Koneru Lakshmaiah Education Foundation
(Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)
Accredited by NAAC as 'A++' ❖Approved by AICTE ❖ ISO 9001-2015 Certified
Campus: Green Fields, Vaddeswaram - 522 302, Guntur District, Andhra Pradesh, INDIA.
Phone No. 08645 - 350200; www.klef.ac.in; www.klef.edu.in; www.kluniversity.in
Admin Off: 29-36-38, Museum Road, Governorpet, Vijayawada - 520 002. Ph: +91 - 866 - 3500122, 2577715, 2576129.

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

2019 B.Tech Admitted batch

Course Code	Course Title	CO NO	Description of the Course Outcome
HUMANITIES & SOCIAL SCIENCES			
19UC1101	BASIC ENGLISH	CO1	Apply the practical knowledge of using action words in sentence construction.
		CO2	Apply and analyse the right kind of pronunciation with regards to speech sounds and able to get different types of pronunciations.
		CO3	Apply the concept of fundamental principle of counting to solve the problems on linear, circular permutations and also for the problems on selections. Apply the concept of probability, while doing the problems on Leap year & Non-Leap year problems, coins, dice, balls and cards.
		CO4	Analyze the given conditions and finding out all the possible arrangements in linear & circular order. Analyze the given numbers or letters to find out the hidden analogy and apply that analogy to find solutions. Finding the odd man out by observing the principle which makes the others similar.
19UC1202	ENGLISH PROFICIENCY	CO1	Apply the concepts of accurate English while writing and become equally at ease in using good vocabulary and language skills.
		CO2	Understand the importance of pronunciation and apply the same day to day conversation.
		CO3	Apply the concepts of ratios, percentages, averages and analyze the given information on the basis of comparative analysis of the data in the form of tabulation, bar graphs, pie charts, line graphs.
		CO4	Apply the basic functionality of clocks and calendars to find the solutions for the problems. Analyze the given symbols to understand the hidden meaning of the given expression and find the solutions. Analyze the possible arrangements in linear & circular order.
19UC2103	PROFESSIONAL COMMUNICATION SKILLS	CO1	Able to spot the common grammatical errors related to sentence structure, preposition, concord, relative and conditional clauses and parallel structures. The learner should be efficient to construct a context-determined text in addition to learning Technical Writing Skills.

		CO2	Able to read, understand, and interpret a text intrinsically as well as extrinsically. The learner can browse a text quickly to come-up with a gist and personal interpretation. Able to create a healthy work-environment and prove to be an asset or one of the most reliable resources to the organization.
		CO3	Apply the concepts of time and work; men-time-work problems based on wages, pipes and cisterns. Apply the concepts of time and distance and solve the problems related to average speed, relative speed.
		CO4	Apply Venn diagrams to find out appropriate conclusions from the given statements. Apply the logical implications and also the negations of various connectives to find the solutions. Analyze the data and represent in the form of Venn diagrams to find relations between any given set of elements.
19UC2204	APTITUDE BUILDER -1	CO1	Apply the concept of Critical Reading and Analytical Reading and comprehend the keyideas and gist of a passage.Understand the importance of the presentation skills, analyze the given topic, apply various strategies and the principles of grammar in written expression.
		CO2	Apply the concepts of grammar, various strategies and the usage of formal language in written expression. By using synonyms rewrite the same text in the same format and meaning. Write the gist of the given text.
		CO3	Apply the concepts of Numbers to solve the problems related to divisibility rules, problems based on Unit's digit, Remainders, Successive Division, Prime Factorization, LCM & HCF problems. Apply the concepts of Averages &Alligations, students will be able to solve the problems related to Averages as well as problems based on Mixtures.
		CO4	Apply the various concepts of cubes to find out how to cut a cube to get the maximum number of smaller identical pieces, how to minimize the number of cuts required to cut a cube into the given number of smaller identical pieces, how to count the number of smaller cubes which satisfy the given painting scheme. Apply the principles of binary logic to solve problems involving truth-tellers, liars and alternators. Analyze the given data to form an ordered arrangement from an unorganized raw data.
19UC3105	APTITUDE BUILDER - 2	CO1	Apply the strategies and techniques learnt in carrying out conversations in different contexts. Analyse the different parameters and formats of written technical communication and apply in everyday work and life.
		CO2	Analyse the concepts of critical and analytical reading skills. Apply the strategies and techniques learnt in handling interviews in different contexts.

