MAHENDRA COLLEGE OF ENGINEERING
(Approved by AICTE, Affiliated to Anna University, Chennai-25)
Chennai Main Road, Minnampalli
Salem – 636106

B.E. ELECTRICAL AND ELECTRONICS ENGINEERING

Program Outcomes (POs)

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

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.

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.

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.

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.

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.

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.

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

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

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.

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.

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 Outcomes (PSOs)

The students will demonstrate the abilities to

PSO 1: Apply the fundamental knowledge of mathematics, science, electrical and electronics engineering to analyze and solve the complex problems in electrical, electronics and allied interdisciplinary areas.

PSO 2: Understand and apply core domain knowledge of electrical engineering to analyze and solve complex engineering problems of machines, control systems, electronics and power systems.

PSO 3: Create conducive environment to develop professionalism, entrepreneurial skills and leadership qualities with ethics.

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CO STATEMENTS FOR B.E.ELECTRICAL AND ELECTRONICS ENGINEERING (2013 REGULATION)

SEMESTER 01

1.Course Code and Name : HS6151 - TECHNICAL ENGLISH I

	CO Statements	Knowledge Level
The students should be able to		
1	Classify the types of listening and writing skills with acquired knowledge	K2
2	Demonstrate speaking skills in various occasions	K2
3	Compare the formal and informal writing skills by using the mail and blocks	K2
4	Apply the speaking etiquitte to build up communication proficiency	K3
5	Develop presentations with the use of LSRW skills	K3
2.Course Code and Name : MA6151 - MATHEMATICS I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Solve the Eigen values and Eigen vectors to diagonalise and reduce a matrix to quadratic form	K3
2	Identify the convergences, divergences of infinite series	K3
3	Solve evolutes and envelopes of a given curve by using radius of curvature and center of curvature	K3
4	Identify the maxima and minima value functions of two variables	K3
5	Solve area of plain curves and volume of solid using double and triple integrals	K3

3.Course Code and Name : PH6151 - ENGINEERING PHYSICS I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Explain the basics of properties of matter and its applications	K2
2	Summarize the concepts of waves and optical devices and their applications in fiber optics	K2
3	Demonstrate the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers	K2
4	Outline the concepts of advanced physics quantum theory and its applications in tunneling microscopes	K2
5	Explain the basics of crystals, their structures and different crystal growth techniques	K2

4.Course Code and Name : CY6151 - ENGINEERING CHEMISTRY I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Classify the polymers and their utility in the industries and explain the techniques of polymerization and properties of polymers	K2
2	Relate various thermodynamic functions such as enthalpy, entropy, free energy and their importance	K2
3	Explain the photo physical processes such as fluorescence and phosphorescence and various components of UV and IR spectrophotometer	K2

4	Illustrate the phase transitions of one component and two component systems and the types of alloys and their application in industries	K2
5	Outline the synthesis, characteristics and the applications of nano materials	K2

5.Course Code and Name : GE6151- COMPUTER PROGRAMMING		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Describe the function of a Computer and problem solving techniques.	K2
2	Write simple C programs using basic constructs	K3
3	Implement applications to manage data using arrays and strings	K3
4	Apply functions and pointers for solving problems	K3
5	Develop simple applications using structure and union	K3

6.Course Code and Name : GE6152- ENGINEERING GRAPHICS		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Demonstrate freehand sketching of basic geometrical constructions and multiple views of objects	K2

2	Develop orthographic projections of points, lines and plane surfaces	K3
3	Construct projections of simple solids and truncated solids	K3
4	Develop projection of sectioned solids and utilize development of surfaces	K3
5	Construct isometric and perspective projections of simple solids	K3

7.Course Code and Name : GE6161- COMPUTER PRACTICES LABORATORY		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Apply the usage of office automation tools.	K2
2	Apply good programming design methods for program development.	K3
3	Design and implement C programs for simple applications.	K3
4	Develop recursive programs.	K3

