Asansol Engineering College
Department of Electrical Engineering
COURSE OUTCOMES (COs)

Program:-B. Tech in Electrical Engineering

Course Code	Course Outcome
Course Outcome of BS CH101	
After successful completion of the course BS CH101,students will be able to	
BS CH101.1	Inculcates among the students the ability to understand English when written and spoken.
BS CH101.2	Generates the ability to connect and develop reading and writing skills.
BS CH101.3	Develops their verbal and non- verbal communication skills in expressing themselves.
BS CH101.4	Helps them to become more expressive in a global platform.
BS CH101.5	Develops their employability skills by reframing the ability to articulate.
BS CH101.6	Provides them the corporate readiness and preparedness in terms of compiling professional documentation.
Course Outcome of BS M102	
After successful completion of the course *BS M102* ,students will be able to	
BS M102.1	Explain atomic and molecular structure analyse microscopic chemistry in terms of atomic and molecular orbitals.
BS M102.2	Understand spectroscopic techniques and their applications.distingush the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques.
BS M102.3	Discuss intermolecular forces and potential energy surfaces.
BS M102.4	Establish the use of free energy in chemical equilibria and rationalise bulk properties and processes using themodynamic considerations.
BS M102.5	Generalise periodic properties such as ionization potential, electronegativity, oxidation states.
BS M102.6	Describe stereochemistry and list major chemical reactions that are used in the synthesis of molecules.
Course Outcome of ES-EE101	
After successful completion of the course *ES-EE101* ,students will be able to	
ES-EE101.1	understand the basics of electrical circuits, circuit parameters and components
ES-EE101.2	interpret different AC circuits
ES-EE101.3	develop the knowledge on fundamentals of transformer and its performance
ES-EE101.4	identify the role of different electrical machines
ES-EE101.5	develop knowledge in Power Converters
ES-EE101.6	relate the applications of different switchgear in electrical installations
Course Outcome of BS CH191	
After successful completion of the course *BS CH191* ,students will be able to	
BS CH191.1	Estimate the chloride ion in a given water sample by Argentometric method (using chromate indicator solution).
BS CH191.2	Determine the partition coefficient of a substance (acetic acid) between two immiscible liquids (water and n- butanol).
BS CH191.3	Calculate the value of dissolved oxygen present in a given water sample.
BS CH191.4	Examine the strength of a given HCl solution against a standard NaOH solution by help of pH- metric titration method.

BS CH191.5	Experiment the strength of a given HCl solution by the titration against a standard NaOH solution using Conductometric titration method.
BS CH191.6	Establish the viscosity of a liquid at various concentrations by Oswald's Viscometer.

Course Outcome of ES-EE191	
After successful completion of the course *ES-EE191* ,students will be able to	
ES-EE191.1	Identify the various electrical meters and instruments.
ES-EE191.2	Establish the condition of resonance in R-L-C series and parallel circuit.
ES-EE191.3	Calibrate the various measuring instruments (like ammeter and wattmeter etc.) to determine instrument error.
ES-EE191.4	Determine the equivalent circuit parameters of a single phase transformer.
ES-EE191.5	Simulate in PSPICE for performing transient analysis of R-L, R-C, and R-L-C series circuit.
ES-EE191.6	Calculate the power factor of three phase system by two wattmeter method.

Course Outcome of ES-ME191	
After successful completion of the course *ES-ME191* ,students will be able to	
ES-ME191.1	Estimate the total iron content in any water sample by Redox titration using potassium permanganate through Mohr's method.
ES-ME191.2	Determine the total hardness (calcium and magnesium) of water sample.
ES-ME191.3	Calculate the partition coefficient of acetic acid between n-butanol and water through heterogeneous equilibrium method.
ES-ME191.4	Examine the strength of a given HCl solution by titration against a standard NaOH solution through conductometric titration.
ES-ME191.5	Experiment the strength of a given HCl solution against a standard NaOH solution through pH- metric titration.
ES-ME191.6	Establish the amount of dissolved oxygen in water sample by Winler'siodometric method.

Course Outcome of BS-PH201	
After successful completion of the course *BS-PH201* ,students will be able to	
BS-PH201.1	Describe about the Basic concepts of mechanics
BS-PH201.2	Explaininterference, diffraction and polarization of light.
BS-PH201.3	Statethe basic principles of LASER and construction of Ruby LASER , He-Ne LASER.
BS-PH201.4	Interpret about electromagnetic wave equation, dielectric and magnetic properties of materials.
BS-PH201.5	Understand the basics of Quantum Mechanics.
BS-PH201.6	Discuss about the basics and applications of Statistical Mechanics

Course Outcome of BS-M202	
After successful completion of the course *BS-M202* ,students will be able to	
BS-M202.1	Match the application of elementary geometry they have learned.
BS-M202.2	Relate the present learning to day to day application.
BS-M202.3	Identify how complex problem is being solved by using different methods.
BS-M202.4	Divide a complex problem into finite number of part and individually address them in elementary method.
BS-M202.5	Asses the steps followed in solving a problem and necessary corrective measures may be taken.

