor □□Ability to acquire the knowledge in various losses taking place in D.C. Machines
17	II/III	EC8353	Electron Devices and Circuits	□□Explain the structure and working operation of basic electronic devices. □□Able to identify and differentiate both active and passive elements □□Analyze the characteristics of different electronic devices such as diodes and transistors □□Choose and adapt the required components to construct an amplifier circuit. □□Employ the acquired knowledge in design and analysis of oscillators
18	II/III	ME8792	Power Plant Engineering	□Explain the layout, construction and working of the components inside a thermal power plant. □ Explain the layout, construction and working of the components inside a Diesel, Gas and Combined cycle power plants. □ Explain the layout, construction and working of the components inside nuclear power plants. □ Explain the layout, construction and working of the components inside Renewable

				□□To understand the importance of distribution of the electric power in power system. □□To acquire knowledge on Underground Cabilitys □□To become familiar with the function of different components used in Transmission and Distribution levels of power system and modelling of these components.
22	II/IV	EE8403	Measurements and Instrumentation	□□To acquire knowledge on Basic functional elements of instrumentation □□To understand the concepts of Fundamentals of electrical and electronic instruments □□Ability to compare between various measurement techniques □□To acquire knowledge on Various storage and display devices □□To understand the concepts Various transducers and the data acquisition systems □□Ability to model and analyze electrical and electronic Instruments and understand the operational features of display Devices and Data Acquisition System.
23	II/IV	EE8451	Linear Integrated Circuits and Applications	□□Ability to acquire knowledge in IC fabrication procedure □□Ability to analyze the characteristics of Op-Amp □□To understand the importance of Signal analysis using Op-amp based circuits. □□Functional blocks and the applications of special ICs like Timers, PLL circuits, regulator Circuits. □□To understand and acquire knowledge on the Applications of Op-amp □□Ability to understand and analyse, linear integrated circuits their Fabrication and Application.
24	II/IV	IC8451	Control Systems	□□Ability to develop various representations of system based on the knowledge of Mathematics, Science and Engineering fundamentals. □□Ability to do time domain and frequency domain analysis of various models of linear system. □□Ability to interpret characteristics of the system to develop mathematical model. □□Ability to design appropriate compensator

				for the given specifications.
				☐☐Ability to come out with solution for complex control problem.
				☐☐Ability to understand use of PID controller in closed loop system.
25	III/V	EE6501	Power System Analysis	☐Ability to understand and analyze power system operation, stability, control and protection
26	III/V	EE6502	Microprocessors and Microcontrollers	☐Ability to understand and analyse, linear and digital electronic circuits. ☐To understand and apply computing platform and software for engineering problems
27	III/V	ME6701	Power Plant Engineering	☐Upon completion of this course, the Students can able to understand different types of power plant, and its functions and their flow lines and issues related to them. ☐Analyse and solve energy and economic related issues in power sectors
28	III/V	EE6503	Power Electronics	☐Ability to understand and analyse, linear and digital electronic circuits
29	III/V	EE6504	Electrical Machines - II	☐Ability to model and analyze electrical apparatus and their application to power system
30	III/V	IC6501	Control Systems	☐Ability to understand and apply basic science, circuit theory, theory control theory ☐Signal processing and apply them to electrical engineering problems
31	III/VI	EC6651	Communication Engineering	☐Ability to understand and analyse, linear and digital electronic circuits.
32	III/VI	EE6601	Solid State Drives	☐Ability to understand and apply basic science, circuit theory, Electro-magnetic field theory, control theory and apply them to electrical engineering problems
33	III/VI	EE6602	Embedded Systems	☐Ability to understand and analyze, linear and digital electronic circuits
34	III/VI	EE6603	Power System Operation and Control	☐Ability to understand and analyze power system operation, stability, control and protection
35	III/VI	EE6604	Design of Electrical Machines	☐Ability to model and analyze electrical apparatus and their application to power system
36	III/VI	EE6002	power system transients	☐ Ability to understand and analyze power system operation, stability, control and protection.
37	IV/VII	EE6701	High Voltage Engineering	☐ Ability to understand and analyze power system operation, stability, control and protection.

38	IV/VII	EE6702	Protection and Switchgear	☐ Ability to understand and analyze power system operation, stability, control and protection.
39	IV/VII	EE6703	Special Electrical Machines	☐ Ability to model and analyze electrical apparatus and their application to power system
40	IV/VII	MG6851	Principles of Management	☐ Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management
41	IV/VII	EI6703	Fibre Optics and Laser Instruments	☐ Ability to understand and analyze Instrumentation systems and their applications to various industries.
42	IV/VII	EE6007	Micro Electro Mechanical Systems	☐ Ability to understand the operation of micro devices, micro systems and their applications. ☐ Ability to design the micro devices, micro systems using the MEMS fabrication process.
43	IV/VIII	EE6801	Electric Energy Generation, Utilization and Conservation	☐ Ability to understand and analyze power system operation, stability, control and protection. ☐ Ability to handle the engineering aspects of electrical energy generation and utilization.
44	IV/VIII	EE6009	Power Electronics for Renewable Energy Systems	☐ Ability to understand and analyze power system operation, stability, control and protection. ☐ Ability to handle the engineering aspects of electrical energy generation and utilization.
45	IV/VIII	GE6757	Total Quality Management	☐ The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.

G. Purushothaman 23/07/18.

HoD/EEE

Principal

R-2017 PROGRAMME OUTCOMES:

a. Will be able to apply the laws of science and mathematics to provide engineering solutions to solve complex problems.

b. Will be able to identify and analyze complex problems by modeling with the help of literature survey and validate the solution with experiments.

c. Will be able to design and develop Mechatronics systems by selecting and integrating, sensors, appropriate materials, mechanics, thermal systems, manufacturing and automation methods.

d. Will be able to collect, condition monitor and interpret data to provide engineering solutions.

e. Will be able to create applications, products as well as modernizing the existing systems by using latest tools and technologies.

f. Will be able to develop solutions for local and global requirements by applying engineering knowledge and professional ethics.

g. Will have professional values on environmental and energy consumption for sustainability.

h. Will be able to become a leader and contribute in a team with entrepreneurial qualities.

i. Will be able to interact effectively in both oral and written format.

j. Will continuously update their knowledge and skills to meet the ever changing global needs.

S.No	Year/Sem	Sub Code	Subject Title	Course Outcome

1	First / I	HS8151	Communicative English	• Read articles of a general kind in magazines and newspapers.
				• Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English.
				• Comprehend conversations and short talks delivered in English
				• Write short essays of a general kind and personal letters and emails in English.
2	First / I	MA8151	Engineering Mathematics - I	• Use both the limit definition and rules of differentiation to differentiate functions.
				• Apply differentiation to solve maxima and minima problems.
				• Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
				• Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
				• Evaluate integrals using techniques of integration, such as substitution, partial fractions

				and integration by parts.
				• Determine convergence/divergence of improper integrals and evaluate convergent improper integrals.
				• Apply various techniques in solving differential equations.
3	First / I	PH8151	Engineering Physics	• the students will gain knowledge on the basics of properties of matter and its applications,
				• the students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics,
				• the students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers,
				• the students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes, and
				• the students will understand the basics of crystals, their structures and different crystal growth techniques.
4	First / I	CY8151	Engineering Chemistry	• 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.
5	First / I	GE8151	Problem Solving and Python Programming	• Develop algorithmic solutions to simple computational problems

• Read, write, execute by hand simple Python programs.

• Structure simple Python programs for solving problems.

• Decompose a Python program into functions.

• Represent compound data using Python lists, tuples, dictionaries.

• Read and write data from/to files in Python Programs. |
| 6 | First / I | GE8152 | Engineering Graphics | • familiarize with the fundamentals and standards of Engineering graphics

• perform freehand sketching of basic geometrical constructions and multiple views of objects.

• project orthographic projections of lines |

				and plane surfaces.
				• draw projections and solids and development of surfaces.
				• visualize and to project isometric and perspective sections of simple solids.
7	First / I	GE8261	Engineering Practices Laboratory	• fabricate carpentry components and pipe connections including plumbing works.
				• use welding equipments to join the structures.
				• Carry out the basic machining operations
				• Make the models using sheet metal works
				• Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings
				• Carry out basic home electrical works and appliances
				• Measure the electrical quantities
				• Elaborate on the components, gates, soldering practices.
8	First / I	BE8261	Basic Electrical, Electronics and	• Ability to determine the speed

			Instrumentation Engineering Laboratory	characteristic of different electrical machines
				• Ability to design simple circuits involving diodes and transistors
				• Ability to use operational amplifiers
9	First / II	HS8251	Technical English	• Read technical texts and write area-specific texts effortlessly.
				• Listen and comprehend lectures and talks in their area of specialisation successfully.
				• Speak appropriately and effectively in varied formal and informal contexts.
				• Write reports and winning job applications.
10	First / II	MA8251	Engineering Mathematics - II	• Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.
				• Gradient, divergence and curl of a vector point function and related identities.
				• Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.
				• Analytic functions, conformal mapping and complex integration.

				• Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
11	First / II	PH8251	Materials Science	• the students will have knowledge on the various phase diagrams and their applications • the students will acquire knowledge on Fe-Fe_3C phase diagram,various microstructures and alloys • the students will get knowledge on mechanical properties of materials and their measurement • the students will gain knowledge on magnetic, dielectric and superconducting properties of materials • the students will understand the basics of ceramics, composites and nanomaterials.
12	First / II	BE8253	Basic Electrical, Electronics and Instrumentation Engineering	• Understand electric circuits and working principles of electrical machines • Understand the concepts of various electronic devices • Choose appropriate instruments for

				electrical measurement for a specific application
13	First / II	GE8291	Environmental Science and Engineering	• 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. • Public awareness of environmental is at infant stage. • Ignorance and incomplete knowledge has lead to misconceptions • Development and improvement in std. of living has lead to serious environmental disasters
14	First / II	GE8292	Engineering Mechanics	• Illustrate the vectorial and scalar representation of forces and moments • Analyse the rigid body in equilibrium • Evaluate the properties of surfaces and solids • Calculate dynamic forces exerted in rigid body • Determine the friction and the effects by

				the laws of friction
15	First / II	GE8261	Engineering Practices Laboratory	• fabricate carpentry components and pipe connections including plumbing works. • use welding equipments to join the structures. • Carry out the basic machining operations • Make the models using sheet metal works • Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings • Carry out basic home electrical works and appliances • Measure the electrical quantities • Elaborate on the components, gates, soldering practices.
16	First / II	BE8261	Basic Electrical, Electronics and Instrumentation Engineering Laboratory	• Ability to determine the speed characteristic of different electrical machines • Ability to design simple circuits involving diodes and transistors • Ability to use operational amplifiers

| 17 | Second / III | MA8353 | Transforms and Partial Differential Equations | • Understand how to solve the given standard partial differential equations.

• Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.

• Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.

• 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.

• Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems. |
| 18 | Second / III | CE8395 | Strength of Materials for Mechanical Engineers | • Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes.

• Understand the load transferring |

				mechanism in beams and stress distribution due to shearing force and bending moment.
				• Apply basic equation of simple torsion in designing of shafts and helical spring
				• Calculate the slope and deflection in beams using different methods.
				• Analyze and design thin and thick shells for the applied internal and external pressures.
19	Second / III	CE8394	Fluid Mechanics and Machinery	• Apply mathematical knowledge to predict the properties and characteristics of a fluid.
				• Can analyse and calculate major and minor losses associated with pipe flow in piping networks.
				• Can mathematically predict the nature of physical quantities
				• Can critically analyse the performance of pumps
				• Can critically analyse the performance of turbines.
20	Second / III	EC8392	Digital Electronics	• Use digital electronics in the present contemporary world

				• Design various combinational digital circuits using logic gates • Do the analysis and design procedures for synchronous and asynchronous sequential circuits • Use the semiconductor memories and related technology • Use electronic circuits involved in the design of logic gates
21	Second / III	MT8301	Electrical Machines and Drives	• Get the basic knowledge about the Electric circuits and transformers. • Understand the various types of electrical motors. • Know about speed control and starting methods DC and induction motors • Understand about various types of electrical drives • Get exposure with solid state drives
22	Second / III	MT8302	Analog Devices and Circuits	• Apply the various switching devices in electronic circuits. • Work with various applications of

				amplifiers
				• Design various circuits using ICs.
				• Test and measure different parameters available in electronic circuits.
				• Explain the principles of various display devices.
23	Second / III	CE8381	Strength of Materials and Fluid Mechanics & Machinery Laboratory	• Ability to perform Tension, Torsion, Hardness, Compression, and Deformation test on Solid materials.
24	Second / III	MT8311	Electrical Machines and Drives Laboratory	• Test and assess the performances of the DC motors and single phase AC motor for varying load. • Control the speed of AC and DC motor. • Analyze and present the findings of experimental observations in both written and oral format.
25	Second / III	HS8381	Interpersonal Skills/Listening & Speaking	• Listen and respond appropriately. • Participate in group discussions • Make effective presentations • Participate confidently and appropriately in

				conversations both formal and informal
26	Second / IV	MA8452	Statistics and Numerical Methods	• Apply the concept of testing of hypothesis for small and large samples in real life problems. • Apply the basic concepts of classifications of design of experiments in the field of agriculture. • Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems. • Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. • Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications
27	Second / IV	ME8392	Manufacturing Technology	• The Students can able to use different manufacturing process and use this in industry for component production
28	Second / IV	MT8491	Microprocessors and Microcontrollers	• Distinguish the feature of the 8085 microprocessor, Hardware Architecture and

				PIN diagram.
				• Demonstrate programming proficiency using the various addressing modes and data transfer instructions of 8085 microprocessor
				• Acquaint the knowledge on architecture and programming of Microcontroller 8051.
				• Illustrate the interrupts handling and demonstrate peripherals applications in different IC and Know about A/D and D/A converters.
				• Apply the programming concepts to interface the hardware units with microprocessor and Microcontroller
29	Second / IV	ME8492	Kinematics of Machinery	• Discuss the basics of mechanism
				• Calculate velocity and acceleration in simple mechanisms
				• Develop CAM profiles
				• Solve problems on gears and gear trains
				• Examine friction in machine elements

30	Second / IV	MT8401	Thermodynamics and Heat Transfer	• Understand the basic concepts associated first law of thermodynamics • Understand basic concepts associated with second law of thermodynamics • Describing the working of I.C engines and to determine its performance parameters • Basic principles of refrigeration, air conditioning and psychometric chart • Distinguishing the various modes of heat transfer and its applications
31	Second / IV	MT8411	Microprocessor and Microcontrollers Laboratory	• Solve the arithmetic operations using microcontrollers and various on-chip and off-chip interfacing and algorithms. • Design the digital and analog hardware interface for microcontroller-based systems
32	Second / IV	ME8461	Manufacturing Technology Laboratory	• Ability to use different machine tools to manufacturing gears. • Ability to use different machine tools for finishing operations • Ability to manufacture tools using cutter grinder

				• Develop CNC part programming
33	Second / IV	ME8381	Computer Aided Machine Drawing	• Follow the drawing standards, Fits and Tolerances • Re-create part drawings, sectional views and assembly drawings as per standards
34	Second / IV	HS8461	Advanced Reading and Writing	• Write different types of essays. • Write winning job applications. • Read and evaluate texts critically. • Display critical thinking in various professional contexts

H.O.D

Principal

R-2013 MECHATRONICS PROGRAME OUTCOMES

S.No	Year/Sem	Sub Code	Subject Title	Course Outcome
1	THIRD / V	ME6503	Design of Machine Elements	• Upon completion of this course, the students can able to successfully design engine components
2	THIRD / V	EE6503	Power Electronics	• Ability to understand and analyse, linear and digital electronic circuits.
3	THIRD / V	MT6501	Sensors and Signal Processing	• The students will be able to use Sensors, various electrical and mechanical instruments in industries.
4	THIRD / V	GE6351	Environmental Science and Engineering	• Public awareness of environmental is at infant stage. • Ignorance and incomplete knowledge has lead to misconceptions • Development and improvement in std. of living has lead to serious environmental disasters
5	THIRD / V	MF6505	CNC Machining Technology	• Upon completion of this course the student and can to provide knowledge on principle, constructional features, programming, tooling and workholding devices in CNC machine tools
6	THIRD /	MT6502	Thermodynamics Principles and Applications	• The students will be able to apply the thermodynamics laws in the design of I.C engines , air

	V			conditioning and refrigeration equipments.
7	THIRD / V	MT6511	Power Electronics Laboratory	• Ability to use SCR, MOSFET, TRIAC in electronic circuit • Ability to perform characteristic study on the electronics components.
8	THIRD / V	MT6512	Sensors and Signal Processing Laboratory	• Ability to use the sensors for the measurement of different signals and use of signal processing techniques to convert them to useful signal.
9	THIRD / V	MT6513	CNC Laboratory	• Ability to write manual part programming using G code and M code for simple components • Ability to operate CNC controlled machine tools
10	THIRD / VI	MG6851	Principles of Management	• Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management
11	THIRD / VI	MT6601	Micro Controller and PLC	• The students will learn the theory, programming and application of microcontroller And design of systems using Programmable Logic Controllers

12	THIRD / VI	MT6602	Applied Hydraulics and Pneumatics	• The students will be able to operate and maintain various pneumatic and hydraulic systems in industrial environments.
13	THIRD / VI	MT6603	Design of Mechatronics System	• The students will be able to design systems in mechatronics approach using modern software packages.
14	THIRD / VI	MT6604	Object Oriented Programming in C++	• The students will be able to develop C++ programs for object oriented systems and test the systems
15	THIRD / VI	ELECTIVE MT6001	Advanced Manufacturing Technology	• Upon completion of this course, the students can able to use different manufacturing process and use this in industry for component production
16	THIRD / VI	GE6757	Total Quality Management	• The students will be able to implement various quality control procedures in manufacturing and service sectors including IT.
17	THIRD / VI	IT6502	Digital Signal Processing	• Perform frequency transforms for the signals. • Design IIR and FIR filters. • Finite word length effects in digital filters

18	THIRD / VI	IE6011	Product Design and Development	• The student will be able to design some products for the given set of applications; also the knowledge gained through prototyping technology will help the student to make a prototype of a problem and hence product design and development can be achieved.
19	THIRD / VI	MT6611	Micro Controller and PLC Laboratory	• Ability to use microcontroller and PLC to control different motor/equipment.
20	THIRD / VI	MT6612	Object Oriented Programming Laboratory	• Ability to develop applications using Object Oriented Programming Concepts. • Ability to implement features of object oriented programming to solve real world problems • Gain the basic knowledge on Object Oriented concepts
21	THIRD / VI	MT6613	Applied Hydraulics and Pneumatics Laboratory	• Ability to design and test hydraulic, pneumatic circuits • Use of MATLAB/LABVIEW software for simulation of hydraulic, pneumatic and electrical circuits.