8.Course Code and Name : GE6162 - ENGINEERING PRACTICES LABORATORY		
	CO Statements	**Knowledge Level**
The students should be able to		

1	Construct carpentry components and pipe connections including plumbing works	K2
2	Make use of welding equipments to join the structures	K3
3	Develop models using sheet metal work	K3
4	Illustrate the working of centrifugal pump and air conditioner	K3
5	Demonstrate basic home electrical works, measurement of the electrical quantities and soldering practices	K3

9.Course Code and Name : GE6163 - PHYSICS AND CHEMISTRY LABORATORY - I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Make use of spectrometer to find the wavelength of spectral lines, and laser	K3
2	Make use of ultrasonic interferometer and Lee's disc apparatus to find the velocity of sound, compressibility of the liquid and thermal conductivity	K3
3	Demonstrate the estimation of DO content in water sample by Winkler's method and molecular weight of polymer by Ostwald viscometer	K2
4	Experiment with the strength of an acid using pH meter and conductometer	K3
5	Demonstrate the estimation of weak and strong acids in a mixture by conductometer	K2

SEMESTER 02

	CO Statements	Knowledge Level
The students should be able to		
1	Develop the communication skills with proper grammar usage	K2
2	Summarize the various advanced technical and non-technical english tools	K2
3	Classify the speaking skills and expression through professional english	K2
4	Apply the interview techniques for career development	K3
5	Outline the use of writing skills to express innovatiove ideas	K3
2.Course Code and Name : MA6251 - MATHEMATICS II		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Apply solenoidal, irrotational vectors and make use of the concepts of Green's, Gauss divergence , Stokes theorem to evaluate single, double and triple integrals	K3
2	Solve simultaneous linear equations and P.I. of Cauchy and Legendre Equation	K3
3	Solve Laplace Transforms of periodic functions and ODE using Inverse Laplace Transform	K3
4	Make use of the properties of analytic functions for verifying C-R equations for determination of Bilinear Transformation	K3
5	Develop the functions of two variables as Taylor's and Laurent's series and Contour integrals by using Cauchy's Integral formula	K3

3.Course Code and Name : PH6251 - ENGINEERING PHYSICS II		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Explain the basics, properties and applications of conducting materials	K2
2	Summarize the properties of semiconducting materials and semiconductor devices.	K2
3	Explain the basics, properties and applications of the magnetic materials and super conducting material	K2
4	Illustrate the concepts, mechanisms and applications of dielectric materials	K2
5	Outline the method of synthesis and explain the properties of Nano materials, SMA, Metallic glasses and Ceramics	K2

4.Course Code and Name : CY6251 - ENGINEERING CHEMISTRY II		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Explain the problems of using hard water in boilers and methods of treatment of water for boiler use	K2
2	Apply the design principles to electro chemical cell. Identify the types of corrosion and the methods of prevention	K3
3	Illustrate the methods of harnessing energy from non-conventional energy sources	K2

4	Classify various engineering materials and explain their importance	K2
5	Relate the significance of solid, liquid and gaseous fuels. Explain the calorific values of fuels and air requirement for combustion in furnaces	K2

5.Course Code and Name : GE6251 -Basic Civil and Mechanical Engineering		
	CO Statements	**Knowledge Level**
The students should be able to		
1	describe the Civil and Mechanical Engineering components of Projects	K1
2	explain the usage of construction material and proper selection of construction materials	K2
3	Illustrate distances and area measuring by surveying	K2
4	identify the components used in power plant cycle and to demonstrate working principles of petrol and diese	K2
5	explain the components of refrigeration and Air conditioning cycle	K2

6.Course Code and Name : EE6201-Circuit theory		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Apply Kirchhoff's current and voltage law to simple circuits and Solve complexcircuits using Mesh & Nodal Methods.	K3