Course Outcome of ES-CS201	
After successful completion of the course *ES-CS201* ,students will be able to	
ES-CS201.1	Inculcate within themselves the importance of listening , comprehending and reading, which in turn, fosters communication which ensures empathy, trust, confidence and a better understanding of the subject matter with a wide range of vocabulary, voice modulation, ability to summarize the subject matter with precision respectively.
ES-CS201.2	Develops their employability skills by generating the ability to articulate.
ES-CS201.3	Develops their analytical skills and inculcates in them power of decision making through interpersonal relationship building.
ES-CS201.4	Infuses the managerial skills with sophisticated manners, etiquette, articulate courtesies in terms of interpersonal and telephonic communication.
ES-CS201.5	Provides them the corporate readiness and develops team building skills and develops their overall personality.

Course Outcome of HM-HU201	
After successful completion of the course HM-HU201,students will be able to	
HM-HU201.1	distinguish between various type signals or systems.
HM-HU201.2	analyze various electrical and coupled circuits using various network analysis methods and theorems.
HM-HU201.3	determine AC and DC steady state and/or transient performance of electrical circuits using Fourier and/or Laplace transform.
HM-HU201.4	prepare directed graphs for various electrical networks
HM-HU201.5	evaluate different two port network parameters for electrical networks.
HM-HU201.6	select various active filter circuit parameters.

Course Outcome of BS-PH291	
After successful completion of the course BS-PH291,students will be able to	
BS-PH291.1	apply vector analysis in different coordinate systems.
BS-PH291.2	relate the properties of vector field using mathematical principles.
BS-PH291.3	explain different phenomena related to electrostatic field.
BS-PH291.4	distinguish the properties of magnetostatic field with electrostatic field.
BS-PH291.5	deduce different mathematical expressions of electromagnetic field.
BS-PH291.6	determine properties of em wave propagation which are applied in the principles of transmission lines.

Course Outcome of ES-CS291	
After successful completion of the course ES-CS291,students will be able to	
ES-CS291.1	Describe the theory of different type of vibrational motion like SHM, damped vibration and forced vibration and its application in electrical circuit.
ES-CS291.2	Explain the theory and applications of interference, diffraction and polarization of electromagnetic waves.
ES-CS291.3	State the basic principles of LASER and construction of Ruby LASER and He-Ne LASER.
ES-CS291.4	Interpret the explanation of some phenomena like black body radiation, Compton scattering using the concept of quantum nature of electromagnetic wave and know the wave-particle duality of matter.

ES-CS291.5	Classify the different types of crystal structure.
ES-CS291.6	Discuss the origin and characteristics of x-ray .

Course Outcome of ES-ME292	
After successful completion of the course ES-ME292,students will be able to	
ES-ME292.1	Describe the theory of different type of vibrational motion like SHM, damped vibration and forced vibration and its application in electrical circuit.
ES-ME292.2	Explain the theory and applications of interference, diffraction and polarization of electromagnetic waves
ES-ME292.3	State the basic principles of LASER and construction of Ruby LASER and He-Ne LASER.
ES-ME292.4	Interpret the explanation of some phenomena like black body radiation, Compton scattering using the concept of quantum nature of electromagnetic wave and know the wave-particle duality of matter.
ES-ME292.5	Classify the different types of crystal structure.
ES-ME292.6	Discuss the origin and characteristics of x-ray .

Course Outcome of HM-HU291	
After successful completion of the course HM-HU291,students will be able to	
HM-HU291.1	define the role of Electrostatics and related laws & principles
HM-HU291.2	develop knowledge in DC machines,its construction and applications
HM-HU291.3	identify the role of single phase transformer in electrical engineering
HM-HU291.4	distinguish the different gate isolation techniques
HM-HU291.5	analyze different opamp circuits
HM-HU291.6	solve dfifferent binary problems

Course Outcome of PC-EE 301	
After successful completion of the course PC-EE 301,students will be able to	
PC-EE 301.1	Classify different types of signal or systems and identify a set of algebraic equations to represent them.
PC-EE 301.2	analyze various electrical and coupled circuits using various network analysis methods and theorems.
PC-EE 301.3	determine AC and DC steady state and/or transient performance of electrical circuits using Fourier and/or Laplace transform.
PC-EE 301.4	prepare directed graphs for various electrical networks
PC-EE 301.5	evaluate different two port network parameters for electrical networks.
PC-EE 301.6	select various active filter circuit parameters.

Course Outcome of PC-EE 302	
After successful completion of the course PC-EE 302,students will be able to	
PC-EE 302.1	Understand the structure and properties of different components of analog electronics
PC-EE 302.2	Explain principle of operation of analog electronics components and circuits.
PC-EE 302.3	Understand the application of operational amplifier
PC-EE 302.4	Solve problems of analog electronic components and circuits
PC-EE 302.5	Analyze amplifiers, oscillators and other analog electronic circuits.
PC-EE 302.6	Calculate the value of inductance, capacitance and frequency using different bridge circuit.

