

G PULLAIAH COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)

(Approved by AICTE | NAAC Accreditation with 'A' Grade |
Accredited by NBA (CIV, CSE, ECE & EEE) | Affiliated to JNTUA)
Nandikotkur Road, Venkayapalli (V), Kurnool - 518452, Andhra Pradesh

Course Name: FUNCTIONAL ENGLISH - A1001

A1001.1	Have improved communication in listening, speaking, reading and writing skills in general.
A1001.2	Have developed their oral communication and fluency in group discussions and interviews.
A1001.3	Have improved awareness of English in science and technology context.
A1001.4	Have achieved familiarity with a variety of technical reports.

Course Name: MATHEMATICS – I – A1002

A1002.1	The students become familiar with the application of differential and integral calculus, ordinary differential equations and vector calculus to engineering problems
A1002.2	The students attain the abilities to use mathematical knowledge to analyze, formulate and solve problems in engineering applications.

Course Name: COMPUTER PROGRAMMING - A1501

A1501.1	Apply problem solving techniques in designing the solutions for a wide-range of problems
A1501.2	Choose appropriate control structure depending on the problem to be solved
A1501.3	Modularize the problem and also solution

Course Name: ENGINEERING PHYSICS-A1003

A1003.1	The different realms of physics and their applications in both scientific and technological systems are achieved through the study of physical optics, lasers and fibre optics.
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A1003.2	The important properties of crystals like the presence of long-range order and periodicity, structure determination using X-ray diffraction are focused along with defects in crystals and ultrasonic non-destructive techniques.
A1003.3	The discrepancies between the classical estimates and laboratory observations of physical properties exhibited by materials would be lifted through the understanding of quantum picture of subatomic world.
A1003.4	The electronic and magnetic properties of materials were successfully explained by free electron theory and the bases for the band theory are focused.
A1003.5	The properties and device applications of semiconducting and magnetic materials are illustrated.
A1003.6	The importance of superconducting materials and nanomaterials along with their engineering applications are well elucidated.

Course Name : ENGINEERING DRAWING - A1301

A1301.1	Drawing 2D and 3D diagrams of various objects.
A1301.2	Learning conventions of Drawing, which is an Universal Language of Engineers
A1301.3	Drafting projections of points, planes and solids

Course Name: ENGLISH LANGUAGE COMMUNICATION SKILLS (ELCS) - A1006

A1006.1	Become active participants in the learning process and acquire proficiency in spoken English.
A1006.2	Speak with clarity and confidence thereby enhance employability skills

Course Name: ENGINEERING PHYSICS LABORATORY - A1007

A1007.1	Would recognize the important of optical phenomenon like Interference and diffraction.
A1007.2	Would have acquired the practical application knowledge of optical fiber, semiconductor, dielectric and magnetic materials, crystal structure and lasers by the study of their relative parameters.
A1007.3	Would recognize the significant importance of nano materials in various engineering fields.

Course Name: COMPUTER PROGRAMMING LAB - A1502

A1502.1	Apply problem solving techniques to find solutions to problems
A1502.2	Able to use C language features effectively and implement solutions using C language
A1502.3	Improve logical skills.

Course Name: MATHEMATICS – II- A1009

A1009.1	The student gains the knowledge to tackle the engineering problems using the concepts of Fourier series, various transforms and partial differential equations
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Course Name: ENGLISH FOR PROFESSIONAL COMMUNICATION- A1008

A1008.1	Have acquired ability to participate effectively in group discussions.
A1008.2	Have developed ability in writing in various contexts.
A1008.3	Have acquired a proper level of competence for employability

Course Name: ENGINEERING CHEMISTRY- A1004

A1004.1	Differentiate between hard and soft water. Understand the disadvantages of using hard water domestically and industrially. Select and apply suitable treatments domestically and industrially.
A1004.2	Understand the electrochemical sources of energy
A1004.3	Understand industrially based polymers, various engineering materials

Course Name: ENVIRONMENTAL STUDIES - A1005

A1005.1	Students will get the sufficient information that will clarify modern environmental concepts like equitable use of natural resources, more sustainable life styles etc.
A1005.2	Students will realize the need to change their approach so as to perceive our own environmental issues correctly, using practical approach based on observation and self learning.
A1005.3	Students become conversant with the fact that there is a need to create a concern for our environment that will trigger pro-environmental action; including simple activities we can do in our daily life to protect it.