2	Apply Network theorems to solve simple and complex linear circuits.	K3
3	Solve the Series and Parallel resonance circuit, analyse the performance ofsingle & double tuned circuits.	K3
4	Develop the Transient response of RLC circuits using LaplaceTransform,explain the characteristics of two port networks.	K3
5	Explain three phase balanced and unbalanced star, delta network.	K2

7.Course Code and Name : EE6211 -Electric Circuits Laboratory		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Analyse the electrical circuits using Kirchoff's law, mesh analysis and nodal analysis	K4
2	applying suitable theorems to reduce the given complex circuit to simple circuit	K3
3	analyze transient response of RL, RC and RLC circuits.	K4
4	simulate different forms of three phase circuits.	K4
5	Identify the type of filter and calculate the resonant frequency.	K3
8.Course Code and Name :GE6262- PHYSICS AND CHEMISTRY LABORATORY - II		
	CO Statements	**Knowledge Level**
The students should be able to		

1	Illustrate the determination of Young's modulus of the beam and moment of inertia and rigidity modules of thin wire Torsion pendulum	K2
2	Make use of Poiseuille's method to determine the coefficient of viscosity of the liquid	K3
3	Illustrate the determination of dispersive power of a prism and the thickness of a thin wire through interference fringes using Air wedge apparatus	K2
4	Experiment with the type, amount of alkalinity, hardness in a given water sample and evaluate the Amount of copper using EDTA method	K3
5	Demonstrate titration by potentiometric redox and conductometric precipitation methods	K2
9.Course Code and Name : GE6263 -Computer Programming Laboratory		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Make use of MS office for Presentation and Visualization for preparing data	K3
2	Analyze the Problems and design using Flow-chart.	K4
3	Solve Problems using decision making and looping Statements.	K3
4	Solve problems using Arrays, Structures & Unions.	K3
5	Solve Problems using Recursive Functions	K3

SEMESTER 03
1.Course Code and Name : EE6301-Digital Logic Circuits

	CO Statements	Knowledge Level
	The students are able to,	
1	Construct combinational and sequential Circuits.	K3
2	Illustrate various number systems and simplify the logical expressions using Boolean functions	K2
3	Construct various synchronous and asynchronous circuits.	K3
4	Illustrate asynchronous sequential circuits and PLDs.	K2
5	Develop the application oriented logic circuits using digital simulation	K3
	2.Course Code and Name : EE6302 ELECTROMAGNETIC THEORY	
	CO Statements	**Knowledge level**
	The students are able to,	
1	Explain the basic mathematical concepts related to electromagnetic vector fields	K2
2	Explain the basic concepts about electrostatic fields, electrical potential,energy density and their applications	K2
3	Illustrate magneto static fields, magnetic flux density, vector potential and its applications	K2
4	Illustrate the different methods of emf generation and Maxwell's equations	K2
5	Explain the basic concepts electromagnetic waves and characterizing parameters	K2

3.Course Code and Name : EE6351-ENVIRONMENTAL SCIENCE AND ENGINEERING		
	CO Statements	**Knowledge Level**
	The students are able to,	
1	illustrate the concepts of an ecosystem , energy flow and conservation of biodiversity.	K2
2	explain the causes, effects and control of various types of pollution.	K2
3	plan for conservation of natural resources.	K2
4	summarize the social issues of environment and legislative guidelines for disaster management.	K2
5	relate population growth and its impact on environment and human health.	K2

4.Course Code and Name : EC6202 ELECTRONIC DEVICES AND CIRCUITS		
	CO Statements	**Knowledge Level**
	The students are able to,	
1	Explain the structure and working principle of basic electronic devices	K2
2	identify and differentiate active and passive elements	K3
3	Illustrate the characteristics of different electronic devices such as diodes and transistors	K2