22	FOUR / VII	MT6701	Medical Mechatronics	• The students will be ale to design , use and maintain various medical equipments
23	FOUR / VII	MT6702	Modeling and Simulation	• The students will be able to design and develop products using simulation techniques.
24	FOUR / VII	MT6703	Robotics and Machine Vision System	• Upon completion of this course, the students can able to apply the basic engineering knowledge for the design of robotics
25	FOUR / VII	ME6602	Automobile Engineering	• Upon completion of this course, the students will be able to identify the different components in automobile engineering. • Have clear understanding on different auxiliary and transmission systems usual.
26	FOUR / VII	ELECTIVE(II) MT6002	Diagnostic Techniques	• The students will be able to analyze the defects and rectify the faults. Also they will be able to monitor and maintain the equipment
27		MG6072	Marketing Management	• The learning skills of Marketing will enhance the knowledge about Marketer's Practices and create insights on Advertising, Branding, Retailing and

				Marketing Research.
28		MT6003	Engineering Economics and Cost Analysis	• The students will be able to carryout cost analysis for capital subjecting based on depreciation, money available , supply of material and demand of products.in their management profession.
29		ELECTIVE(III) MT6004	Industrial Electronics and Applications	• The students will be able to design various electronic industrial controllers
30		ME6501	Computer Aided Design	• Upon completion of this course, the students can able to use computer and CAD software's for modeling of mechanical components
31		IT6005	Digital Image Processing	• Discuss digital image fundamentals. • Apply image enhancement and restoration techniques. • Use image compression and segmentation Techniques. • Represent features of images.
32		EE6007	Micro Electro Mechanical Systems	• Ability to understand the operation of micro devices, micro systems and their applications. • Ability to design the micro devices, micro

				systems using the MEMS fabrication process.
33	FOUR / VII	MT6711	Computer Aided Design and Computer Aided Manufacturing Laboratory	• The students can able to apply the students can able to apply mathematical knowledge in modeling and assembly of parts
34	FOUR / VII	MT6712	Robotics Laboratory	• Use of Adam's software and MAT Lab software to model the different types of robots and calculate work volume for different robots.
35	FOUR / VII	MT6713	Design and Fabrication Project	• Use of design principles and develop conceptual and engineering design of any components. • Ability to fabricate any components using different manufacturing tools
36	FOUR / VIII	MT6801	Automotive Electronics	• The students will be able to use advanced sensors and actuators in the upgradation of automobiles.
37	FOUR / VIII	ELECTIVE(IV) MF6009	Rapid Prototyping	• To provide knowledge on different types of Rapid Prototyping systems and its applications in various fields
38	FOUR / VIII	MT6005	Virtual Instrumentation	• The students will be able to use virtual instruments to design various mechatronics systems
39	FOUR /	ME6015	Operations Research	• Upon completion of this course, the students can able to use the optimization techniques for use

				engineering and Business problems
	VIII			
40	FOUR / VIII	MG6071	Entrepreneurship Development	• Upon completion of the course, students will be able to gain knowledge and skills needed to run a business successfully.
41	FOUR / VIII	ELECTIVE(V) GE6075	Professional Ethics in Engineering	• Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society
42	FOUR / VIII	MG6088	Software Project Management	• At the end of the course the students will be able to practice Project Management principles while developing a software.
43	FOUR / VIII	CS6302	Database Management Systems	• Design Databases for applications. • Use the Relational model, ER diagrams. • Apply concurrency control and recovery mechanisms for practical problems. • Design the Query Processor and Transaction Processor. • Apply security concepts to databases.
44	FOUR / VIII	CS6551	Computer Networks	• Identify the components required to build different types of networks

				• Choose the required functionality at each layer for given application
				• Identify solution for each functionality at each layer
				• Trace the flow of information from one node to another node in the network

H.O.D

Principal

Department of Computer Science and Engineering
Program Outcomes

(Regulation – 2017)

PROGRAM OUTCOMES POs:

Engineering Graduates will be able to:

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

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

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

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

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

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

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

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

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

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

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.12.Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcomes Subject Wise

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
1.	I/ I	HS8151	COMMUNICATIVE ENGLISH	AT THE END OF THE COURSE, LEARNERS WILL BE ABLE TO: • Read articles of a general kind in magazines and newspapers. • Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English. • Comprehend conversations and short talks delivered in English • Write short essays of a general kind and personal letters and emails in English.
2.		MA8151	ENGINEERING MATHEMATICS – I	After completing this course, students should demonstrate competency in the following skills: ☐ Use both the limit definition and rules of differentiation to differentiate functions. ☐ Apply differentiation to solve maxima and minima problems. ☐ Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus. ☐ Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables. ☐ Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts. ☐ Determine convergence/divergence of improper integrals and evaluate convergent improper integrals. ☐ Apply various techniques in solving differential equations.
3.		PH8151	ENGINEERING PHYSICS	Upon completion of this course, ☐ The students will gain knowledge on the basics of properties of matter and its applications, ☐ The students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics, ☐ The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers, ☐ The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes, and ☐ The students will understand the basics of crystals, their structures and different crystal growth techniques.

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
4.	I/ I	CY8151	ENGINEERING CHEMISTRY	☐ 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.
5.		GE8151	PROBLEM SOLVING AND PYTHON PROGRAMMING	Upon completion of the course, students will be able to ☐ Develop algorithmic solutions to simple computational problems ☐ Read, write, execute by hand simple Python programs. ☐ Structure simple Python programs for solving problems. ☐ Decompose a Python program into functions. ☐ Represent compound data using Python lists, tuples, dictionaries. ☐ Read and write data from/to files in Python Programs.
6.		GE8152	ENGINEERING GRAPHICS	On successful completion of this course, the student will be able to: ☐ Familiarize with the fundamentals and standards of Engineering graphics ☐ Perform freehand sketching of basic geometrical constructions and multiple views of objects. ☐ Project orthographic projections of lines and plane surfaces. ☐ Draw projections and solids and development of surfaces. ☐ Visualize and to project isometric and perspective sections of simple solids
7.		GE8161	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	Upon completion of the course, students will be able to: ☐ Write, test, and debug simple Python programs. ☐ Implement Python programs with conditionals and loops. ☐ Develop Python programs step-wise by defining functions and calling them. ☐ Use Python lists, tuples, dictionaries for representing compound data. ☐ Read and write data from/to files in Python.
8.		BS8161	PHYSICS AND CHEMISTRY LABORATORY	Upon completion of the course, the students will be able to ☐ Apply principles of elasticity, optics and thermal properties for engineering applications ☐ The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
9.	I/ II	HS8251	TECHNICAL ENGLISH	At the end of the course learners will be able to: ? Read technical texts and write area- specific texts effortlessly. ? Listen and comprehend lectures and talks in their area of specialisation successfully. ? Speak appropriately and effectively in varied formal and informal contexts. ? Write reports and winning job applications.
10.		MA8251	ENGINEERING MATHEMATICS – II	After successfully completing the course, the student will have a good understanding of the following topics and their applications: ? Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices. ? Gradient, divergence and curl of a vector point function and related identities. ? Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification. ? Analytic functions, conformal mapping and complex integration. ? Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
11.		PH8252	PHYSICS FOR INFORMATION SCIENCE	At the end of the course, the students will able to ? Gain knowledge on classical and quantum electron theories, and energy band structuues, ? Acquire knowledge on basics of semiconductor physics and its applications in various devices, ? Get knowledge on magnetic properties of materials and their applications in data storage, ? Have the necessary understanding on the functioning of optical materials for optoelectronics, ? Understand the basics of quantum structures and their applications in carbon electronics.
12.		BE8255	BASIC ELECTRICAL, ELECTRONICS AND MEASUREMENT ENGINEERING	Upon completion of the course, the students will be able to: ? Discuss the essentials of electric circuits and analysis. ? Discuss the basic operation of electric machines and transformers ? Introduction of renewable sources and common domestic loads. ? Introduction to measurement and metering for electric circuits.

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
13.	I/ II	GE8291	ENVIRONMENTAL SCIENCE AND ENGINEERING	? 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. ? Public awareness of environmental is at infant stage. ? Ignorance and incomplete knowledge has lead to misconceptions ? Development and improvement in std. of living has lead to serious environmental disasters
14.		CS8251	PROGRAMMING IN C	Upon completion of the course, the students will be able to ? Develop simple applications in C using basic constructs ? Design and implement applications using arrays and strings ? Develop and implement applications in C using functions and pointers. ? Develop applications in C using structures. ? Design applications using sequential and random access file processing.
15.		GE8261	ENGINEERING PRACTICES LABORATORY	On successful completion of this course, the student will be able to Fabricate carpentry components and pipe connections including plumbing works. Use welding equipments to join the structures. Carry out the basic machining operations Make the models using sheet metal works Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings Carry out basic home electrical works and appliances Measure the electrical quantities Elaborate on the components, gates, soldering practices.
16.		CS8261	C PROGRAMMING LABORATORY	Upon completion of the course, the students will be able to: ? Develop C programs for simple applications making use of basic constructs, arrays and strings. ? Develop C programs involving functions, recursion, pointers, and structures. ? Design applications using sequential and random access file processing.