Course Outcome of PC-EE 303	
After successful completion of the course PC-EE 303,students will be able to	
PC-EE 303.1	apply vector analysis in different coordinate systems
PC-EE 303.2	relate the properties of vector field using mathematical principles
PC-EE 303.3	explain different phenomena related to electrostatic field
PC-EE 303.4	distinguish the properties of magnetostatic field with electrostatic field
PC-EE 303.5	deduce different mathematical expressions of electromagnetic field
PC-EE 303.6	determine properties of em wave propagation which are applied in the principles of transmission lines

Course Outcome of ES-ME 301	
After successful completion of the course ES-ME 301,students will be able to	
ES-ME 301.1	identify the role of callibration of ammeter & wattmeter in engineering
ES-ME 301.2	determine the equivalent circuit parameters of transformer using open circuit & short circuit test of a single phase transformer
ES-ME 301.3	observe the No Load Characteristics of DC generator
ES-ME 301.4	relate the theoritical process of speed control by conducting the Speed Control of DC shunt motor experiment practically
ES-ME 301.5	establish a relation between speed control & reversal of speed in dc motor
ES-ME 301.6	apply the theoretical knowledge of three phase system in calculating the power factor of three phase system

Course Outcome of BS-M 301	
After successful completion of the course BS-M 301,students will be able to	
BS-M 301.1	Summarize manufacturing and engineering materials, including the importance, applications and safety in different shops for the development of components.
BS-M 301.2	Choose suitable tools for different primary manufacturing processes
BS-M 301.3	Demonstrate different machine tools and machining processes.
BS-M 301.4	Apply knowledge and techniques to make different components using different manufacturing processes.
BS-M 301.5	Build different welded joints.

Course Outcome of BS-EE 301	
After successful completion of the course BS-EE 301, students will be able to	
BS-EE 301.1	*sketch* with 8085 microprocessor architecture, communication & bus timings, instructions etc.
BS-EE 301.2	*outline* of memory & I/O interfacing, stack & subroutine and interrupts.
BS-EE 301.3	*organize* to design peripheral devices and interfacing with 8085 microprocessor.
BS-EE 301.4	*develop* to write assembly level language programming (in 8085), compiler, assembler, linker & debugger.
BS-EE 301.5	*prepare* with 16-bit 8086 microprocessor architecture & its operating modes.
BS-EE 301.6	*associate* of 8051 microcontroller & its architecture, programming & interfacing.

Course Outcome of MC-EE 301	
After successful completion of the course MC-EE 301,students will be able to	
MC-EE 301.1	perform different experiments on three phase induction motors

MC-EE 301.2	organize different tests on synchronous motor and generator, respectively.
MC-EE 301.3	observe equivalent circuit parameters and load test of a single phase Induction motor.
MC-EE 301.4	represent connection diagram of squirrel cage induction motor for 6-pole & 4-pole operations.
MC-EE 301.5	describe performance of Induction generator.
MC-EE 301.6	outline V-curve of synchronous motor

Course Outcome of PC-EE 391	
After successful completion of the course PC-EE 391,students will be able to	
PC-EE 391.1	Tabulate the behaviour of different electrical networks using DC sweep analysis in PSPICE.
PC-EE 391.2	Determine transient response of RL and RC networks using PSPICE.
PC-EE 391.3	Examine transient response of series and parallel RLC circuits using PSPICE
PC-EE 391.4	Solve network analysis problems using network theorems with PSPICE.
PC-EE 391.5	Compute the Laplace and inverse Laplace transform of various functions using MATLAB.
PC-EE 391.6	Sketch the waveform of various periodic & a periodic signals using MATLAB

Course Outcome of PC-EE 392	
After successful completion of the course PC-EE 392,students will be able to	
PC-EE 392.1	determine characteristics of full wave rectifier with filter and without filter
PC-EE 392.2	verify function of DAC and ADC
PC-EE 392.3	to construct VCO and PLL
PC-EE 392.4	validate theoretical learning with practical

Course Outcome of PC-CS 391	
After successful completion of the course PC-CS 391 ,students will be able to	
PC-CS 391.1	Classify different types of signal or systems and identify a set of algebraic equations to represent them.
PC-CS 391.2	analyze various electrical and coupled circuits using various network analysis methods and theorems.
PC-CS 391.3	determine AC and DC steady state and/or transient performance of electrical circuits using Fourier and/or Laplace transform.
PC-CS 391.4	prepare directed graphs for various electrical networks
PC-CS 391.5	evaluate different two port network parameters for electrical networks.
PC-CS 391.6	select various active filter circuit parameters.

Course Outcome of PC-EE 401	
After successful completion of the course PC-EE 401,students will be able to	
PC-EE 401.1	understand the principle of electromechanical energy conversion and its physical significance in electrical machines
PC-EE 401.2	learn the construction and operating principle of DC machines
PC-EE 401.3	justify the application of DC machines for industrial and domestic purposes
PC-EE 401.4	illustrate the construction and working of poly-phase induction motor
PC-EE 401.5	infer principle of operation, connection and test parameters for 3-phase transformer
PC-EE 401.6	categorize various instrument transformers besd on its application in power system and communication lines etc.