4	Select the required components to construct an amplifier circuit	K3
5	Illustrate feedback amplifiers and oscillator	K2

5.Course Code and Name : EE6303-Linear Integrated Circuits and Applications		
	CO Statements	**Knowledge Level**
The students are able to,		
1	Explain the methods of Ic fabrication	K2
2	Interpret the characteristics of OP-AMP	K2
3	Identify the OP-AMP usage in electrical circuits	K3
4	Explain about special Ics	K2
5	Make use of Ics in real time application	K3

6.Course Code and Name : EC6361-Electronics Laboratory		
	CO Statements	**Knowledge Level**
The students are able to,		

1	Demonstarte the working of linear electronic circuits.	K2
2	apply the diode concept in rectifiers .	K3
3	Experiment with Switching devices in different configurations.	K3
4	demonstrate the working of oscillators, multi vibrator and differential amplifiers	K2
5	Illustrate the characteristics of Photo diode, phototransistor and LED.	K2

7.Course Code and Name : EE6311- Linear and Digital Integrated Circuits Laboratory		
	CO Statements	**Knowledge Level**
1	Compare truth table for AND, OR, EXOR, NOT, NOR, NAND gates JK FF, RS FF, D Flipflop.	K2
2	demonstrate Boolean Functions, Adder/ Subtractor circuits, Code converters, Parity generator and parity ch	K2
3	demonstrate the Encoders and Decoders, Muliplexer, demultiplexer, Counters and 40bit shift registers using	K2
4	Construct the inverting and non-inverting amplifier, adder, comparator, Integrator and Differentiator using C	K3
5	Construct a timer circuit using NE555 IC.	K3

8.Course Code and Name :MA6351- TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS		
	CO Statements	**Knowledge Level**

The students should be able to		
1	Solve differential equations using Fourier series analysis for engineering applications.	K3
2	Utilize Dirichlet's condition for finding the Fourier series of a given function	K3
3	Apply Fourier series to solve one dimensional way, one and two dimensional heat equations.	K3
4	Solve Fourier transform for a given function and make use of them to evaluate certain definite Integrals	K3
5	Solve z transforms of standard functions and make use of use them to solve difference equations	K3

SEMESTER 04		
1.Course Code and Name : MA6459 -Numerical Methods		
	CO Statements	**Knowledge level**
The students are able to,		
1	Develop the solution of algebraic and transcentendal system of linear equations	K3
2	Make use of Newton's Formula for interpolation of the values of unknown functions	K3
3	Construct the numerical values of the derivatives and integrals of unknown function	K3
4	Solve first and second order initial value problems	K3
5	Solve Numerical boundary value problems	K3

2.Course Code and Name : EE6401-Electrical Machines - I		
	CO Statements	**Knowledge Level**
	The students are able to,	
1	Apply the basic laws in the magnetic circuits, which are the foundation for all electricl machines.	K3
2	Build the equivalent circuit of transformers at different loading condition ,thereby finding their voltage regulation and e	K3
3	Interpret the electric and magnetic field interactions in electromechanical devices and machines	K2
4	Classify the DC machines based on their type of excitation	K2
5	Identify the type of speed control of DC motor in different application	K3

3.Course Code and Name : CS6456-Object Oriented Programming		
	CO Statements	**Knowledge Level**
	The students are able to,	
1	Explain the key attributes of C++ like native types and statements andimplement ADT	K2
2	Develop object oriented programs using polymorphism and data abstractionconcepts.	K3
3	Design templates, construct generics and to handle exceptions	K6

4	Develop the concept of java in creating classes, objects using arrays and controlstatements.	K3
5	Develop packages, handle exceptions and develop multi-threaded programs.	K3

4.Course Code and Name : EE6402-Transmission and Distribution		
	CO Statements	**Knowledge Level**
The students are able to,		
1	Explain the structure of power system and the operation of various types of power plants.	K2
2	Solve the single and double circuit to determine the transmission line parameters	K3
3	Explain the different types of insulators, cables and different distribution schemes	K2
4	Infer the voltage distribution in insulator strings and cables and methods to improve the same	K2
5	Compare the different types of distribution system.	K2