		CO3	Apply the concepts of Ratio & Proportion, Percentages, Profit &Loss, Simple & Compound Interest, students will be able to solve the problems based on Ratios, problems involving Percentages, problems related to cost price, selling price, profit, loss, marked price and discounts, problems involving interest.
		CO4	Analyze the given series of numbers to predict the next number in the series. Analyze the given set of numbers or letters to find the analogy. Analyze the given data to find the code which is used to encode a given word and use the same code in the process of decoding. Apply the given set of conditions to select a team from a group of members.
19UC0007	*INDIAN HERITAGE AND CULTURE	CO1	To familiarize with various aspects of the culture and heritage of India through ages.
		CO2	To acquaint with the contributions of Indians in the areas of languages and literature, religion and philosophy
		CO3	To understand the Social structure and the spread of Indian culture abroad
		CO4	To know the development of Science and Technology in India through ages and to appreciate the contributions of some of the great Indian scientists
19UC0008	*INDIAN CONSTITUTION	CO1	To understand Constitutional development after Independence
		CO2	To learn the fundamental features of the Indian Constitution
		CO3	To get a brief idea of the powers and functions of Union and State Governments
		CO4	To understand the basics of working of Indian Judiciary and the Election Commission
19UC0009	*ECOLOGY AND ENVIRONMENT	CO1	Understand the importance of Environmental education and conservation of natural resources.
		CO2	Understand the importance of ecosystems and biodiversity
		CO3	Apply the environmental science knowledge on solid waste management, disaster management and EIA process
		CO4	Understand the importance of Environmental education and conservation of natural resources
19UC0010	*UNIVERSAL HUMAN VALUES & PROFESSIONAL ETHICS	CO1	Understand and identify the basic aspiration of human beings
		CO2	Envisage the roadmap to fulfill the basic aspiration of human beings.
		CO3	Analyze the profession and his role in this existence.
19UC0011	*ENTREPRENEURSHIP	CO1	Analyze the business environment in order to identify business opportunities,
		CO2	Identify the elements of success of entrepreneurial ventures
		CO3	Consider the legal and financial conditions for starting a business venture
		CO4	Evaluate the effectiveness of different entrepreneurial strategies
Note: * marked course are audit courses			
BASIC SCIENCES			

19MT1101	MATHEMATICS FOR COMPUTING	CO1	Understand the basic Structures, relations and permutations & combinations, probability
		CO2	Model and solve the relevant physical problems mathematically as a system of linear equations.
		CO3	Apply the rules of Propositional logic to establish valid results of mathematical arguments, Induction and solve recurrence relations.
		CO4	Understand the graphs and analyze different problems associated with computer, logic design.
		CO5	Describe the Aptitude & Reasoning skills
19MT2102	MATHEMATICS FOR ENGINEERS	CO1	Apply differential and integral calculus to find maxima & minima of functions and evaluate the integrals
		CO2	Model and solve the relevant phenomena as a differential equation.
		CO3	Demonstrate Fourier series and Analytic functions
		CO4	Describe probability , Random Variables and Algebraic structures
19BT1001	BIOLOGY FOR ENGINEERS	CO1	Acquire the Knowledge of basic biology
		CO2	Acquire the Knowledge of Human Biological Systems
		CO3	Acquire Knowledge on Microorganisms and Biosensors
SCIENCE ELECTIVE-1			
19PH1006	MATERIALS AND MEASUREMENTS	CO1	Understand the basic lattice structure and bondings in materials.
		CO2	Acquire the knowledge on the electrical properties of conductors and semiconductors.
		CO3	Understand the materials used in the MEMS technology and the fabrication process.
		CO4	Acquire the knowledge on generalized measurement system and able to select the suitable transducer for measurement applications.
		CO5	Apply the skill of using meters for the measurement process.
SCIENCE ELECTIVE-2			
19CY1101	ENGINEERING CHEMISTRY	CO1	Demonstrate different types of semiconducting materials
		CO2	llustrate photophysical basis of light absorption and emission by materials
		CO3	Sketch the underlying principles of organic light emitting diodes
		CO4	Explain the concepts of solar cells modules and memory devices
		CO5	An ability to apply and generate experimental skills
SCIENCE ELECTIVE-3			
19EE2101	ELECTRICAL CIRCUITS	CO1	Analyze transient behavior of DC & AC circuits and Two port networks.
		CO2	Analyze the single and three phase AC circuits.