Course Outcome of PC-EE 402	
After successful completion of the course PC-EE 402,students will be able to	
PC-EE 402.1	To learn the fundamentals of Digital systems and principle of operation of Logic families.
PC-EE 402.2	To learn the principle of operation of Combinational digital circuits.
PC-EE 402.3	To learn the principle of operation of sequential circuit and systems.
PC-EE 402.4	To learn the principle of operation of A/D and D/A converter
PC-EE 402.5	To learn the principle of operation of semiconductor memories and Programmable logic devices.
PC-EE 402.6	To acquire problem solving skills to solve problems of Digital circuits

Course Outcome of PC-EE 403	
After successful completion of the course PC-EE 403,students will be able to	
PC-EE 403.1	To learn methods of measurement, errors in measurement and its classification.
PC-EE 403.2	To learn the principle of operation of analog and digital meters
PC-EE 403.3	To learn the basic principle of operation of instrument transformers
PC-EE 403.4	To learn the principle of operation of cathode ray oscilloscope and different sensors and transducer transducers.
PC-EE 403.5	To learn the principle of measurement of power, energy and different electrical parameters
PC-EE 403.6	To acquire problem solving skills to solve problems on the topics studied

Course Outcome of ES-EE 401	
After successful completion of the course ES-EE 401,students will be able to	
ES-EE 401.1	tabulate the behaviour of different electrical networks using DC sweep analysis in PSPICE.
ES-EE 401.2	determine transient response of RL and RC networks using PSPICE.
ES-EE 401.3	examine transient response of series and parallel RLC circuits using PSPICE
ES-EE 401.4	solve network analysis problems using network theorems with PSPICE.
ES-EE 401.5	compute the Laplace and inverse Laplace transform of various functions using MATLAB.
ES-EE 401.6	sketch the waveform of various periodic & a periodic signals using MATLAB

Course Outcome of HM-EE 401	
After successful completion of the course HM-EE 401,students will be able to	
HM-EE 401.1	identify various MATLAB commands associated with state space analysis.
HM-EE 401.2	solve system equations in state-variable form (state variable models) using MATLAB
HM-EE 401.3	determine the gains of state feedback controller, state observer and observer based state feedback controller using MATLAB.
HM-EE 401.4	examine the performance of a discrete time system using MATLAB.
HM-EE 401.5	simulate various systems for determination of phase trajectories using SIMULINK
HM-EE 401.6	illustrate describing function of various nonlinearities using Hardware setup.

Course Outcome of MC-EE 401	
After successful completion of the course MC-EE 401,students will be able to	
MC-EE 401.1	Discuss different simple and complex dynamical problems of different classical bodies using Lagrangian and Hamiltonian mechanics.
MC-EE 401.2	State the classical limit of a body and interpret quantum mechanical behaviour of a body in different potential profile such as step potential, infinite potential well, tunneling effect etc.

MC-EE 401.3	Define phase space, microstate, and macrostate and illustrate different types of statistics to explain blackbody radiation, Fermi energy, average energy and energy band gap.
MC-EE 401.4	Explain the concept of polarization, its types; different electric vectors.
MC-EE 401.5	Describe magnetic properties in matter, types of magnetism and their properties.
MC-EE 401.6	Summarize different crystal structures, free electron theory for calculation of electrical conductivity or thermal conductivity and formation of band structure.

Course Outcome of PC-EE 491	
After successful completion of the course PC-EE 491,students will be able to	
PC-EE 491.1	perform experiment related to DC motor and generator, respectively.
PC-EE 491.2	deduce the equivalent circuit of a single phase transformer.
PC-EE 491.3	test the polarity of a single phase transformer.
PC-EE 491.4	distinguish between no load and blocked rotor test of three phase Induction motor test.
PC-EE 491.5	evaluate performance of wound rotor Induction motor under load.
PC-EE 491.6	observe performance of three phase squirrel cage induction motor by determining iron-loss, friction & windage loss.

Course Outcome of PC-EE 492	
After successful completion of the course PC-EE 492,students will be able to	
PC-EE 492.1	identify appropriate equipment and instruments for the experiment
PC-EE 492.2	test the instruments for application to the experiment
PC-EE 492.3	construct decoder , multiplexer, adder and subtractor circuits with appropriate instruments and precaution
PC-EE 492.4	realize RS-JK and D flip flop, universal register with gates, multiplexer and flip-flops and asynchronous and synchronous up down counters
PC-EE 492.5	validate the operation of code conversion circuit –BCD to Excess 3 & vice versa, 4 bit parity generator & comparator circuits
PC-EE 492.6	work effectively in a team