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
17.	II/ III	MA8351	DISCRETE MATHEMATICS	At the end of the course, students would: ? Have knowledge of the concepts needed to test the logic of a program. ? Have an understanding in identifying structures on many levels. ? 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. ? Be aware of the counting principles. ? Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.
18.		CS8351	DIGITAL PRINCIPLES AND SYSTEM DESIGN	On Completion of the course, the students should be able to: ? Simplify Boolean functions using KMap ? Design and Analyze Combinational and Sequential Circuits ? Implement designs using Programmable Logic Devices ? Write HDL code for combinational and Sequential Circuits
19.		CS8391	DATA STRUCTURES	At the end of the course, the student should be able to: ? Implement abstract data types for linear data structures. ? Apply the different linear and non-linear data structures to problem solutions. ? Critically analyze the various sorting algorithms
20.		CS8392	OBJECT ORIENTED PROGRAMMING	Upon completion of the course, students will be able to: ? Develop Java programs using OOP principles ? Develop Java programs with the concepts inheritance and interfaces ? Build Java applications using exceptions and I/O streams ? Develop Java applications with threads and generics classes ? Develop interactive Java programs using swings
21.		EC8395	COMMUNICATION ENGINEERING	At the end of the course, the student should be able to: ? Ability to comprehend and appreciate the significance and role of this course in the present contemporary world ? Apply analog and digital communication techniques. ? Use data and pulse communication techniques. ? Analyze Source and Error control coding.

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
22.	II/ III	CS8381	DATA STRUCTURES LABORATORY	At the end of the course, the students will be able to: ? Write functions to implement linear and non-linear data structure operations ? Suggest appropriate linear / non-linear data structure operations for solving a given problem ? Appropriately use the linear / non-linear data structure operations for a given problem ? Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval
23.		CS8383	OBJECT ORIENTED PROGRAMMING LABORATORY	Upon completion of the course, the students will be able to ? Develop and implement Java programs for simple applications that make use of classes, packages and interfaces. ? Develop and implement Java programs with arraylist, exception handling and multithreading . ? Design applications using file processing, generic programming and event handling.
24.		CS8382	DIGITAL SYSTEMS LABORATORY	Upon Completion of the course, the students will be able to: ? Implement simplified combinational circuits using basic logic gates ? Implement combinational circuits using MSI devices ? Implement sequential circuits like registers and counters ? Simulate combinational and sequential circuits using HDL
25.		HS8381	INTERPERSONAL SKILLS/LISTENING&SPEAKING	At the end of the course Learners will be able to: ? Listen and respond appropriately. ? Participate in group discussions ? Make effective presentations ? Participate confidently and appropriately in conversations both formal and informal
26.	II/ IV	MA8402	PROBABILITY AND QUEUING THEORY	Upon successful completion of the course, students should be able to:? Understand the fundamental knowledge of the concepts of probability and have knowledgeof standard distributions which can describe real life phenomenon.? Understand the basic concepts of one and two dimensional random variables and apply in engineering applications. ? Apply the concept of random processes in engineering disciplines.? Acquire skills in analyzing queueing models.? Understand and characterize phenomenon which evolve with respect to time in a probabilistic manner.

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
27.	II/ IV	CS8491	COMPUTER ARCHITECTURE	On Completion of the course, the students should be able to: ? Understand the basics structure of computers, operations and instructions. ? Design arithmetic and logic unit. ? Understand pipelined execution and design control unit. ? Understand parallel processing architectures. ? Understand the various memory systems and I/O communication.
28.		CS8492	DATABASE MANAGEMENT SYSTEMS	Upon completion of the course, the students will be able to: ? Classify the modern and futuristic database applications based on size and complexity ? Map ER model to Relational model to perform database design effectively ? Write queries using normalization criteria and optimize queries ? Compare and contrast various indexing strategies in different database systems ? Appraise how advanced databases differ from traditional databases.
29.		CS8451	DESIGN AND ANALYSIS OF ALGORITHMS	At the end of the course, the students should be able to: ? Design algorithms for various computing problems. ? Analyze the time and space complexity of algorithms. ? Critically analyze the different algorithm design techniques for a given problem. ? Modify existing algorithms to improve efficiency
30.		CS8493	OPERATING SYSTEMS	At the end of the course, the students should be able to: ? Analyze various scheduling algorithms. ? Understand deadlock, prevention and avoidance algorithms. ? Compare and contrast various memory management schemes. ? Understand the functionality of file systems. ? Perform administrative tasks on Linux Servers. ? Compare iOS and Android Operating Systems
31.		CS8494	SOFTWARE ENGINEERING	On Completion of the course, the students should be able to: ? Identify the key activities in managing a software project. ? Compare different process models. ? Concepts of requirements engineering and Analysis Modeling. ? Apply systematic procedure for software design and deployment. ? Compare and contrast the various testing and maintenance. ? Manage project schedule, estimate project cost and effort required.

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
32.	II/ IV	CS8481	DATABASE MANAGEMENT SYSTEMS LABORATORY	Upon completion of the course, the students will be able to: ? Use typical data definitions and manipulation commands. ? Design applications to test Nested and Join Queries ? Implement simple applications that use Views ? Implement applications that require a Front-end Tool ? Critically analyze the use of Tables, Views, Functions and Procedures
33.		CS8461	OPERATING SYSTEMS LABORATORY	At the end of the course, the student should be able to ? Compare the performance of various CPU Scheduling Algorithms ? Implement Deadlock avoidance and Detection Algorithms ? Implement Semaphores ? Create processes and implement IPC ? Analyze the performance of the various Page Replacement Algorithms ? Implement File Organization and File Allocation Strategies
34.		HS8461	ADVANCED READING AND WRITING	At the end of the course Learners will be able to: ? Write different types of essays. ? Write winning job applications. ? Read and evaluate texts critically. ? Display critical thinking in various professional contexts.

Department of Computer Science and Engineering
Program Outcomes

(Regulation – 2013)

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
1.	III/ V	MA6566	DISCRETE MATHEMATICS	At the end of the course, students would: □ Have knowledge of the concepts needed to test the logic of a program. □ Have an understanding in identifying structures on many levels. □ 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. □ Be aware of the counting principles. □ Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
2.	III/ V	CS6501	INTERNET PROGRAMMING	At the end of the course, the student should be able to: ☐ Implement Java programs. ☐ Create a basic website using HTML and Cascading Style Sheets. ☐ Design and implement dynamic web page with validation using JavaScript objects and by applying different event handling mechanisms. ☐ Design rich client presentation using AJAX. ☐ Design and implement simple web page in PHP, and to present data in XML format. ☐ Design and implement server side programs using Servlets and JSP.
3.		CS6502	OBJECT ORIENTED ANALYSIS AND DESIGN	At the end of the course, the student should be able to: ☐ Design and implement projects using OO concepts. ☐ Use the UML analysis and design diagrams. ☐ Apply appropriate design patterns. ☐ Create code from design. ☐ Compare and contrast various testing techniques.
4.		CS6503	THEORY OF COMPUTATION	At the end of the course, the student should be able to: ☐ Design Finite State Machine, Pushdown Automata, and Turing Machine. ☐ Explain the Decidability or Undecidability of various problems
5.		CS6504	COMPUTER GRAPHICS	At the end of the course, the student should be able to: ☐ Design two dimensional graphics. ☐ Apply two dimensional transformations. ☐ Design three dimensional graphics. ☐ Apply three dimensional transformations. ☐ Apply Illumination and color models. ☐ Apply clipping techniques to graphics. ☐ Design animation sequences.
6.		CS6511	CASE TOOLS LABORATORY	At the end of the course, the student should be able to ☐ Design and implement projects using OO concepts. ☐ Use the UML analysis and design diagrams. ☐ Apply appropriate design patterns. ☐ Create code from design. ☐ Compare and contrast various testing techniques

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
7.	III/ V	CS6512	INTERNET PROGRAMMING LABORATORY	At the end of the course, the student should be able to ☐ Design Web pages using HTML/XML and style sheets ☐ Create user interfaces using Java frames and applets. ☐ Create dynamic web pages using server side scripting. ☐ Write Client Server applications. ☐ Use the frameworks JSP Strut, Hibernate, Spring ☐ Create applications with AJAX
8.		CS6513	COMPUTER GRAPHICS LABORATORY	At the end of the course, the student should be able to ☐ Create 3D graphical scenes using open graphics library suits ☐ Implement image manipulation and enhancement ☐ Create 2D animations using tools.
9.	III/ VI	IT6601	MOBILE COMPUTING	At the end of the course, the student should be able to: ☐ Explain the basics of mobile telecommunication system ☐ Choose the required functionality at each layer for given application ☐ Identify solution for each functionality at each layer ☐ Use simulator tools and design Ad hoc networks ☐ Develop a mobile application.
10.		CS6660	COMPILER DESIGN	At the end of the course, the student should be able to: ☐ Design and implement a prototype compiler. ☐ Apply the various optimization techniques. ☐ Use the different compiler construction tools.
11.		IT6502	DIGITAL SIGNAL PROCESSING	Upon completion of the course, students will be able to: ☐ Perform frequency transforms for the signals. ☐ Design IIR and FIR filters. ☐ Finite word length effects in digital filters
12.		CS6659	ARTIFICIAL INTELLIGENCE	At the end of the course, the student should be able to: ☐ Identify problems that are amenable to solution by AI methods. ☐ Identify appropriate AI methods to solve a given problem. ☐ Formalise a given problem in the language/framework of different AI methods. ☐ Implement basic AI algorithms. ☐ Design and carry out an empirical evaluation of different algorithms on formalisation, and state the conclusions that the evaluation supports.