A1005.4	By studying environmental sciences, students is exposed to the environment that enables one to find out solution of various environmental problems encountered on andoften.
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Course Name: ELECTRICAL CIRCUITS - I - A1203

A1203.1	Given a network, find the equivalent impedance by using network reduction techniques
A1203.2	Given a circuit and the excitation, determine the real power, reactive power, power factoretc.,.
A1203.3	Determine the current through any element and voltage across anyelement
A1203.4	Apply the network theorems suitably

Course Name: ENGINEERING CHEMISTRY LAB - A1010

A1010.1	Would be confident in handling energy storage systems and would be able combat chemicalcorrosion
A1010.2	Would have acquired the practical skill to handle the analytical methods with confidence.
A1010.3	Would feel comfortable to think of design materials with the requisiteproperties
A1010.4	Would be in a position to technically address the water relatedproblems.

Course Name: ELECTRICAL CIRCUITS LAB -A1204

A1204.1	Apply suitable theorems for circuit analysis and verify the resultstheoretically
A1204.2	Experimental determination of two port network parameters and theoretical verification
A1204.3	Measure active and reactive power experimentally and verify the theoreticalvalues
A1204.4	Experimentally determine self inductance, mutual inductance and coefficient

	of coupling
A1204.5	Practically determine band width, Q-factor and verify with theoretical values.

Course Name: ENGINEERING & I.T. WORKSHOP- A1302

A1302.1	Disassemble and Assemble a Personal Computer and prepare the computer ready to use.
A1302.2	Prepare the Documents using Wordprocessors
A1302.3	Prepare Slide presentations using the presentation tool
A1302.4	Interconnect two or more computers for informationsharing
A1302.5	Access the Internet and Browse it to obtain the required information

Course Name: Linear Algebra and Complex Variables -A1014

A1014.1	Demonstrate knowledge of matrix calculation as an elegant and powerful mathematical language in connection with rank of a matrix, linear system of equations, linear dependence and independence
A1014.2	Interpret the Eigen values and Eigen vectors of matrix in terms of the transformation it represents in to a matrix Eigen value problem.
A1014.3	Define a quadratic form and determine its nature using Eigen values. Apply Beta and Gamma functions to evaluate many integrals which cannot be expressed in terms of elementary functions.
A1014.4	Analyze the functions of complex variable which include continuity, differentiability and analyticity along with evaluation of Cauchy-Riemann equations in Cartesian and polar coordinates.
A1014.5	Employ the Cauchy's integral theorem along with integral formula along with expansion in Taylor's series, Maclaurin's series and Laurent series.
A1014.6	Evaluate the residual formula through Laurent series and residue theorem along with evaluation of improper real integrals.

Course Name: ELECTRICAL MACHINES-I- A1205

A1015.1	Calculate the e.m.f. generated on open circuit, terminal voltage on load and
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	load shared by each generator.
A1015.2	Determine the gross torque and useful torque developed by DC motor and Identify suitable methods to control speed of DC motors.
A1015.3	Calculate the losses and efficiency of DC generators and motors.
A1015.4	Conduct O.C, S.C tests and predetermine the regulation, efficiency and draw the equivalent circuit of transformer.
A1015.5	Compute the load shared by each transformer when several transformers operate in parallel.
A1015.6	Construct and operating characteristics of three phase induction motors, and various tests are conducted to construct the circle diagram to determine the performance of induction motors.

Course Name: ELECTRO MAGNETIC FIELDS-A1206

A1206.1	Understand the behavior of static magnetic fields in standard configurations by applying vector calculus.
A1206.2	Apply vector calculus to generalize the behavior of static electric fields in standard configurations.
A1206.3	Analyze the inductance and capacitance for different structures.
A1206.4	Apply basic laws of electric, magnetic and electromagnetic fields to find force.
A1206.5	Analyze the effect of time varying fields involving both electric and magnetic field on a wave propagating through a medium along analysis of with modified Maxwell's equations for time varying fields.
A1206.6	Use of modern tool MATLAB to simulate electromagnetic fields of transmission lines.