		CO3	Understand the concepts of magnetic circuits and Frequency response
			in electrical circuits.
		CO4	Understand the concepts of network topology and two port networks.
		CO5	Test the Electrical networks of AC & DC
ENGINEERING SCIENCES			
19SC1101	PROBLEM SOLVING AND COMPUTER PROGRAMMING	CO1	Illustrate how problems are solved using computers and programming.
		CO2	Illustrate and use Control Flow Statements in C.
		CO3	Interpret & Illustrate user defined C functions and different operations on list of data.
		CO4	Implement Linear Data Structures and compare them.
		CO5	Apply the knowledge obtained by the course to solve real world problems.
19ME1103	DESIGN TOOLS WORKSHOP -I	CO1	Practice design thinking by developing artistic skills, Visualize and complete his/her innovative design by final drafting using 3D modeling
		CO2	Understand the concept of web page, web browser, web server, and able to create Static webpages
		CO3	Understand the concept of report writing using a markup language Latex
		CO4	Understand the concept of data visualization and creating data visualization dashboards, Understand the basic concept of VR/AR.
19SC1202	DATA STRUCTURES	CO1	Apply measures of efficiency on algorithms and Analyse different Sorting Algorithms.
		CO2	Analyse and compare stack ADT and queue ADT implementations using linked list and applications.
		CO3	Analyse the linked implementation of Binary, Balanced Trees and different Hashing techniques.
		CO4	Analyse different representations, traversals, applications of Graphs and Heap organization.
		CO5	Develop and Evaluate common practical applications for linear and non-linear data structures.
19SC1209	DESIGN TOOLS WORKSHOP -II	CO1	Practice the design ideology by artistic skill
		CO2	Visualize the design ideology by using VR technology
		CO3	Visualize the design ideology by incorporating VR technique
		CO4	Visualize and present his design idea by applying AR technique
19SC1203	OBJECT ORIENTED PROGRAMMING	CO1	Understand basic Concepts of OOP, fundamentals of java and apply the concepts of classes and objects through Java Language. Apply constructors, Overloading, parameter passing.
		CO2	Apply access control, Inheritance, Packages.
		CO3	Apply Interfaces, Exception Handling, multi- threading, I/o
		CO4	Apply collection framework and event driven programming.

			Apply object-oriented programming concepts to write programs and Analyses requirements and design to implement lab-based project with SDLC in a group of students.
19EC1101	DIGITAL LOGIC & PROCESSORS	CO1	Understand numerical and character representations in digital logic, number system, data codes and the corresponding 8design of arithmetic circuitry. Understanding Logic gates, Logic theorems, Boolean algebra and SOP/POS expressions.
		CO2	Combinational systems design using standard gates and minimization methods
		CO3	Sequential systems: Design of counters using flip flops.
		CO4	Understanding PLA's, PAL's, FPGA's and processors
		CO5	Analyzing and realization of Boolean functions, half adder, encoders, decoders, flip flops and counters.
19EE1201	BASIC ELECTRICAL AND ELECTRONIC CIRCUITS	CO1	Understand basics of DC circuit analysis
		CO2	Understand fundamentals of AC circuits
		CO3	Understand characteristics of PN junction diode and applications of PN junction diode
		CO4	Understand number systems and their conversions
19SC1106	TECHNICAL SKILLS-1(CODING)	CO1	Apply the concepts of basic programming to solve the basic problems, pattern based problems
		CO2	Build solutions for problems on Numbers and array based problems , functions, recursion
		CO3	Solve problems solutions for character/string based problems and pointers
		CO4	Build solutions to programs on Data structures concepts.
PROFESSIONAL CORE COURSES			
19EC1202	COMPUTER ORGANIZATION &ARCHITECTURE	CO1	Understand the functionality and design the CPU functional units - control unit, registers, the arithmetic and logic unit, the instruction execution unit, and the interconnections among these components.
		CO2	Understand, analyze and design main, cache and virtual memory organizations.
		CO3	Understand, analyze and design different types of I/O transfer techniques.
		CO4	Understand the design issues of RISC and CISC CPUs and the design issues of pipeline architectures.
19EC2103	ANALOG ELECTRONICS CIRCUIT DESIGN	CO1	Study of BJT's and Various application in Amplifiers
		CO2	Understand various types of FET's, IC Types and analyze FET as an Amplifier
		CO3	Understand the Linear & Non-linear application of Op-AMP and analyze active filters
		CO4	Analysis of different types of oscillators, filter and regulators.
		CO5	Design and Testing of Analog circuits for realistic applications
19EC2106	EMBEDDED CONTROLLERS	CO1	Understand the architecture and programming concepts of 8086 Microprocessor
		CO2	Apply the Programming concepts of 8051 Microcontroller