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
13.	III/ VI	CS6611	MOBILE APPLICATION DEVELOPMENT LABORATORY	At the end of the course, the student should be able to: ☐ Design and Implement various mobile applications using emulators. ☐ Deploy applications to hand-held devices
14.		CS6612	COMPILER LABORATORY	At the end of the course, the student should be able to ☐ Implement the different Phases of compiler using tools ☐ Analyze the control flow and data flow of a typical program ☐ Optimize a given program Generate an assembly language program equivalent to a source language program
15.		GE6674	COMMUNICATION AND SOFT SKILLS - LABORATORY BASED	At the end of the course, learners should be able to ☐ Take international examination such as IELTS and TOEFL ☐ Make presentations and Participate in Group Discussions. ☐ Successfully answer questions in interviews.
16.	IV/ VII	CS6701	CRYPTOGRAPHY AND NETWORK SECURITY	Upon Completion of the course, the students should be able to: ☐ Compare various Cryptographic Techniques ☐ Design Secure applications ☐ Inject secure coding in the developed applications.
17.		CS6702	GRAPH THEORY AND APPLICATIONS	Upon Completion of the course, the students should be able to: ☐ Write precise and accurate mathematical definitions of objects in graph theory. ☐ Use mathematical definitions to identify and construct examples and to distinguish examples from non-examples. ☐ Validate and critically assess a mathematical proof. ☐ Use a combination of theoretical knowledge and independent mathematical thinking in creative investigation of questions in graph theory. Reason from definitions to construct mathematical proofs.
18.		CS6703	GRID AND CLOUD COMPUTING	At the end of the course, the student should be able to:☐ Apply grid computing techniques to solve large scale scientific problems. ☐ Apply the concept of virtualization. ☐ Use the grid and cloud tool kits. ☐ Apply the security models in the grid and the cloud environment.
19.		CS6704	RESOURCE MANAGEMENT TECHNIQUES	Upon Completion of the course, the students should be able to: ☐ Solve optimization problems using simplex method.☐ Apply integer programming and linear programming to solve real-life applications.☐ Use PERT and CPM for problems in project management

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
20.	IV/ VII	CS6711	SECURITY LABORATORY	At the end of the course, the student should be able to ☐ Implement the cipher techniques ☐ Develop the various security algorithms ☐ Use different open source tools for network security and analysis
21.		CS6712	GRID AND CLOUD COMPUTING LABORATORY	At the end of the course, the student should be able to ☐ Use the grid and cloud tool kits. ☐ Design and implement applications on the Grid. ☐ Design and Implement applications on the Cloud.
22.	IV/ VIII	CS6801	MULTI-CORE ARCHITECTURES AND PROGRAMMING	At the end of the course, the student should be able to: ☐ Program Parallel Processors. ☐ Develop programs using OpenMP and MPI. ☐ Compare and contrast programming for serial processors and programming for parallel processors.
23.		CS6811	PROJECT WORK	On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

ELECTIVE SUBJECTS

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
1.	ELECTIVES	CS6001	C# AND .NET PROGRAMMING	After completing this course, the student will be able to: ☐ List the major elements of the .NET frame work ☐ Explain how C# fits into the .NET platform. ☐ Analyze the basic structure of a C# application ☐ Debug, compile, and run a simple application. ☐ Develop programs using C# on .NET ☐ Design and develop Web based applications on .NET ☐ Discuss CLR.
2.		GE6757	TOTAL QUALITY MANAGEMENT	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.
3.		IT6702	DATA WAREHOUSING AND DATA MINING	After completing this course, the student will be able to: ☐ Apply data mining techniques and methods to large data sets. ☐ Use data mining tools ☐ Compare and contrast the various classifiers

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
4.	ELECTIVES	CS6002	NETWORK ANALYSIS AND MANAGEMENT	At the end of this course the students should be able to: ☐ Explain the key concepts and algorithms in complex network analysis. ☐ Apply a range of techniques for characterizing network structure. ☐ Discuss methodologies for analyzing networks of different fields. ☐ Demonstrate knowledge of recent research in the area and exhibit technical writing and presentation skills.
5.		IT6004	SOFTWARE TESTING	At the end of the course the students will be able to ☐ Design test cases suitable for a software development for different domains. ☐ Identify suitable tests to be carried out. ☐ Prepare test planning based on the document. ☐ Document test plans and test cases designed. ☐ Use of automatic testing tools. ☐ Develop and validate a test plan.
6.		CS6003	AD HOC AND SENSOR NETWORKS	Upon completion of the course, the student should be able to: ☐ Explain the concepts, network architectures and applications of ad hoc and wireless sensor networks ☐ Analyze the protocol design issues of ad hoc and sensor networks ☐ Design routing protocols for ad hoc and wireless sensor networks with respect to some protocol design issues ☐ Evaluate the QoS related performance measurements of ad hoc and sensor networks
7.		CS6004	CYBER FORENSICS	Upon completion of the course, the student should be able to: ☐ Discuss the security issues network layer and transport layer ☐ Apply security principles in the application layer ☐ Explain computer forensics ☐ Use forensics tools ☐ Analyze and validate forensics data
8.		CS6005	ADVANCED DATABASE SYSTEMS	Upon completion of the course, the student should be able to: ☐ Design different types of databases. ☐ Use query languages. ☐ Apply indexing techniques.
9.		BM6005	BIO INFORMATICS	Upon Completion of the course, the students will be able to ☐ Develop models for biological data. ☐ Apply pattern matching techniques to bioinformatics data – protein data genomic data. ☐ Apply micro array technology for genomic expression study.

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
10.	ELECTIVES	IT6801	SERVICE ORIENTED ARCHITECTURE	Upon successful completion of this course, students will be able to: ☐ Build applications based on XML. ☐ Develop web services using technology elements. ☐ Build SOA-based applications for intra-enterprise and inter-enterprise applications.
11.		IT6005	DIGITAL IMAGE PROCESSING	Upon successful completion of this course, students will be able to: ☐ Discuss digital image fundamentals. ☐ Apply image enhancement and restoration techniques. ☐ Use image compression and segmentation Techniques. ☐ Represent features of images.
12.		EC6703	EMBEDDED AND REAL TIME SYSTEMS	Upon completion of the course, students will be able to: ☐ Describe the architecture and programming of ARM processor. ☐ Outline the concepts of embedded systems ☐ Explain the basic concepts of real time Operating system design. ☐ Use the system design techniques to develop software for embedded systems ☐ Differentiate between the general purpose operating system and the real time operating system ☐ Model real-time applications using embedded-system concepts
13.		CS6006	GAME PROGRAMMING	Upon completion of the course, students will be able to ☐ Discuss the concepts of Game design and development. ☐ Design the processes, and use mechanics for game development. ☐ Explain the Core architectures of Game Programming. ☐ Use Game programming platforms, frame works and engines. ☐ Create interactive Games.
14.		CS6007	INFORMATION RETRIEVAL	Upon completion of the course, students will be able to ☐ Apply information retrieval models. ☐ Design Web Search Engine. ☐ Use Link Analysis. ☐ Use Hadoop and Map Reduce. ☐ Apply document text mining techniques.

S.No.	Year/ Sem	Sub. Code	Sub. Title	Course Outcomes
15.		IT6006	DATA ANALYTICS	The student should be made to: * Apply the statistical analysis methods. * Compare and contrast various soft computing frameworks. * Design distributed file systems. * Apply Stream data model.* Use Visualisation techniques
16.		CS6008	HUMAN COMPUTER INTERACTION	Upon completion of the course, the student should be able to:* Design effective dialog for HCI. * Design effective HCI for individuals and persons with disabilities.* Assess the importance of user feedback.* Explain the HCI implications for designing multimedia/ ecommerce/ e-learning Web sites.* Develop meaningful user interface.
17.		CS6009	NANO COMPUTING	Upon completion of the course, the student should be able to:* Discuss nano computing challenges. * Handle the imperfections.* Apply reliability evaluation strategies.* Use nano scale quantum computing.* Utilize Molecular Computing and Optimal Computing.
18.		IT6011	KNOWLEDGE MANAGEMENT	Upon completion of the course, the student should be able to:* Use the knowledge management tools. * Develop knowledge management Applications. * Design and develop enterprise applications.
19.	ELECTIVES	CS6010	SOCIAL NETWORK ANALYSIS	Upon completion of the course, the student should be able to:* Develop semantic web related applications.* Represent knowledge using ontology.* Predict human behaviour in social web and related communities.* Visualize social networks.
20.		MG6088	SOFTWARE PROJECT MANAGEMENT	At the end of the course the students will be able to practice Project Management principles while developing a software.
21.		GE6075	PROFESSIONAL ETHICS IN ENGINEERING	Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society
22.		CS6011	NATURAL LANGUAGE PROCESSING	Upon completion of the course, the student should be able to:* Analyze the natural language text. * Generate the natural language. * Do machine translation. * Apply information retrieval techniques.
23.		CS6012	SOFT COMPUTING	Upon completion of the course, the student should be able to: * Apply various soft computing frame works. * Design of various neural networks. * Use fuzzy logic. * Apply genetic programming. * Discuss hybrid soft computing.

21/06/19.