Course Outcome of PC-EE 493	
After successful completion of the course PC-EE 493,students will be able to	
PC-EE 493.1	Observation of the construction of different types of analog meters.
PC-EE 493.2	Be able to calibrate different type of ammeter, voltmeter, wattmeter, energy meter.
PC-EE 493.3	Be able to measure resistance using Kelvin double bridge
PC-EE 493.4	Have idea of measurement of power in polyphase circuit
PC-EE 493.5	Have idea of measurement of power using instrument transformer
PC-EE 493.6	Have idea of measurement of inductance, capacitance and frequency

Course Outcome of ES-ME 491	
After successful completion of the course ES-ME 491,students will be able to	
ES-ME 491.1	Introductory idea about measurement systems and measuring instruments
ES-ME 491.2	Knowledge of various types of analog meters with their advantage and disadvantages
ES-ME 491.3	Proficiency in measurement of resistance, inductance, capacitance and frequency
ES-ME 491.4	Proficiency in instrument transformers and their application and measurement, voltage, power and energy
ES-ME 491.5	Basic knowledge of Cathode Ray Oscilloscope and its application
ES-ME 491.6	Preliminary knowledge of Electronic Instruments, Sensors and Transducer.

Course Outcome of PC-EE 501

After successful completion of the course PC-EE 501,students will be able to

PC-EE 501.1	learn the construction and working principle of the single phase induction motor
PC-EE 501.2	relate the application of single phase induction motor for various purposes
PC-EE 501.3	elaborate the construction and working principle of the synchronous machines
PC-EE 501.4	analyze the operational modes of alternator under various excitation
PC-EE 501.5	explain the construction and working principle of the special machines like hysteresis motor, stepper motor, reluctance motor etc.
PC-EE 501.6	apply the concept of ac machines to serve various day-to-day purposes

Course Outcome of PC-EE 502

After successful completion of the course PC-EE 502,students will be able to

PC-EE 502.1	discuss different types of tariff and different forms of Electric Power Generation and Electricity rules
PC-EE 502.2	differentiate the various types of parameters of Overhead transmission line
PC-EE 502.3	illustrate overhead line construction (sag, tension,corona, etc)
PC-EE 502.4	explain different types of Insulators
PC-EE 502.5	analyze Performance of lines
PC-EE 502.6	compare different types of Cables along with their diffferent parameters

Course Outcome of PC-EE 503

After successful completion of the course PC-EE 503,students will be able to

PC-EE 503.1	develop mathematical model of mechanical, electrical, thermal, fluid system and different control system components.
PC-EE 503.2	analyze performance and stability of LTI system using various methods in time as well as frequency domain.
PC-EE 503.3	sketch and interpret various plots (such as root locus, bode plot, polar plot, nyquits plot etc.).
PC-EE 503.4	design different control law or algorithms for LTI systems
PC-EE 503.5	apply state variable techniques for analysis of linear systems.
PC-EE 503.6	Design linear state feedback controller and obsterver for LIT systems using different method.

Course Outcome of PC-EE 504

After successful completion of the course PC-EE 504,students will be able to

PC-EE 504.1	differentiate between signal level and power level devices.
PC-EE 504.2	construct triggering and commutation circuits of SCR.
PC-EE 504.3	explain the principle of operation of AC-DC, DC-DC and DC-AC converters.
PC-EE 504.4	analyse the performance of AC-DC, DC-DC and DC-AC converters.
PC-EE 504.5	apply methods of voltage control and harmonic reduction to inverters.
PC-EE 504.6	solve numerical problems of switching devices, AC-DC, DC-DC and DC-AC converters.

Course Outcome of PC-EE 501C

After successful completion of the course PC-EE 501C,students will be able to

PC-EE 501C.1	Interpret role of renewable & non renewable sources of energy

PC-EE 501C.2	explain the application of solar energy, wind energy & energy from biomass
PC-EE 501C.3	differentiate between geothermal energy & energy from ocean
PC-EE 501C.4	illustrate the role of MHD power generation in real life
PC-EE 501C.5	describe the generation of hydrogen energy
PC-EE 501C.6	iIdentify the working of fuel cell

Course Outcome of OE EE501B	
After successful completion of the course OE EE501B,students will be able to	
OE EE501B.1	learn the construction and working principle of the single phase induction motor
OE EE501B.2	relate the application of single phase induction motor for various purposes
OE EE501B.3	teach the construction and working principle of the synchronous machines
OE EE501B.4	analyze the operational modes of alternator under various excitation
OE EE501B.5	explain the construction and working principle of the special machines like hysteresis motor, stepper motor, reluctance motor etc.

Course Outcome of PC-EE 591	
After successful completion of the course PC-EE 591,students will be able to	
PC-EE 591.1	perform different experiments on three phase induction motors
PC-EE 591.2	organize different tests on synchronous motor and generator, respectively.
PC-EE 591.3	observe equivalent circuit parameters and load test of a single phase Induction motor.
PC-EE 591.4	represent connection diagram of squirrel cage induction motor for 6-pole & 4-pole operations.
PC-EE 591.5	describe performance of Induction generator.
PC-EE 591.6	outline V-curve of synchronous motor

Course Outcome of PC-EE 592	
After successful completion of the course PC-EE 592,students will be able to	
PC-EE 592.1	determine the generalized constants A.B, C, D of long transmission line.
PC-EE 592.2	determine the breakdown strength of solid insulating material.
PC-EE 592.3	distinguish different types of insulator.
PC-EE 592.4	determine the Dielectric strength test of insulating oil.
PC-EE 592.5	measure the earth resistance by earth tester.
PC-EE 592.6	analyze an electrical transmission line circuit with the help of PSPICE.