		CO3	Analyse the Interfacing of Peripherals to the 8051 microcontrollers through programming. Understand the basic architectures of PIC and ARM 7 microcontrollers
		CO4	Understand the basic concepts of CORTEX STM-32 microcontroller and RTOS
		CO5	Analyze the applications of programming with 8051 and 8086 on hardware / software. Analyze the applications of programming with Arduino
19EE2102	ELECTRICAL POWER ENGINEERING	CO1	Understand working of various generating stations and economical aspects of generation
		CO2	Understand the parameters of overhead transmission lines and underground cables
		CO3	Analyze the performance of overhead transmission lines and AC/DC distribution.
		CO4	Understand Mechanical Sag, corona, Insulators and substation layouts.
19EE2103	ELECTRICAL MACHINES	CO1	Understand the basic principles of electro mechanical energy conversion.
		CO2	Compute the performance of DC machines.
		CO3	Select a suitable technique to find the voltage regulation of an alternator and analyze the load sharing.
		CO4	Determine the performance of Transformers.
		CO5	Test the performance of Electrical Machines.
19EE2201	INDUSTRIAL APPLICATIONS OF ELECTRICAL MACHINES	CO1	Understand the concepts of the 3- phase induction motor
		CO2	Select different speed control and starting methods of induction machine.
		CO3	Analyze the performance of 3-phase synchronous motor
		CO4	Select suitable motor for particular industrial applications.
		CO5	Test the performance of Motors for various applications.
19EE2202	POWER ELECTRONICS	CO1	Understand the differences between signal level and power level devices.
		CO2	Analyse the operation and performance of DC-DC Converters
		CO3	Analyse the operation and performance of voltage source inverters
		CO4	Understand the operation of phase controlled converters
		CO5	Demonstrate and test basic power electronic converters by hardware realization and MATLAB software.
19EE2203	COMPUTER APPLICATIONS IN POWER SYSTEMS	CO1	Apply load flow and fault analysis in a power system
		CO2	Understand the principle of protective relays & circuit breakers
		CO3	Understand over current, distance and differential protection schemes
		CO4	Understand rotor angle stability
		CO5	Analysis of Power system problems using simulation tools
19EE2204	CONTROL SYSTEMS	CO1	Understand the basics of Control system components and its modelling.
		CO2	Analyse the control systems under time domain and stability analysis.
		CO3	Analyze the control systems under frequency domain analysis.

		CO4	Analyze the state space model equations and Understand the control though PLC
		CO5	Test the operation of control systems using software & prototype models
19EM3201	SIGNAL PROCESSING	CO1	Understand basic concepts related to Signal Processing System
		CO2	Ability to Analyse the Signal Processing Algorithms
		CO3	Ability to Analyse the Filter design Methodologies
		CO4	Ability to Analyse Signal Processing algorithms in different case studies
19EE3101	AI TECHNIQUES IN ELECTRICAL ENGINEERING	CO1	Understand the neural network models, different architectures with different learning types and various algorithms for ANN to solve the load forecasting problems in Power systems
		CO2	Apply ANN paradigms in Electrical Engineering
		CO3	Apply the fuzzy logic concept, fuzzy sets, with suitable membership function with proper de-fuzzification methods Electrical Engineering
		CO4	Apply the different cross over methods and their elitism, convergence of algorithm Electrical Engineering
INDUSTRIAL AUTOMATION			
19EE3111	INDUSTRIAL COMMUNICATION PROTOCALS & CYBER SECURITY		Understand the various Industrial Data Communication networks
		CO2	Understand the industrial protocols and standards.
		CO3	Apply the knowledge of cyber-security in industrial and various automation domains.
		CO4	Understand the hacking concepts and counter attacking methods in automation.
19EE3112	IOT FOR INDUSTRIAL AUTOMATION	CO1	Understand the IOT terminology, technology
		CO2	Apply the IOT elements to industrial automation
		CO3	Understand the concept of M2M (machine to machine) with necessary protocols
		CO4	Apply M2M for industrial automation
19EE3113	SCADA AND DCS	CO1	Understand the need for SCADA for automation
		CO2	Understand the principle of operation of SCADA elements
		CO3	Understand principle operation of DCS
		CO4	Apply the SCADA & DCS for industrial automation
19EE3211	INDUSTRIAL DRIVES AND CONTROL	CO1	Understand electric drive system components and dynamics of a drive system.
		CO2	Develop controllers for DC drive systems.
		CO3	Develop controllers for AC drive systems.
		CO4	Apply special machine drives for precise industrial processes.
GREEN ENERGY TECHNOLOGIES			
19EE3121	SOLAR PV AND THERMAL TECHNOLOGIES	CO1	Understanding the need of Solar PV and Solar Thermal systems
		CO2	Understanding the applications of solar thermal energy systems
		CO3	Understand the design aspects of Solar PV system