Course Name: ELECTRICAL CIRCUITS – II –A1207

A1207.1	Analyze three phase balanced and unbalanced circuits and determine line voltages, line currents, phase voltages and phase currents
A1207.2	Measure active and reactive power consumed by a given three phase circuit
A1207.3	Determine the transient response of R-L, R-C, R-L-C circuits for D.C and A.C Excitations
A1207.4	Apply Fourier transforms to electrical circuits excited by non-sinusoidal sources
A1207.5	Design different types of filters.

Course Name: ELECTRONIC DEVICES AND CIRCUITS –A1401

A1401.1	Understand the operation and characteristics of PN diode with diode's applications in electronic circuits.
A1401.2	Formulate the electrical models for special semiconductor diodes like Tunnel diode, LED and Photodiode.
A1401.3	Analyze various rectifiers and filter circuits used in regulated power supplies.
A1401.4	Compare and contrast the construction, working principles, characteristics and applications of major electronic devices like BJT, FET and MOSFET.
A1401.5	Design and analyze the DC bias circuitry of BJT.
A1401.6	Design and analyze the small signal models of BJT & FET Amplifiers at low frequencies.

Course Name: ELECTRICAL MACHINES-I LAB –A1208

A1208.1	Understand the concept of OP-AMP such as differential amplifier modes analysis using r parameters, ideal OP-AMP parameter fundamentals and various stages in the OP-AMP.
A1208.2	Depict the internal block diagram of operational amplifiers along with listing out some typical applications of operational amplifiers in linear and non linear modes of operation
A1208.3	Analyze various applications of Op-Amp and also to design and construct waveform generation circuits.
A1208.4	Study the block diagram of 555 timer and 565 phase locked loops ICs and employ them to construct various applications along with listing out different CMOS logic families.
A1208.5	Differentiate between CMOS and TTL logic families; realize various logic functions using VHDL code for CMOS logic.
A1208.6	Interpret various combinational and sequential logic circuits and simulate it by using VHDL code.

Course Name: ELECTRICAL CIRCUITS AND SIMULATION LAB- A1209

A1209.1	Explain electric circuit concepts by interpreting the simulation results
A1209.2	Design RLC series circuit for specified frequency response
A1209.3	Analyze three phase balanced and unbalanced circuits
A1209.4	Design RL, RC and RLC circuits for specified transient response
A1209.5	Design and Frequency Response of Low Pass and High Pass

Course Name: ELECTRONIC DEVICES AND CIRCUITS LABORATORY-A1405

A1405.1	Analyze the description of CRO and Function generator panels.
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A1405.2	Find the cut-in voltage, static and dynamic resistances from V-I characteristics of PN junction diode.
A1405.3	Find the breakdown voltage and Regulation characteristics of Zener diode.
A1405.4	Compute the ripple content present in half wave and full wave rectifiers with and without filters.
A1405.5	Plot the characteristics of BJT and FET.
A1405.6	Draw the frequency response of single stage amplifiers at low, mid and high frequencies.

Course Name: ELECTRICAL MACHINES-II –A1210

A1210.1	Identify the three phase transformers employed in distribution and transmission system based on their connections.
A1210.2	Understand the construction and principle of operation of round rotor and salient pole machines along with E.M.F Equation.
A1210.3	Determine experimentally the characteristics of synchronous generator along with phasor diagram and also evaluate the regulation by synchronous impedance method, M.M.F method and Z.P.F method
A1210.4	Interpret the parallel operation of synchronous generators and determination of sub-transient, transient and steady state reactance's
A1210.5	Explain the principle of operation of synchronous motor along with V and Inverted V curves and also describe the concept of hunting and methods of starting in synchronous induction motor
A1210.6	Infer the constructional features of single phase motor along with double revolving field theory and elementary idea of cross-field theory. Carry out a detailed analysis on special motors which include A.C series motor, universal motor and stepper motor.