Course Outcome of PC-EE 593	
After successful completion of the course PC-EE 593,students will be able to	
PC-EE 593.1	identify various commands associated with MATLAB control system toolbox
PC-EE 593.2	determine the Step response and *calculate* various performace indices for different systems using MATLAB/Hardware setup.
PC-EE 593.3	select the suitable PI, PD and PID controller action of various simulated process based on responses obtained using MATLAB and SIMULINK.
PC-EE 593.4	sketch and interpret Root locus, Bode plot, Nyquist plot using MATLAB.
PC-EE 593.5	Design Lead, Lag and Lead-Lag compensation for the given plant transfer function using MATLAB.
PC-EE 593.6	Solve system equations in state-variable form (state variable models) and *determine* the gains of state feedback controller using MATLAB.

Course Outcome of PC-EE 594	
After successful completion of the course PC-EE 594,students will be able to	
PC-EE 594.1	identify appropriate equipment and instruments for the experiment.
PC-EE 594.2	test the instrument for application to the experiment.
PC-EE 594.3	construct circuits with appropriate instruments and safety precautions.
PC-EE 594.4	validate characteristics of SCR, Triac, and performance of phase controlled converter, DC-DC converter, inverters and resonant pulse converters.
PC-EE 594.5	demonstrate the relation between the speed and firing angle of Universal motor.
PC-EE 594.6	construct any power electronics circuits as needed in operation.

Course Outcome of PC-EE 601	
After successful completion of the course PC-EE 601,students will be able to	
PC-EE 601.1	explain Power system components and their Representation
PC-EE 601.2	explain Load flow studies
PC-EE 601.3	describe Faults in Electrical systems and its types
PC-EE 601.4	analyze Power system stability problems
PC-EE 601.5	distinguish different types of Protective relays
PC-EE 601.6	classify different types Circuit breakers and different types of substations

Course Outcome of PC-EE 602	
After successful completion of the course PC-EE 602,students will be able to	
PC-EE 602.1	describethe architecture, different addressing modes, instruction set and assembler directives of 8086 microprocessor.
PC-EE 602.2	develop assembly language programs using software interrupts, subroutines, procedures, macros.
PC-EE 602.3	understand the design aspects of I/O and memory interfacing circuits.
PC-EE 602.4	illustrate how the different peripherals are interfaced with 8086 microprocessor.
PC-EE 602.5	associateof 8051 microcontroller & its architecture, programming & interfacing.
PC-EE 602.6	*compare* microprocessor, microcontroller, PIC and ARM processors.

Course Outcome of PE-EE 601A	
After successful completion of the course PE-EE 601A,students will be able to	
PE-EE 601A.1	To understand the basics of DC power transmssion system
PE-EE 601A.2	To analyse HVDC converters
PE-EE 601A.3	To understand methods of control of HVDC system
PE-EE 601A.4	To understand causes of fault and protection against fault of converters
PE-EE 601A.5	To understand function of smooting reactor and transient over voltage of DC line
PE-EE 601A.6	To understand methods of reactive power control

Course Outcome of PC-EE 602A	
After successful completion of the course PC-EE 602A,students will be able to	
PC-EE 602A.1	Compare the Impact of different transportation technologies on environment and energy supply.
PC-EE 602A.2	explain the basics of electric and hybrid electric vehicles, their architecture, technologies and fundamentals.
PC-EE 602A.3	analyze the use of different power electronics converters and electrical machines in hybrid electric vehicles

PC-EE 602A.4	interpret the working of different configurations of electric vehicles and its components, hybrid vehicle configurations
PC-EE 602A.5	choose proper energy storage systems for vehicle applications.
PC-EE 602A.6	implement different energy management strategies for hybrid vehicle.

Course Outcome of PC-EE 602B	
After successful completion of the course PC-EE 602B,students will be able to	
PC-EE 602B.1	discuss different types of tariff and different forms of Electric Power Generation and Electricity rules
PC-EE 602B.2	differentiate the various types of parameters of Overhead transmission line
PC-EE 602B.3	illustrate overhead line construction (sag, tension,corona, etc)
PC-EE 602B.4	explain different types of Insulators
PC-EE 602B.5	analyze Performance of lines
PC-EE 602B.6	compare different types of Cables along with their diffferent parameters