5.Course Code and Name :EE6403-Discrete Time Systems and Signal Processing		
	CO Statements	**Knowledge Level**
The students are able to,		
1	classify signals and systems & their mathematical representation.	K2

2	Solve the discrete time systems, various transformation techniques & their computation	K3
3	develop different types of digital filters	K3
4	Develop programmable digital signal processor & quantization effects	K3
5	explain code optimization of high level programming language code	K2

6.Course Code and Name :EE6404-Measurements and Instrumentation		
	CO Statements	**Knowledge Level**
The students are able to,		
1	Explain the basics of instruments and measurements	K2
2	Explain the principles of electrical and electronics instruments	K2
3	Compare the grounding techniques	K2
4	Explain the concepts of storage and display devices	K2
5	Explain about transducers and its working principles	K2

7.Course Code and Name :EE6411-Electrical Machines Laboratory - I		
	CO Statements	**Knowledge Level**

The students are able to,		
1	Build the equivalent circuit of transformer under different loading	K3
2	Classify the DC machines based on their type of excitation	K2
3	demonstrate the speed control of DC motor using different methods	K2
4	demonstrate the load test on DC machines to determine its efficiency	K2
5	demonstrate the suitable test on static machine to predetermine its efficiency	K2

8.Course Code and Name :CS6461-object Oriented Programming Laboratory		
	CO Statements	**Knowledge Level**
The students are able to,		
1	Implement a function of symbol table in C programming language.	K3
2	Design and implement one-pass & two-pass assembler.	K2
3	Design and implement single-pass and two- pass macro processor .	K2
4	Implement and operation of linker and loader.	K2
5	Implement structure and operations of text editor.	K2

SEMESTER 05		
1.Course Code and Name : EE6501-Power System Analysis		
	CO Statements	**Knowledge level**
	The students are able to,	
1	Explain various aspects of power system.	K2
2	Model the power system under steady state operating condition	K3
3	solve the power flow problem using numerical methods.	K3
4	Solve the system under faulted conditions.	K3
5	Model the transient behavior of power system when it is subjected to a fault.	K3

2.Course Code and Name : EE6502-Microprocessors and Microcontrollers		
	CO Statements	**Knowledge level**
	The students are able to,	
1	Explain the architecture and the concepts of 8085 microprocessor	K2
2	develop simple assembly language programming (ALP) using 8085 microprocessor	K3
3	Explain the architecture, memory organization, data & I/O transfer and interrupt concepts of 8051 microcon	K2

4	compare the functions of 8085 and 8051	K2
5	apply the usage of 8051 microcontroller in real time application	K3

3.Course Code and Name :ME6701 - Power Plant Engineering		
	CO Statements	**Knowledge level**
e students are able to,		
1	Describe the layout, construction and working of the components of a thermal power plant.	K1
2	Outline the layout, construction and working of the components of a Diesel, Gas and Combined cycle power plants	K2
3	Illustrate the layout, construction and working of the components of nuclear power plants.	K2
4	Demonstrate the layout, construction and working of the components of a Renewable energy power plants	K2
5	Explain about energy, economic and environmental issuses of Power Plants	K2

4.Course Code and Name : EE6503 -Power Electronics		
	CO Statements	**Knowledge level**
	The students are able to,	
1	compare different types of power semiconductor devices and their switching characteristics.	K2

2	explain the operation, characteristics and performance parameters of controlled converters	K2
3	explain different modulation techniques of pulse width modulated inverters.	K2
4	explain the operation of control circuits to HVDC, UPS and tap changing transformer.	K2
5	explain the operation, characteristics and performance parameters of DC-DC choppers	K2