Course Name : CONTROL SYSTEMS –A1211

A1211.1	Differentiate the open loop and closed loop control system along with understanding of fundamental concepts like signal flow graph and Mason's gain formula and also representing the transfer function of AC and DC servomotor.
A1211.2	Analyze the time response of both first order and second order systems along with the designing of various controllers
A1211.3	Apply the concepts of stability through Root locus technique, R-H Criterion in s-Domain
A1211.4	Plot the phase and magnitude of various systems employing Bode plot, Nyquist plot and polar plot
A1211.5	Design compensation techniques which involve lag, lead and lead-lag type.
A1211.6	Derive the State models from schematic models along with diagonalization and formulation of state transition matrix

Course Name: POWER SYSTEMS – I –A1212

A1212.1	Recognize the importance of power generation and difference between renewable and non-renewable energy sources, recall the process of nuclear fission and chain reaction.
A1212.2	Analyze the construction, working and operating principle, and essential components of various power generating stations with their relative merits and demerits.
A1212.3	Design the layout and select the optimal location for different power plants along with its relevant features.
A1212.4	Analyze the different methods and characteristics of solar, wind, biogas, geothermal and ocean power generating systems along with their economic and environmental aspects.
A1212.5	Carry out a detailed analysis on the economic aspects of power generation involving various tariff methods and costs of generation.

Course Name: LINEAR AND DIGITAL INTEGRATED CIRCUIT APPLICATIONS- A1414

A1414.1	Understand the internal operation of Op-Amp and its specifications.
A1414.2	Operate 555 timer in different modes like monostable and astable operations and study their applications and discuss about various DAC and ADC techniques
A1414.3	Analyze and design applications like filters using Op-Amp and discuss about oscillators.
A1414.4	Apply basic switching concepts for realizing logic circuits.
A1414.5	Analyze and design combinational and sequential circuits.
A1414.6	Write VHDL code for any type of logic circuit.

Course Name: CONTROL SYSTEMS AND SIMULATION LAB –A1213

A1213.1	Design the controllers/compensators to achieve desired specifications.
A1213.2	Understand the effect of location of poles and zeros on transient and steady state behavior of systems.
A1213.3	Assess the performance, in terms of time domain specifications, of first and second order systems.
A1213.4	Understand the concepts of PLC and develop the PLC programs
A1213.5	Use MATLAB/SIMULINK software for control system analysis and design.

Course Name: ELECTRICAL MACHINES-II LAB –A1214

A1214.1	Conduct suitable tests on single phase transformer and pre determine the efficiency and regulation at different loading conditions.
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A1214.2	Perform the regulation of alternator by EMF and MMF methods in order to evaluate voltage regulation at different power factors.
A1214.3	Carry out No load and blocked rotor tests on three phase induction motor to determine efficiency and also to draw the performance characteristics.
A1214.4	Analyze the equivalent circuit diagrams of single phase induction motor by conducting various tests.
A1214.5	Conduct the brake test on 3 phase induction motors and evaluate the performance characteristics
A1214.6	Convert 3 phase to 2 phase connection in 3 phase transformer through Scott Connection

Course Name: LINEAR AND DIGITAL INTEGRATED CIRCUIT APPLICATIONS LAB-A1415

A1415.1	Study the closed-loop Op-amp configurations.
A1415.2	Generate sinusoidal, triangular & square waveform using op-amp.
A1415.3	Design and verify the frequency response of the filters using TL082 Op Amp.
A1415.4	Design and draw the internal structure of various logic gates.
A1415.5	Implement Combinational circuits using VHDL source code.
A1415.6	Develop VHDL source code and perform simulation.

Course Name: POWER SYSTEMS-II -- A1218

A1218.1	Apply the knowledge of electromagnetic fields to calculate the parameters of transmission lines and underground cables.
A1218.2	Analyze the performance of various transmission lines, underground cables and overhead insulators.
A1218.3	Design mechanical transmission lines using corona phenomenon, Sag and Tension.
A1218.4	Analyze the distribution system, types of faults and protective devices

Course Name: POWER ELECTRONICS – A1219

A1219.1	Illustrate the fundamental concepts and techniques used in power electronic circuits.
A1219.2	Analyze the performance and protection techniques of power electronic devices.
A1219.3	Analyze the operation and performance of AC-DC, DC-DC, DC-AC and AC-

	AC converters.
A1219.4	Design a suitable power electronic converter circuit for given applications.
A1219.5	Apply PWM techniques to improve the performance of DC-DC and DC-AC converters.