Course Outcome of OE-EE 601A	
After successful completion of the course OE-EE 601A,students will be able to	
OE-EE 601A.1	Determine the frequency response and the z-transform of discrete-time systems
OE-EE 601A.2	Determine the discrete Fourier transform of discrete-time signals
OE-EE 601A.3	Calculate the outputs of discrete-time systems in response to inputs.
OE-EE 601A.4	Determine the spectral coefficients and the Fourier series components of discrete-time signals
OE-EE 601A.5	Design Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) filters
OE-EE 601A.6	Demonstrate an understanding of contemporary issues by reviewing recent technical articles

Course Outcome of OE-EE 601B	
After successful completion of the course OE-EE 601B,students will be able to	
OE-EE 601B.1	To understand the AM, FM and PM schemes with reference to SNR
OE-EE 601B.2	To understand the performance of ASK, FSK, PSK, BPSK, QPSK in a digital communicationsystem
OE-EE 601B.3	To understand the source coding and channel coding schemes for a given communication link
OE-EE 601B.4	To understand the band width requirement and probability of error in various digital modulationsystems
OE-EE 601B.5	To understand various digital modulation methods
OE-EE 601B.6	To solve numerical problems on the topics studied

Course Outcome of HM-EE 601	
After successful completion of the course HM-EE 601,students will be able to	
HM-EE 601.1	understand the basic construction, operating principle and various characteristics of power electronics device
HM-EE 601.2	describe the working of phase controlled converter under different load conditions
HM-EE 601.3	evaluate different DC to DC converter with advanced design techniques
HM-EE 601.4	represent the basic idea with different types of inverter and their control strategy
HM-EE 601.5	compute various parameters of AC voltage controller and cycloconverter
HM-EE 601.6	differentiate between various FACTS device based on their application

Course Outcome of PC-EE 691

After successful completion of the course PC-EE 691,students will be able to

PC-EE 691.1	explain the characteristics of on delay relay and off delay relay.
PC-EE 691.2	determine the polarity, ratio and magnetization characteristics of CT and PT.
PC-EE 691.3	experiment on under voltage relay and over voltage relay.
PC-EE 691.4	determine AC load flow using Gauss-seidel method and Newton Raphson method.
PC-EE 691.5	explain Economic load dispatch.
PC-EE 691.6	determine characteristics of over current relay.

Course Outcome of PC-EE 692

After successful completion of the course PC-EE 692,students will be able to

PC-EE 692.1	explain the architecture of 8086 and 8051 and develop micro- processor/ microcontroller based systems.
PC-EE 692.2	demonstrate with 8086 microprocessor trainer kit and 8051 microcontroller tranier kit.
PC-EE 692.3	select proper mnemonics and programming strategies to run their program on the tranier kit.
PC-EE 692.4	program 8086 for arithmatic operation, sorting of array, searching for a number in a string and string manipulation.
PC-EE 692.5	practice to write 8051 ALLP using arithmatic, logical and bit manipulation instructions of 8051.
PC-EE 692.6	validate the interfacing technique like ADC/DAC, 8255, 8251 to 8086 and LCD, keyboard to 8051.

Course Outcome of PC-EE 681

After successful completion of the course PC-EE 681,students will be able to

PC-EE 681.1	develop a design calculation of a specified air core grounding reactor.
PC-EE 681.2	develop design calculation of substation
PC-EE 681.3	estimate of material for substation design
PC-EE 681.4	prepare a design calculation for specified 3-ph squirrel cage induction motor.
PC-EE 681.5	producea design calculation of capacitor start single phase induction motor
PC-EE 681.6	construct a design of controller for speed control of dc machine

Course Outcome of PC-EE 701

After successful completion of the course PC-EE 701,students will be able to

PC-EE 701.1	explain the principle of operation of Electric Drive.
PC-EE 701.2	describe different methods of starting and braking of Electric Drive.
PC-EE 701.3	model and control DC Drive
PC-EE 701.4	control speed of Induction and Synchronous motors.
PC-EE 701.5	recommend drives for different applications.
PC-EE 701.6	estimate ratings, variables and parameters of Electric Drives.

Course Outcome of PE-EE 701C

After successful completion of the course PE-EE 701C,students will be able to

PE-EE 701C.1	relate different types of power (thermal, hydro, nuclear)
PE-EE 701C.2	categorize different types of consumer, load, choice of generation unit
PE-EE 701C.3	illustrate tariff

PE-EE 701C.4	analyze unit commitment and calculate its problem
PE-EE 701C.5	explain economic load dispatch
PE-EE 701C.6	focus on state estimation and load forecasting

Course Outcome of OE-EE 701A	
After successful completion of the course OE-EE 701A,students will be able to	
OE-EE 701A.1	explain the concept of knowledge representation and predicate logic and transform the real lifeinformation in different representation
OE-EE 701A.2	describe state space and its searching strategies
OE-EE 701A.3	demonstrate profciency in applying scientifc method to models of machine learning
OE-EE 701A.4	apply the machine learning concepts in real life problems
OE-EE 701A.5	demonstrate an ability to share in discussions of AI, its current scope and limitations, and societalimplications
OE-EE 701A.6	observe the industrial application considering different drives system