5.Course Code and Name : EE6504 - Electrical Machines II

	CO Statements	**Knowledge level**
	The students are able to,	
1	Explain and Evaluate the constructional details, performance of salient and non – salient type synchronous generators and Regulation of alternator.	K5
2	Illustrate the Principle of operation and performance of synchronous motor	K2
3	Explain the construction, principle of operation and performance of induction machines.	K2
4	List the different types of starting and speed control of three phase induction motors.	K1
5	Outline the construction, principle of operation and performance of single phase induction motors and special machines.	K2

6.Course Code and Name : IC6501 - Control Systems

	CO Statements	Knowledge level
	The students are able to,	
1	Illustrate various modeling techniques for control systemdesign	K2
2	Analyse the control systems using different methods	K4
3	Analyse frequency domain analysis of control systems required for stability analysis	K4
4	Analyse the compensation techniques that can be used to stabilize control systems	K4
5	analyse state variables of the system	K4

7.Course Code and Name : EE6511 - Control and Instrumentation Laboratory

	CO Statements	Knowledge level
	The students are able to,	
1	Apply control engineering tools using both analog and digital techniques.	K3
2	Apply Laplace transform, transfer functions, modeling RLC circuit, block diagrams for simulation and contr	K3
3	Demonstrate experiments to measure system parameters	K2

4	Design a Lead, lag and lead-lag compensator.	K6
5	Analyse the signal conditioning units using MATLAB	K4
8.Course Code and Name : GE6674 - Communication and Soft Skills- Laboratory Based		
	CO Statements	**Knowledge level**
The students are able to,		
1	Demonstrate reading and writing skills	K2
2	Develop listening and speaking skills	K3
3	Make use of acquired knowledge to take up international examination such as IELTS and TOEFL	K3
4	Apply the interview techniques for career development	K3
5	Illustrate the various aspects of soft skills	K2
9.Course Code and Name : EE6512 - Electrical Machines Laboratory - II		
	CO Statements	**Knowledge level**
The students are able to,		
1	determine the regulation of three phase alternator by EMF, MMF,ZPF and ASA methods.	K3
2	determine the negative sequence and zero sequence impedance of alternators.	K3
3	demonstrate the test on synchronous motor to draw V and Inverted V curves.	K2

4	demonstrate the suitable test on threephase induction motor, single phase induction motor and find the perfo	K6
5	demonstrate speed control of three phase induction motor by v/f method	K4

SEMESTER 06		
	CO Statements	**Knowledge level**
The students are able to,		
1	Illustrate different methods of analog communication and their significance	K2
2	Summarize the methods of Digital Communication for high bit rate transmission	K2
3	Apply the concepts of source and line coding techniques for efficient transmission without errors	K2
4	Explain the various Multiple Access Techniques	K2
5	Outline the various media for digital communication	K2
2.Course Code and Name : EE6601 - Solid State Drives		
	CO Statements	**Knowledge level**
The students are able to,		
1	Classify the various types of drives and load torque characteristics and Apply the multi quadrant dynamics in	K2
2	Analyze the operation of steady state analysis of single phase and three phase fully controlled converter and	K4

3	control of induction motor.	K2
4	Relate the operation of various modes of V/f control of synchronous motor drives and different types of perr	K2
5	motor, load and converter, closed loop control with current and speed feedback.	K6
3.Course Code and Name : EE6602 - Embedded Systems		
	CO Statements	**Knowledge level**
The students are able to,		
1	Explain building blocks of embedded systems	K2
2	describe Various Embedded Development Strategies	K1
3	Develop Bus Communication in processors, Input/output interfacing.	K3
4	IllustrateVarious processor scheduling algorithms.	K2
5	describe the Basics of Real time operating system	K1
4.Course Code and Name : EE6603 - Power System Operation and Control		
	CO Statements	**Knowledge level**
The students are able to,		
1	Analyse the various load characteristics with load curve and load duration curve.	K4
2	Describe modelling of power-frequency dynamics and design power-frequencycontroller.	K1