Signature of Head of the Department　　　　　　　**Signature of Principal**

M.A.M. SCHOOL OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

Program outcomes, program specific outcomes and course outcomes

Regulation - 2013

S.No.	YEAR	SUB. Code	SUB. Title	OUTCOMES
1	III	ME6501	COMPUTER AIDED DESIGN	Upon completion of this course, the students can able to use computer and CAD software's for modeling of mechanical components
2	III	ME6502	HEAT AND MASS TRANSFER	Upon completion of this course, the students can able to understand and apply different heat and mass transfer principles of different applications.
3	III	ME6503	DESIGN OF MACHINE ELEMENTS	Upon completion of this course, the students can able to successfully design machine components
4	III	ME6504	METROLOGY AND MEASUREMENTS	Upon completion of this course, the Students can demonstrate different measurement technologies and use of them in Industrial Components
5	III	ME6505	DYNAMICS OF MACHINES	Upon completion of this course, the Students can able to

				predict the force analysis in mechanical system and related vibration issues and can able to solve the problem
6	III	GE6075	PROFESSIONAL ETHICS IN ENGINEERING	Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society
7	III	ME6511	DYNAMICS LABORATORY	Ability to demonstrate the principles of kinematics and dynamics of machinery Ability to use the measuring devices for dynamic testing.
8	III	ME6512	THERMAL ENGINEERING LABORATORY – II	Ability to demonstrate the fundamentals of heat and predict the coefficient used in that transfer application and also design refrigeration cycle.
9	III	ME6513	METROLOGY AND MEASUREMENTS LABORATORY	Ability to handle different measurement tools and perform measurements in quality impulsion
10	III	ME6601	DESIGN OF TRANSMISSION SYSTEMS	Upon completion of this course, the students can able to successfully design transmission components used in

				Engine and machines
11	III	MG6851	PRINCIPLES OF MANAGEMENT	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management
12	III	ME6602	AUTOMOBILE ENGINEERING	Upon completion of this course, the students will be able to identify the different components in automobile engineering. Have clear understanding on different auxiliary and transmission systems usual
13	III	ME6603	FINITE ELEMENT ANALYSIS	Upon completion of this course, the students can able to understand different mathematical Techniques used in FEM analysis and use of them in Structural and thermal problem
14	III	ME6604	GAS DYNAMICS AND JET PROPULSION	Upon completion of this course, the students can able to successfully apply gas dynamics principles in the Jet and Space Propulsion

15		ME6004	UNCONVENTIONAL MACHINING PROCESSES	Upon completion of this course, the students can able to demonstrate different unconventional machining processes and know the influence of difference process parameters on the performance and their applications
16	III	ME6611	C.A.D. / C.A.M. LABORATORY	Ability to develop 2D and 3D models using modeling softwares. Ability to understand the CNC control in modern manufacturing system. Ability to prepare CNC part programming and perform manufacturing
17	III	ME6612	DESIGN & FABRICATION PROJECT	Use of design principles and develop conceptual and engineering design of any components. Ability to fabricate any components using different manufacturing tools.
18	III	GE6563	COMMUNICATION SKILLS - LABORATORY BASED	At the end of the course, learners should be able to Take international examination such as IELTS and TOEFL Make presentations and Participate in Group Discussions. Successfully answer questions in interviews.
19	IV	ME6701	POWER PLANT ENGINEERING	Upon completion of this course, the students can able to understand different types of power plant, and its functions and their flow lines and

				issues related to them. Analyse and solve energy and economic related issues in power sectors.
20	IV	ME6702	MECHATRONICS	Upon completion of this course, the students can able to design Mechatronics system with the help of Microprocessor, PLC and other electrical and Electronics Circuits.
21	IV	ME6703	COMPUTER INTEGRATED MANUFACTURING SYSTEMS	Upon completion of this course, the student can able to understand the use of computers in process planning and use of FMS and Robotics in CIM
22	IV	GE6757	TOTAL QUALITY MANAGEMENT	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.
23	IV	ME6008	WELDING TECHNOLOGY	Upon completion of this course, the students can able to compare different types of Welding process for effective Welding of Structural components.
24	IV	ME6711	SIMULATION AND ANALYSIS LABORATORY	Upon completion of this course, the Students can model, analyse and simulate experiments to meet real world system and

				evaluate the performance.
25	IV	ME6712	MECHATRONICS LABORATORY	Upon completion of this course, the students can able to design Mechatronics system with the help of Microprocessor, PLC and other electrical and Electronics Circuits.
26	IV	ME6713	COMPREHENSION	Ability to understand and comprehend any given problem related to mechanical engineering field
27	IV	MG6863	ENGINEERING ECONOMICS	Upon successful completion of this course, students will acquire the skills to apply the basics of economics and cost analysis to engineering and take economically sound decisions
28	IV	MG6071	ENTREPRENEURSHIP DEVELOPMENT	Upon completion of the course, students will be able to gain knowledge and skills needed to run a business successfully.
29	IV	ME6018	ADDITIVE MANUFACTURING	Upon completion of this course, the students can able to compare different method and discuss the effects of the Additive Manufacturing technologies and analyse the

				characteristics of the different materials in Additive Manufacturing.
30	IV	ME6811	PROJECT WORK	On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology

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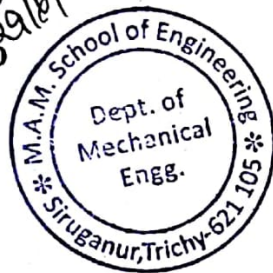
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M.A.M. SCHOOL OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

Program outcomes, program specific outcomes and course outcomes

Regulation - 2017

S.No	YEAR	SUB. Code	SUB. Title	OUTCOMES
1	I	HS8151	COMMUNICATIVE ENGLISH	At the end of the course, learners will be able to: • Read articles of a general kind in magazines and newspapers. • Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English. • Comprehend conversations and short talks delivered in English • Write short essays of a general kind and personal letters and emails in English.
2	I	PH8151	ENGINEERING PHYSICS	Upon completion of this course, • the students will gain knowledge on the basics of properties of matter and its applications, • the students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics, • the students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers,the students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes, and • the students will understand the basics of crystals, their structures and different crystal growth techniques. •
3	I	CY8151	ENGINEERING CHEMISTRY	• 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.
4	I	GE8151	PROBLEM SOLVING AND PYTHON PROGRAMMING		**Upon completion of the course, students will be able to** • Develop algorithmic solutions to simple computational problems • Read, write, execute by hand simple Python programs. • Structure simple Python programs for solving problems. • Decompose a Python program into functions. • Represent compound data using Python lists, tuples, dictionaries. • Read and write data from/to files in Python Programs.
5	I	GE8152	ENGINEERING GRAPHICS		On successful completion of this course, the student will be able to • familiarize with the fundamentals and standards of Engineering graphics • Perform freehand sketching of basic geometrical constructions and multiple views of objects. • project orthographic projections of lines and plane surfaces. • draw projections and solids and development of surfaces. • Visualize and to project isometric and perspective sections of simple solids.
6	I	GE8161	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY		**Upon completion of the course, students will be able to** • Write, test, and debug simple Python programs. • Implement Python programs with conditionals and loops. • Develop Python programs step-wise by defining functions and calling them. • Use Python lists, tuples, dictionaries for representing compound data. • Read and write data from/to files in Python.
7	I	BS8161	PHYSICS AND CHEMISTRY LABORATORY		Upon completion of the course, the students will be able to • apply principles of elasticity, optics and thermal properties for

				engineering applications.
				• The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.
8	I	HS8251	TECHNICAL ENGLISH	At the end of the course learners will be able to: Read technical texts and write area-specific texts effortlessly. Listen and comprehend lectures and talks in their area of specialisation successfully. Speak appropriately and effectively in varied formal and informal contexts. Write reports and winning job applications.
9	I	MA8251	ENGINEERING MATHEMATICS - II	After successfully completing the course, the student will have a good understanding of the following topics and their applications: Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices. Gradient, divergence and curl of a vector point function and related identities. Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification. Analytic functions, conformal mapping and complex integration. Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
10	I	PH8251	MATERIALS SCIENCE	Upon completion of this course, • the students will have knowledge on the various phase diagrams and their applications

				• the students will acquire knowledge on Fe-Fe_3C phase diagram, various microstructures and alloys • the students will get knowledge on mechanical properties of materials and their measurement • the students will gain knowledge on magnetic, dielectric and superconducting properties of materials the students will understand the basics of eramics, composites and nano materials.
11	I	BE8253	BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING	Ability to • Understand electric circuits and working principles of electrical machines • Understand the concepts of various electronic devices • Choose appropriate instruments for electrical measurement for a specific application
12	I	GE8291	ENVIRONMENTAL SCIENCE AND ENGINEERING	• 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. • Public awareness of environmental is at infant stage. • Ignorance and incomplete knowledge has lead to misconceptions • Development and improvement in std. of living has lead to serious environmental disasters
13	I	GE8292	ENGINEERING MECHANICS	On successful completion of this course, the student will be able to • illustrate the vectorial and scalar representation of forces and moments • analyse the rigid body in equilibrium • evaluate the properties of surfaces and solids • calculate dynamic forces exerted in rigid body • determine the friction and the effects by the laws of friction

|				
14	I	GE8261	ENGINEERING PRACTICES LABORATORY	On successful completion of this course, the student will be able to • fabricate carpentry components and pipe connections including plumbing works. • use welding equipments to join the structures. • Carry out the basic machining operations • Make the models using sheet metal works • Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings • Carry out basic home electrical works and appliances • Measure the electrical quantities • Elaborate on the components, gates, soldering practices.
15	I	BE8261	BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING LABORATORY	Ability to determine the speed characteristic of different electrical machines Ability to design simple circuits involving diodes and transistors Ability to use operational amplifiers
16	II	MA8353	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	Upon successful completion of the course, students should be able to: • Understand how to solve the given standard partial differential equations. • Solve differential equations using Fourier series analysis which plays a vital role in engineering applications. • Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations. • 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. • Use the effective mathematical tools for the solutions of partial differential equations by using Z