Course Name: ELECTRICAL MEASUREMENTS AND INSTRUMENTATION - A1220

A1220.1	Categorize various electrical instruments used for measuring electrical parameters.
A1220.2	Analyze the errors and compensations in various electrical measuring instruments
A1220.3	Measure current, voltage, power and energy in 1-phase and 3-phase circuits.
A1220.4	Estimate the unknown quantities of resistance, inductance and capacitance using bridges
A1220.5	Apply transducers, digital meters and CRO for measuring electrical parameters

Course Name: DIGITAL ELECTRONICS - A1424

A1424.1	Perform arithmetic operations on different number systems and to apply the principles of Boolean algebra to minimize logic expressions.
A1424.2	Make use of k map and tabulation methods to minimize boolean functions and to implement with logic gates.
A1424.3	Analyze basic components used in digital systems such as adder and subtractor, decoder, encoder, multiplexer, flip-flops, registers and counters
A1424.4	Distinguish combinational and sequential logic in terms of their functions.
A1424.5	Design various PLDs such as ROMs, PALs, PLAs and PROMs.

Course Name: POWER ELECTRONICS LABORATORY - A1221

A1221.1	Analyze the performance characteristics of SCR firing and commutation circuits.
A1221.2	Plot the performance characteristics of AC-DC, DC-AC, DC-DC and AC-AC converters with R and RL Loads.
A1221.3	Apply the knowledge of MATLAB to plot the characteristics of full converter, inverter and forced commutation circuits

**Course Name: ELECTRICAL MEASUREMENTS AND INSTRUMENTATION
LABORATORY - A1222**

A1222.1	Estimate resistance, inductance and capacitance of electrical circuits using bridges and dielectric strength of transformer oil
A1222.2	Calculate the percentage error of various measuring instruments, LVDT, and resistance strain gauge
A1222.3	Evaluate 3- Φ active power and reactive power of different loads.
A1222.4	Calibrate single phase energy meter and DC Crompton potentiometer.

**Course Name: ADVANCED ENGLISH LANGUAGE COMMUNICATION SKILLS-
A1016**

A1016.1	Build inferences and predictions based on the information provided in the context.
A1016.2	Choose academic vocabulary appropriately both in speaking and in writing.
A1016.3	Develop effective technical writing skills.
A1016.4	Construct necessary skills to deliver presentation confidently for improving in respective domains
A1016.5	Apply language structures to construct good relations.

Course Name: POWER SEMICONDUCTOR DRIVES - A1223

A1223.1	Identify a suitable electric drive system for desired application.
A1223.2	Apply 1-phase & 3- phase controlled converters for speed control operation of DC drives.
A1223.3	Apply the knowledge of DC-DC Converter and dual converter for speed and torque control of DC Drives.
A1223.4	Apply the knowledge of AC voltage controller and cyclo-converter to control the speed of an induction motor and synchronous motor.

Course Name: POWER SYSTEM ANALYSIS - A1224

A1224.1	Apply computational methods to determine transmission line parameters.
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A1224.2	Apply load flow methods to examine the load flow studies.
A1224.3	Analyze symmetrical and unsymmetrical power system faults.
A1224.4	Apply the methods to improve the steady state and transient stability of power systems.