3	Explain the modelling of reactive power-voltage interaction and the control actions.	K1
4	Solve economic dispatch problems and unit commitment problems in powersystems.	K3
5	Explain the need of computer controls to energy management using SCADA.	K1
5.Course Code and Name : EE6604 - Design of Electrical Machines		
	CO Statements	**Knowledge level**
The students are able to,		
1	Compare Electrical Engineering materials; determine heat dissipation due to Conduction, convection and rad	K2
2	Determine themmf for slots and teeths, apparent flux density, main dimensions and winding details of DC ma	K5
3	Design core, yoke, winding and cooling system of transformers.	K6
4	Create the output equation of AC machines, design stator and rotor of induction machines.	K6
5	Design the stator and rotor of synchronous machines analyze their thermal behavior, design field systems for	K6
6.Course Code and Name : EE6002 - Power System Transients		
	CO Statements	**Knowledge level**
The students are able to,		
1	Explain about switching transients and its control	K2
2	Explain the lightning strokes and production of lighting surges	K2

3	Describe the propagation, reflection and refraction of travelling waves.	K1
4	Explain the concept of voltage transients caused by faults	K2
5	Illustrate the concepts of circuit breaker action, load rejection on integrated power system.	K2
7.Course Code and Name : EE6611 - Power Electronics and Drives Laboratory		
	CO Statements	**Knowledge level**
The students are able to,		
1	analyze characteristics of AC to DC fully controlled converter, half-controlled converter and choppers	K4
2	analyze characteristics of single phase and three phase IGBT PWM inverter	K4
3	Analyse characteristics of resonant converter and cycloconverter.	K4
4	Analyse characteristics of Ac voltage controller	K4
7.Course Code and Name : EE6612 - Microprocessors and Microcontrollers Laboratory		
	CO Statements	**Knowledge level**
The students are able to,		
1	develop simple assembly language programs using 8085 microprocessor.	K4
2	develop interface with 8085 with I/O and serial communication	K4
3	develop simple applications with 8051 using basic instructions, I/O programming and motor control	K4

4	analyse the integration of motors with 8085 micro controllers	K5
5	demonstrate an experiment to interface various devices.	K4
8.Course Code and Name : EE6613 - Presentation Skills and Technical Seminar		
	CO Statements	**Knowledge level**
The students are able to,		
1	study advanced engineering developments	K4
2	prepare and present technical reports	K4
3	Project their ideas in smart presentation	K4
4	develope eye contact and body language	K5

SEMESTER 07
1.Course Code and Name : EI6703-Fibre Optics and Laser Instrumentation

	CO Statements	**Knowledge level**
The students are able to,		
1	Illustrate the basic concepts of optical fibres	K2

2	Summarize the industrial application of optical fibre	K2
3	Explain the basic concepts of laser	K2
4	Summarize the industrial application of laser	K2
5	Outline the industrial application of Holography and medical application of lasers	K2
2.Course Code and Name : EE6701 - High Voltage Engineering		
	CO Statements	**Knowledge level**
The students are able to,		
1	explain the causes of over voltages in power systems	K2
2	infer the concept of dielectric breakdown	K2
3	explain the methods of generation of high voltage and currents	K2
4	explain the methods of measurements of high voltage and high currents	K2
5	explain about insulation coordination and high voltage testing	K2
3.Course Code and Name : EE6702 - Protection and Switchgear		
	CO Statements	**Knowledge level**
The students are able to,		
1	describe the causes of abnormal operating conditions and the protection schemes equipped for it.	K1