Course Outcome of OE-EE 702A	
After successful completion of the course OE-EE 702A,students will be able to	
OE-EE 702A.1	Introductory knowledge of traction system and train movement
OE-EE 702A.2	Detailed analysis of electric traction motor and their operation
OE-EE 702A.3	Proficiency knowledge of traction motor control
OE-EE 702A.4	Proficiency knowledge of illumination and photometry
OE-EE 702A.5	Detailed analysis of electric heating and welding and their application
OE-EE 702A.6	Basic knowledge of electrolytic process with its application

Course Outcome of HM-EE 701	
After successful completion of the course HM-EE 701,students will be able to	
HM-EE 701.1	develop a design calculation of a specified air core grounding reactor.
HM-EE 701.2	develop design calculation of substation
HM-EE 701.3	estimate of material for substation design
HM-EE 701.4	prepare a design calculation for specified 3-ph squirrel cage induction motor.
HM-EE 701.5	producea design calculation of capacitor start single phase induction motor
HM-EE 701.6	construct a design of controller for speed control of dc machine

Course Outcome of PC-EE 791	
After successful completion of the course PC-EE 791,students will be able to	
PC-EE 791.1	examine the Speed Control of Chopper Fed DC motor drive and closed loop control.
PC-EE 791.2	illustrate PWM Inverter fed 3 phase Induction Motor control using PSPICE / MATLAB / PSIM Software.
PC-EE 791.3	focus on thysistor controlled DC motor drive.
PC-EE 791.4	generalize the study of TRIAC controlled AC single phase motor-speed control.
PC-EE 791.5	Validate of V/f control operation of 3Φ induction motor drive.
PC-EE 791.6	simulate of regenerative / dynamic braking operation for dc motor and ac motor.

Course Outcome of PW-EE 781	
After successful completion of the course PW-EE 781,students will be able to	
PW-EE 781.1	develop a design calculation of a specified air core grounding reactor.
PW-EE 781.2	develop design calculation of substation

PW-EE 781.3	estimate of material for substation design
PW-EE 781.4	prepare a design calculation for specified 3-ph squirrel cage induction motor.
PW-EE 781.5	producea design calculation of capacitor start single phase induction motor
PW-EE 781.6	construct a design of controller for speed control of dc machine

Course Outcome of PW-EE 782	
After successful completion of the course PW-EE 782,students will be able to	
PW-EE 782.1	examine the Speed Control of Chopper Fed DC motor drive and closed loop control.
PW-EE 782.2	illustrate PWM Inverter fed 3 phase Induction Motor control using PSPICE / MATLAB / PSIM Software.
PW-EE 782.3	focus on thysistor controlled DC motor drive.
PW-EE 782.4	generalize the study of TRIAC controlled AC single phase motor-speed control.
PW-EE 782.5	Validate of V/f control operation of 3Φ induction motor drive.
PW-EE 782.6	simulate of regenerative / dynamic braking operation for dc motor and ac motor.

Course Outcome of PC-EE 801	
After successful completion of the course PC-EE 801 ,students will be able to	
PC-EE 801.1	Introductory knowledge of traction system and train movement
PC-EE 801.2	Detailed analysis of electric traction motor and their operation
PC-EE 801.3	Proficiency knowledge of traction motor control
PC-EE 801.4	Proficiency knowledge of illumination and photometry
PC-EE 801.5	Detailed analysis of electric heating and welding and their application
PC-EE 801.6	Basic knowledge of electrolytic process with its application

Course Outcome of PE-EE 801A	
After successful completion of the course PE-EE 801A,students will be able to	
PE-EE 801A.1	Introductory knowledge of Line commutated converter
PE-EE 801A.2	Detailed analysis of line commutated converter and their operation
PE-EE 801A.3	Proficiency knowledge of pulse width modulation technique
PE-EE 801A.4	Proficiency knowledge of illumination and photometry
PE-EE 801A.5	Detailed analysis of pwm converter
PE-EE 801A.6	To describe the operation of multi level inverters with switching strategies

Course Outcome of OE-EE 801	
After successful completion of the course OE-EE 801,students will be able to	
OE-EE 801.1	understand the advantages of soft computing techniques
OE-EE 801.2	interpret the role of fuzzy logic in real life problems
OE-EE 801.3	explain the role of ANN in soft computing techniques
OE-EE 801.4	distinguish between GA with other soft computing techniques
OE-EE 801.5	deduce different models with GA
OE-EE 801.6	analyze the modern soft computing techniques

Course Outcome of PW-EE 881	
After successful completion of the course PW-EE 881,students will be able to	
PW-EE 881.1	collaborate as a team to achieve the project objectives
PW-EE 881.2	organize as an individual for sucesscessful completion of the team objective
PW-EE 881.3	relate the major and minor concepts with the selected dissertation field

PW-EE 881.4	collect all necessary supporting materials through literature review
PW-EE 881.5	Outline suitable and easy project execution steps
PW-EE 881.6	show imaginative and effectivein conveying ideas to the guide/audience.