				transform techniques for discrete time systems.
17	II	ME8391	ENGINEERING THERMODYNAMICS	Upon completion of this course, the students will be able to • CO1Apply the first law of thermodynamics for simple open and closed systems under steady and unsteady conditions. • CO2 Apply second law of thermodynamics to open and closed systems and calculate entropy and availability. • CO3 Apply Rankine cycle to steam power plant and compare few cycle improvement methods • CO4 Derive simple thermodynamic relations of ideal and real gases • CO5 Calculate the properties of gas mixtures and moist air and its use in psychometric processes
18	II	CE8394	FLUID MECHANICS AND MACHINERY	Upon completion of this course, the students will be able to • Apply mathematical knowledge to predict the properties and characteristics of a fluid. • Can analyse and calculate major and minor losses associated with pipe flow in piping networks. • Can mathematically predict the nature of physical quantities • Can critically analyse the performance of pumps • Can critically analyse the performance of turbines.
19	II	ME8351	MANUFACTURING TECHNOLOGY - I	• CO1Explain different metal casting processes, associated defects, merits and demerits • CO2Compare different metal joining processes. • CO3Summarize various hot working and cold working methods of metals. • CO4Explain various sheet metal making processes. • CO5Distinguish various methods of manufacturing plastic components.
20	II	EE8353	ELECTRICAL DRIVES AND CONTROLS	• Upon Completion of this subject, the students can able to explain different types of electrical machines and their performance

21	II	ME8361	MANUFACTURING TECHNOLOGY LABORATORY - I	• CO1Demonstrate the safety precautions exercised in the mechanical workshop. • CO2Make the workpiece as per given shape and size using Lathe. • CO3Join two metals using arc welding. • CO4Use sheet metal fabrication tools and make simple tray and funnel. • CO5Use different moulding tools, patterns and prepare sand moulds.
22	II	ME8381	COMPUTER AIDED MACHINE DRAWING	• CO1Follow the drawing standards, Fits and Tolerances • CO2Re-create part drawings, sectional views and assembly drawings as per standards
23	II	EE8361	ELECTRICAL ENGINEERING LABORATORY	• Ability to perform speed characteristic of different electrical machine
24	II	HS8381	INTERPERSONAL SKILLS / LISTENING & SPEAKING	• Listen and respond appropriately. • Participate in group discussions • Make effective presentations • Participate confidently and appropriately in conversations both formal and informal
25	II	MA8452	STATISTICS AND NUMERICAL METHODS	Upon successful completion of the course, students will be able to: • Apply the concept of testing of hypothesis for small and large samples in real life problems. • Apply the basic concepts of classifications of design of experiments in the field of agriculture. • Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems. • Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations. • Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications

26	II	ME8492	KINEMATICS OF MACHINERY	• CO1 Discuss the basics of mechanism • CO2 Calculate velocity and acceleration in simple mechanisms • CO3 Develop CAM profiles • CO4 Solve problems on gears and gear trains • CO5 Examine friction in machine elements
27	II	ME8451	MANUFACTURING TECHNOLOGY – II	• CO1 Explain the mechanism of material removal processes. • CO2 Describe the constructional and operational features of centre lathe and other special purpose lathes. • CO3 Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines. • CO4 Explain the types of grinding and other super finishing processes apart from gear manufacturing processes. • CO5 Summarize numerical control of machine tools and write a part program.
28	II	ME8491	ENGINEERING METALLURGY	**Upon the completion of this course the students will be able to** • CO1 Explain alloys and phase diagram, Iron-Iron carbon diagram and steel classification. • CO2 Explain isothermal transformation, continuous cooling diagrams and different heat treatment processes. • CO3 Clarify the effect of alloying elements on ferrous and non-ferrous metals • CO4 Summarize the properties and applications of non metallic materials. • CO5 Explain the testing of mechanical properties.
29	II	CE8395	STRENGTH OF MATERIALS FOR MECHANICAL ENGINEERS	Students will be able to • Understand the concepts of stress and strain in simple and compound bars, the importance of principal stresses and principal planes. • Understand the load transferring mechanism in beams and stress distribution due to shearing force and bending moment. • Apply basic equation of simple torsion in designing of shafts and helical

				• spring • Calculate the slope and deflection in beams using different methods. • Analyze and design thin and thick shells for the applied internal and external pressures.
30	II	ME8493	THERMAL ENGINEERING- I	**Upon the completion of this course the students will be able to** • CO1Apply thermodynamic concepts to different air standard cycles and solve problems. • CO2Solve problems in single stage and multistage air compressors • CO3Explain the functioning and features of IC engines, components and auxiliaries. • CO4Calculate performance parameters of IC Engines. • CO5Explain the flow in Gas turbines and solve problems.
31	II	ME8462	MANUFACTURING TECHNOLOGY LABORATORY – II	**Upon the completion of this course the students will be able to** • CO1use different machine tools to manufacturing gears • CO2Ability to use different machine tools to manufacturing gears • CO3Ability to use different machine tools for finishing operations • CO4Ability to manufacture tools using cutter grinder • CO5Develop CNC part programming
32	II	HS8461	ADVANCED READING AND WRITING	**At the end of the course Learners will be able to:** • Write different types of essays. • Write winning job applications. • Read and evaluate texts critically. Display critical thinking in various professional contexts.

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Mechanical
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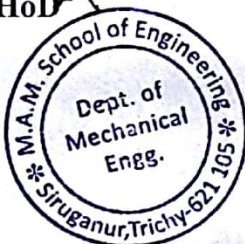
PRINCIPAL

PROGRAMME EDUCATIONAL OBJECTIVES

PEO1: To enable graduates to pursue research, or have a successful career in academia or industries associated with Electronics and Communication Engineering, or as entrepreneurs. PEO2: To provide students with strong foundational concepts and also advanced techniques and tools in order to enable them to build solutions or systems of varying complexity. PEO3: To prepare students to critically analyze existing literature in an area of specialization and ethically develop innovative and research oriented methodologies to solve the problems identified.
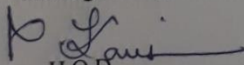
PROGRAMME OUTCOMES

Engineering Graduates will be able to:

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

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

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

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

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

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

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

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

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

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

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

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

PROGRAM SPECIFIC OBJECTIVES (PSOs)

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

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Program Outcomes

On completion of the 4 Year B.E (ECE) Degree, the Electronics and Communication graduates will be able to,

1. Apply the basic knowledge acquired from Mathematics, Science and Engineering in Electronics and Communication field.
2. Problem identification, formulating and solving complex problems to achieve the desired results using the empirical data and engineering knowledge.
3. Designing of circuits using active and passive components to enrich the quality of signals.
4. Apply the analog/digital communication knowledge acquired, to the media and provide solutions for information sharing to the society.
5. Provide solutions for the military communications and providing security through unmanned intelligent systems.
6. Obtain knowledge about public awareness of environment in the infant stage, understands that the development and improvement of standard of living has lead to serious environmental disasters
7. Have clear understanding of managerial functions like planning, organizing, staffing, leading and controlling and have some basic knowledge on international aspect of management
8. Apply the contextual knowledge to assess societal, health, safety and cultural issues and endure the consequent responsibilities relevant to the professional engineering practice.
9. Examine the impact of engineering solutions in global and environmental contexts and utilize the knowledge for sustained development.
10. Develop consciousness of professional, ethical and social responsibilities as experts in the field of Electronics and Communication Engineering.
11. Demonstrate knowledge and understanding of the engineering and management principles to manage projects in multidisciplinary environment.
12. Demonstrate resourcefulness for contemporary issues and lifelong learning.

27/6/16

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MAM SCHOOL OF ENGINEERING

Siruganur, Tiruchirappalli – 621 105.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES

ACADEMIC YEAR (2018 - 2019)

YEAR/SEM	SUBJECT CODE	SUBJECT TITLE	COURSE OUTCOME
II/III	MA8352	LINEAR ALGEBRA AND PARTIAL DIFFERENTIAL EQUATIONS	1.Explain the fundamental concepts of advanced algebra and their role in modern 38 mathematics and applied contexts. Demonstrate accurate and efficient use of advanced algebraic techniques. 2. Demonstrate their mastery by solving non - trivial problems related to the concepts and by proving simple theorems about the statements proven by the text. Able to solve various types of partial differential equations. 3.Able to solve engineering problems using Fourier series.
II/III	EC8393	FUNDAMENTALS OF DATA STRUCTURES IN C	1.Implement linear and non-linear data structure operations using C 2. Suggest appropriate linear / non-linear data structure for any given data set.• 3. Apply hashing concepts for a given problem• 4. Modify or suggest new data structure for an application 5. Appropriately choose the sorting algorithm for an application•
II/III	EC8351	ELECTRONIC CIRCUITS I	1.Acquire knowledge of Working principles, characteristics and applications of BJT and FET 2. Frequency response characteristics of BJT and FET amplifiers 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
II/III	EC8352	SIGNALS AND SYSTEMS	1.To be able to determine if a given system is linear/causal/stable 2. Capable of determining the frequency components present in a deterministic signal 3. Capable of characterizing LTI systems in the time domain and frequency domain 4.To be able to compute the output of an LTI system in the time and frequency domains
II/III	EC8392	DIGITAL ELECTRONICS	1.Use digital electronics in the present contemporary world Design various combinational digital circuits using logic gates 2. Do the analysis and design procedures for synchronous and asynchronous sequential circuits Use the semiconductor memories and related technology 3. Use electronic circuits involved in the design of logic gates
II/III	EC8391	CONTROL SYSTEMS ENGINEERING	1.Identify the various control system components and their representations. Analyze the various time domain parameters 2. Analysis the various frequency response plots and its system. 3.Apply the concepts of various system stability criterions. 4.Design various transfer functions of digital control system using state variable models.
II/III	EC8381	FUNDAMENTALS OF DATA STRUCTURES IN C LABORATORY	1.Write basic and advanced programs in C Implement functions and recursive functions in C 2.Implement data structures using C 3. Choose appropriate sorting algorithm for an