2	analyze the characteristics and functions of different types of electromagnetic relays.	K2
3	Explain the concepts of protection of apparatus used in power system.	K2
4	Illustrate the concepts of numerical protection and characteristics of static relays.	K2
5	explain the construction and working of different types of circuit breakers.	K2
4.Course Code and Name : EE6703 - Special Electrical Machines		
	CO Statements	**Knowledge level**
The students are able to,		
1	Explain the necessity to improve the saliency of synchronous reluctance motor and its characteristics.	K2
2	Compare the various methods of excitation of different types of stepper motor and its driver circuits.	K2
3	Illustrate the operation of switched reluctance motor with and without sensors.	K2
4	Outline the electronic commutation of permanent magnet brushless D.C. motors and to determine the torque production.	K2
5	Develop the expression for emf and torque of permanent magnet synchronous motors and choose power controller for permanent magnet synchronous motors.	K3
5.Course Code and Name : EE6703 - MG6851 - Principles of Management		
	CO Statements	**Knowledge level**
The students are able to,		
1	Infer the basic of management and its types, skills, management roles, types of business organizations and current trends in business.	K2

2	Explain the nature and purpose of planning , types, objective of planning and decision process.	K2
3	Compare the different organization structures, Authorities and responsibilities, Human resource management and training and development.	K2
4	Outline the individual and group behavior, motivation, job satisfaction, types and theories of leadership, communication and IT.	K2
5	Summarize using the various System and process of controlling, budgetary and non-budgetary control techniques, use of computers and IT in	K2
6.Course Code and Name : GE6081 Fundamentals of Nanoscience		
	CO Statements	**Knowledge level**
The students are able to,		
1	Summarize the impacts of nanotechnology, classification and properties of nanomaterials.	K2
2	Classify the types of preparation methods of nanomaterials.	K2
3	Explain the properties, synthesis methods and applications of nano carbon and metal oxides.	K2
4	Classify the characterization techniques of nanomaterials.	K2
5	Demonstrate the applications of nanoscience and nanotechnology.	K2
7.Course Code and Name : EE6711 - Power System Simulation Laboratory		
	CO Statements	**Knowledge level**
The students are able to,		
1	Describe the Formation of Bus Admittance and Impedance Matrices and Solution of Networks	K1

2	analyze the power flow using GS and NR method	K2
3	locate Symmetric and Unsymmetrical fault	K2
4	explain the concept of economic dispatch	K2

SEMESTER 08		
1.Course Code and Name : EE6801 - Electric Energy Generation, Utilization and Conservation		
	CO Statements	**Knowledge level**
	The students are able to,	
1	Name the traction motors, list the traction motor control, track equipment and collection gear.	K1
2	Summarize different light sources and design various illumination systems for the indoor lighting schemes, factory lighting, halls, outdoor lighting schemes, flood lighting, street lighting.	K2
3	Compare the different methods of electric heating and types of electric welding.	K2
4	Estimate average solar radiation and illustrate the physical principles of the conversion of solar radiation into heat.	K5

5	Analyze aerodynamic forces acting on the blade and draw basic components of a WECS.	K4
2.Course Code and Name : EE6010 - High Voltage Direct Current Transmission		
	CO Statements	**Knowledge level**
The students are able to,		
1	Describe the concept, planning of DC power transmission and comparison with AC Power transmission	K1
2	Analyze HVDC converters	K4
3	Explain about HVDC control systems	K2
4	Analyze harmonics and design of filters.	K4
5	Analyse DC system under steady state	K4
3.Course Code and Name : EE6811 - Project Work		

	CO Statements	Knowledge level
The students are able to,		
1	develop the ability to solve a specific problem right from its identification and literature review	K3
2	Solve problems by formulating proper methodology	K3
3	explain their projects and prepare the project as a reports	K2
4	design the suitable circuit model related to the project using suitable softwares	K6

4.Course Code and Name : GE6075 Professional Ethics in Engineering		
	CO Statements	**Knowledge Level**

The students are able to		
1	Illustrate the principles of human values	K2
2	Demonstrate the techniques and theories of Engineering Ethics	K2
3	Explain the procedure for Engineering As Social Experimentation	K2
4	Summarize the concept of Safety, Responsibilities And Rights	K2
5	Explain the different Global Issues	K2