Course Name: MICROPROCESSORS AND MICROCONTROLLERS - A1427

A1427.1	Analyze 8086 microprocessor and MSP430 microcontroller architectures
A1427.2	Develop programs using 8086 microprocessor and MSP430 microcontroller
A1427.3	Make use of peripherals of MSP430 to interface I/O devices
A1427.4	Apply serial communication protocols for interfacing serial devices.
A1427.5	Design embedded applications using MSP430 microcontroller

Course Name: POWER SYSTEMS SIMULATION LABORATORY - A1230

A1230.1	Develop a program to simulate Ferranti effect
A1230.2	Develop a program to model transmission lines
A1230.3	Develop a program for formation Y-Bus and Z-Bus
A1230.4	Develop a program for load flow solution
A1230.5	Develop a program for short circuit analysis
A1230.6	Develop a Simulink model for evaluating transient stability

Course Name: MICROPROCESSORS AND MICROCONTROLLERS LABORATORY- A1429

A1429.1	Develop assembly language programs using EMU8086 emulator.
A1429.2	Execute 8086 ALPs for arithmetic, logical, string, call operations.
A1429.3	Build programs of MSP430 using embedded C.
A1429.4	Interface LEDs push buttons, potentiometer to MSP430.
A1429.5	Test and debug 8086 ALPs and MSP430 embedded C programs

Course Name: PYTHON PROGRAMMING LABORATORY – A1529

A1529.1	Apply fundamental programming concepts of python for solving general purpose problems
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A1529.2	Implement sequences to solve complex problems
A1529.3	Build functions to increase code reusability
A1529.4	Implement modular programming for organized software development
A1529.5	Make use of exception handling for robust programming.

Course Name: HUMAN VALUES & PROFESSIONAL ETHICS - A1015

A1015.1	Apply human values and ethics in professional life.
A1015.2	Develop the moral ideals to maintain good relationships with people.
A1015.3	Solve environmental related problems by keeping health of human being into consideration.
A1015.4	Make use of the fundamental rights and human rights in life for individual dignity.
A1015.5	Build the sound health system both physically and mentally by practicing yoga, karate, sports etc

Course Name: SPECIAL ELECTRICAL MACHINES - A1251

A1251.1	Analyze the performance of switched reluctance motors, stepper motors, permanent magnet dc motors linear motors and servo motors
A1251.2	Deduce the emf and torque equations of stepper motor, servo motor, reluctance motor and BLDC motor.
A1251.3	Apply speed control techniques for switched reluctance motors, stepper motors, Permanent magnet dc motors linear motors and servo motors.
A1251.4	Plot the characteristics of switched reluctance motors, stepper motors, Permanent magnet dc motors linear motors and servo motors.

Course Name: UTILISATION OF ELECTRICAL ENERGY - A1252

A1252.1	Analyze various illumination systems, heating and welding techniques.
A1252.2	Analyze the torque- speed characteristics, speed-time characteristics and specific energy consumption of electric locomotive
A1252.3	Apply suitable braking technique to control the speed locomotive.
A1252.4	Apply the power factor improvement and load factor improvement techniques

	for effective usage of electrical energy.
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Course Name: ADVANCED CONTROL THEORY - A1253

A1253.1	Develop the mathematical model of linear/non-linear systems in state space.
A1253.2	Investigate the controllability/observability of a given system.
A1253.3	Analyze stability of linear / Non-linear systems using various methods.
A1253.4	Design state feedback controller and optimal controller for a given system.
A1253.5	Evaluate the stability of the given system by Lyapunov criterion.
A1253.1	Develop the mathematical model of linear/non-linear systems in state space.

Course Name: SOLAR ENERGY AND ITS APPLICATIONS - A1254

A1254.1	Demonstrate the usage of solar energy for different electrical equipment's.
A1254.2	Apply the principles of solar radiation to generate electrical energy.
A1254.3	Analyze the thermal properties of solar energy collectors.
A1254.4	Classify the methods to measure solar radiation and store solar energy.
A1254.5	Analyze the economic aspects and environmental issues related to solar system.

Course Name :ELECTRICAL AND HYBRID VEHICLES - A1255

A1255.1	Analyze the topologies used for design of hybrid electric vehicles.
A1255.2	Apply the concepts of power electronics & drives to control hybrid electric vehicles
A1255.3	Analyze power flow control and various energy storage components used for hybrid electric vehicles
A1255.4	Demonstrate different configurations, techniques and sizing of components used in hybrid electric vehicles
A1255.5	Apply the Various energy management strategies in hybrid electric vehicles.