			Analyze transistorized amplifier and oscillator circuits
			2. Design and analyze feedback amplifiers
			3. Design LC and RC oscillators, tuned amplifiers, wave shaping circuits, multivibrators, power amplifier and DC convertors.
II/IV	EC8491	COMMUNICATION THEORY	1.Design AM communication systems Design Angle modulated communication systems
			2. Apply the concepts of Random Process to the design of Communication systems
			3. Analyze the noise performance of AM and FM systems
			4. Gain knowledge in sampling and quantization
II/IV	EC8451	ELECTROMAGNETIC FIELDS	1.Display an understanding of fundamental electromagnetic laws and concepts Write Maxwell's equations in integral, differential and phasor forms and explain their physical
			2. meaning Explain electromagnetic wave propagation in lossy and in lossless media
			3. Solve simple problems requiring estimation of electric and magnetic field quantities based on these concepts and laws
II/IV	EC8453	LINEAR INTEGRATED CIRCUITS	1.Design linear and non linear applications of OP – AMPS Design applications using analog multiplier and PLL
			2.Design ADC and DAC using OP – AMPS
			3. Generate waveforms using OP – AMP Circuits
			4. Analyze special function ICs
II/IV	GE8291	ENVIRONMENTAL SCIENCE AND ENGINEERING	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. Public awareness of

III/V	EC 6504	MICROPROCESSOR AND MICROCONTROLLER	1. Design and implement programs on 8086 microprocessor. 2. Design I/O circuits. 3. Design Memory Interfacing circuits. 4. ▢ Design and implement 8051 microcontroller based systems.
III/V	EC 6511	DIGITAL SIGNAL PROCESSING LABORATORY	1. Carry out simulation of DSP systems 2. Demonstrate their abilities towards DSP processor based implementation of DSP systems 3. Analyze Finite word length effect on DSP systems 4. Demonstrate the applications of FFT to DSP 5. Implement adaptive filters for various applications of DSP
III/V	EC 6512	COMMUNICATION SYSTEM LABORATORY	1. Simulate end-to-end Communication Link 2. Demonstrate their knowledge in base band signaling schemes through implementation of FSK, PSK and DPSK 3. Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system 4. Simulate & validate the various functional modules of a communication system
III/V	EC 6513	MICROPROCESSOR AND MICROCONTROLLER LABORATROY	1. Write ALP Programmes for fixed and Floating Point and Arithmetic 2. Interface different I/Os with processor 3. Generate waveforms using Microprocessors 4. Execute Programs in 8051 5. Explain the difference between simulator and Emulator
III/VI	MG6851	PRINCIPLES OF MANAGEMENT	1. Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management
III/VI	CS6303	COMPUTER ARCHITECTURE	1. Design arithmetic and logic unit. 2. Design and anlayse pipelined control units 3. Evaluate performance of memory systems. 4. Understand parallel processing architectures.
III/VI	CS 6551	COMPUTER NETWORKS	1. Identify the components required to build different types of networks

			environmental is at infant stage.
			2. Ignorance and incomplete knowledge has lead to misconceptions
			3.Development and improvement in std. of living has lead to serious environmental disasters
III/V	EC6501	DIGITAL COMMUNICATION	1. Design PCM systems 2. Design and implement base band transmission schemes 3. Design and implement band pass signaling schemes 4. Analyze the spectral characteristics of band pass signaling schemes and their noise performance 5. Design error control coding schemes
III/V	EC 6502	PRINICIPLES OF DIGITAL SIGNAL PROCESSING	1. apply DFT for the analysis of digital signals & systems 2. design IIR and FIR filters 3. characterize finite Word length effect on filters 4. design the Multirate Filters 5. apply Adaptive Filters to equalization
III/V	EC 6503	TRANSMISSION LINES AND WAVEGUIDES	1. Discuss the propagation of signals through transmission lines. 2. Analyze signal propagation at Radio frequencies. 3. Explain radio propagation in guided systems. 4. Utilize cavity resonators.
III/V	GE 6351	ENVIRONMENTAL SCIENCE AND ENGINEERING	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. 1. Public awareness of environment at infant stage. 2. Ignorance and incomplete knowledge has lead to misconceptions. 3. Development and improvement in standard of living has lead to serious environmental disasters.

			2. Choose the required functionality at each layer for given application
			3. Identify solution for each functionality at each layer
			4. Trace the flow of information from one node to another node in the network
III/VI	EC 6601	VLSI DESIGN	1. Explain the basic CMOS circuits and the CMOS process technology.
			2. Discuss the techniques of chip design using programmable devices.
			3. Model the digital system using Hardware Description Language.
III/VI	EC 6602	ANTENNA AND WAVE PROPAGATION	1. Explain the various types of antennas and wave propagation.
			2. Write about the radiation from a current element.
			3. Analyze the antenna arrays, aperture antennas and special antennas such as frequency independent and broad band
III/VI	EC6001	MEDICAL ELECTRONICS	1. Discuss the application of electronics in diagnostic and therapeutic area.
			2. Measure biochemical and various physiological information.
			3. Describe the working of units which will help to restore normal functioning.
III/VI	EC 6611	COMPUTER NETWORKS LABORATORY	1. Communicate between two desktop computers.
			2. Implement the different protocols
			3. Program using sockets. ⬛ Implement and compare the various routing algorithms
			4. Use simulation tool.
III/VI	EC 6612	VLSI DESIGN LABORATORY	1. Write HDL code for basic as well as advanced digital integrated circuits.
			2. Import the logic modules into FPGA Boards.
			3. Synthesize, Place and Route the digital IPs.
			4. Design, Simulate and Extract the layouts of Analog IC Blocks using EDA tools.
III/VI	GE6674	COMMUNICAITON AND SOFTSKILLS LABORATORY-BASED	1. Take international examination such as IELTS and TOEFL
			2. Make presentations and Participate in Group Discussions.
			3. Successfully answer questions in interviews.
IV/VII	EC6701	RF AND MICROWAVE ENGINEERING	1. Explain the active & passive microwave devices & components used in Microwave communication systems.
			2. Analyze the multi- port RF networks and RF

			transistor amplifiers.
			3. Generate Microwave signals and design microwave amplifiers.
			4. Measure and analyze Microwave signal and parameters.
IV/VII	EC 6702	OPTICAL COMMUNICATION AND NETWORKS	1. Discuss the various optical fiber modes, configurations and various signal degradation factors associated with optical fiber. 2. Explain the various optical sources and optical detectors and their use in the optical communication system. 3. Analyze the digital transmission and its associated parameters on system performance.
IV/VII	EC 6703	EMBEDDED AND REAL TIME SYSTEMS	1. Describe the architecture and programming of ARM processor. 2. Outline the concepts of embedded systems 3. Explain the basic concepts of real time Operating system design. 4. Use the system design techniques to develop software for embedded systems 5. Differentiate between the general purpose operating system and the real time operating system 6. Model real-time applications using embedded-system concepts
IV/VII	EC6004	SATELLITE COMMUNICATION	1. Analyze the satellite orbits. 2. Analyze the earth segment and space segment. 3. Design various satellite applications
IV/VII	EC6011	ELECTROMAGNETIC INTERFERENCE AND COMPATIBILITY	1. Find solution to EMI Sources, EMI problems in PCB level / Subsystem and system level design. 2. To measure emission immunity level from different systems to couple with the prescribed EMC standards
IV/VII	EC6016	OPTO ELECTRONIC DEVICES	1. To design display devices. 2. To design optoelectronic detection devices and modulators. 3. To design optoelectronic integrated circuits.
IV/VII	EC6711	EMBEDDED LABORATORY	1. Write programs in ARM for a specific Application 2. Interface memory and Write programs related to memory operations 3. Interface A/D and D/A convertors with ARM system 4. Analyse the performance of interrupt 5. Write programmes for interfacing keyboard,

			display, motor and sensor.
			6. Formulate a mini project using embedded system
IV/VII	EC6712	OPTICAL AND MICROWAVE LABORATORY	1. Analyze the performance of simple optical link.
			2. Test microwave and optical components.
			3. Analyse the mode characteristics of fiber
			4. Analyse the radiation of pattern of antenna.
IV/VII	EC6801	Wireless Communication	
IV/VII	EC6802	Wireless Networks	
IV/VII	CS6003	AD HOC AND SENSOR NETWORKS	1. Explain the concepts, network architectures and applications of ad hoc and wireless sensor networks
			2. Analyze the protocol design issues of ad hoc and sensor networks
			3. Design routing protocols for ad hoc and wireless sensor networks with respect to some protocol design issues
			4. Evaluate the QoS related performance measurements of ad hoc and sensor networks
IV/VII	MG6071	ENTERPRENEURSHIP DEVELOPMENT	1. Upon completion of the course, students will be able to gain knowledge and skills needed to run a business successfully.

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