Course Name: ELECTRICAL DISTRIBUTION AND AUTOMATION - A1256

A1256.1	Categorize the different types of distribution system, feeders and loads.
A1256.2	Compare the voltage drop and power loss for various distribution systems.
A1256.3	Design a substation layout with optimal location.
A1256.4	Analyze the methods for power factor correction.
A1256.5	Apply the knowledge of Distribution automation and SCADA in Energy management systems operations.

Course Name:FUNDAMENTALS OF SIGNALS AND SYSTEMS - A1257

A1257.1	Distinguish between different signals and systems.
A1257.2	Make use of Fourier series for the representation of signals.
A1257.3	Analyze different signals by using an appropriate transform.
A1257.4	Select an appropriate transform to find the transfer function of the system.
A1257.5	Analyze the system stability in different domains.

Course Name:WIND ENERGY AND ITS APPLICATIONS - A1258

A1258.1	Apply various measurement techniques to determine the atmospheric and design boundaries of wind turbines.
A1258.2	Apply a suitable turbine model to generate electrical energy from wind energy.
A1258.3	Analyze the parameters of aerodynamics, DRC/PMG Generator and AC drive connected wind turbines.
A1258.4	Apply suitable control and monitoring mechanism for wind energy systems.

Course Name:MACHINE MODELING AND ANALYSIS - A1259

A1259.1	Apply the principles of electrical machines in their design and modelling.
A1259.2	Evaluate the Voltage and Torque Equation of DC and AC Machines.
A1259.3	Differentiate the performance of machines using reference frame theory.
A1259.4	Analyze the dynamic modelling and steady state behavior of various electrical Machines.

Course Name:HIGH VOLTAGE ENGINEERING - A1260

A1260.1	Analyze the breakdown mechanisms of solids liquids and gases.
A1260.2	Design the insulation for power system components.
A1260.3	Analyze and calculate the circuit parameters involved in generation of high voltages.
A1260.4	Measure the alternating signals, impulse high voltage signals, dielectric loss and partial discharge.

Course Name: DIGITAL CONTROL SYSTEMS - A1261

A1261.1	Apply the Sampling and reconstruction theory in A/ D & D/A Conversion.
A1261.2	Solve the given differential equations using Z- transforms.
A1261.3	Analyze the given discrete time system in frequency domain and Z domain.
A1261.4	Design a given discrete time system in Z – Plane and state space representation.
A1261.5	Investigate the Stability of the closed loop systems using Z- transforms.

Course Name: SMART GRID TECHNOLOGY-A1262

A1262.1	Demonstrate the need of converting conventional grid to Smart Grid.
A1262.2	Assess the role of automation in Transmission and Distribution.
A1262.3	Apply Evolutionary Algorithms for the Smart Grid.
A1262.4	Analyze various Methods used for information security on smart grid
A1262.5	Analyze Voltage and Frequency control techniques in Micro Grids.

Course Name: FUNDAMENTALS OF ELECTRICAL ENGINEERING - A1281

A1281.1	Apply network reduction techniques and knowledge of alternating quantities to calculate current, voltage and power for complex circuits.
A1281.2	Analyze the electrical circuits using nodal analysis, mesh analysis and network theorems.
A1281.3	Demonstrate the working principle and operation of DC machines, AC machines and single-phase transformers.
A1281.4	Test the Performance of DC machines, AC machines and single-phase transformers.

Course Name:RENEWABLE ENERGY SOURCES - A1282

A1282.1	Apply the principles of Renewable energy sources for the construction of Power generating station.
A1282.2	Analyze the various energy conversion systems and their limitations.
A1282.3	Analyze Renewable energy sources for various environmental conditions
A1282.4	Analyze the generation principles and operation of variety of sources of energy

Course Name:ELECTRICAL MEASURING INSTRUMENTS - A1283

A1283.1	Categorize various electrical instruments used for measuring electrical parameters.
A1283.2	Design appropriate arrangement for extension of range in measuring instruments.
A1283.3	Analyze the errors and compensations in various electrical measuring instruments
A1283.4	Measure current, voltage, power and energy in 1-phase and 3-phase circuits.
A1283.5	Estimate the unknown quantities of resistance, inductance and capacitance using bridges