		CO4	Understand the operational issues of grid connected and isolated solar PV system
19EE3122	WIND AND MICRO ENERGY SOURCES	CO1	Understand the concepts of wind energy conversion and measurement system.
		CO2	Apply the concepts of wind energy system to electric power grid.
		CO3	Understand the concepts ofgeothermal energy systems.
		CO4	Understand the concepts of tidal, ocean and bio-mass energy systems.
19EE3123	ENERGY CONSERVATION & AUDIT	CO1	Understand the energy auditing methods to meet the energy conservation and various tariffs
		CO2	Apply the energy conservation techniques to power system elements
		CO3	Understand the energy conservation opportunities in industrial motors and lighting systems
		CO4	Understand the energy conservation opportunities incooling systems and cogeneration
19EE3221	ENERGY STORAGE SYSTEMS	CO1	Interpret the significance of energy storage systems
		CO2	Demonstrate various devices for electrochemical, mechanical ,elastic and hydro storage systems
		CO3	Demonstrate various electro-magnetic energy storage systems
		CO4	Apply energy storage technologies for smart electrical energy consumption
19EE3222	ENERGY MANAGEMENT SYSTEMS	CO1	Understand the need for energy management
		CO2	Understand the Energy conservation building codes and energy conservation opportunities in different types of buildings.
		CO3	Understand the energy conservation through cogeneration plants
		CO4	Understand the energy conservation opportunities in pumps and cooling systems
SMART GRID TECHNOLOGIES			
19EE3131	ENERGY ACCOUNTING AND MANAGEMENT SYSTEMS	CO1	Understand the communication technology and standards in smart grid
		CO2	Apply the knowledge of information security in smart grids.
		CO3	Understand the Interoperability and Standards.
		CO4	Understand the hacking techniques and cyber-security in smart grid.
19EE3132	SUBSTATION PRACTICE	CO1	Understand the evolution and various components of smart grids.
		CO2	Understand the smart sub-station operation and applications in smart grids.
		CO3	Analyze various load forecasting techniques in modern electrical power systems.
		CO4	Understand the Volt/Var control techniques in smart grid.
19EE3133	DISTRIBUTION SYSTEM TESTING AND SAFETY	CO1	Understand the operation of distributed energy resources
		CO2	Interpret Maximum Power Point Tracking System
		CO3	Understand the basic concepts of Energy Storage systems

		CO4	Apply Power Electronic converters for DG integration
19EE3231	SMART GRID COMMUNICATION AND CYBER SECURITY	CO1	Understand the communication technology and standards in smart grid
		CO2	Apply the knowledge of information security in smart grids.
		CO3	Understand the Interoperability and Standards.
		CO4	Understand the hacking techniques and cyber-security in smart grid.
19EE3232	SMART DISTRIBUTION SYSTEMS	CO1	Understand the evolution and various components of smart grids.
		CO2	Understand the smart sub-station operation and applications in smart grids.
		CO3	Analyze various load forecasting techniques in modern electrical power systems.
		CO4	Understand the Volt/Var control techniques in smart grid.
ELCTRIC VEHICLE TECHNOLOGIES			
19EE3141	INTRODUCTION TO ELECTRIC VEHICLE	CO1	Understand the History, Economics and environmental issues of Electric Vehicles
		CO2	Analyze the power train components and dynamics of EV
		CO3	Select and size the motor for power train of EV
		CO4	Select and size the converter for EV
19EE3142	BATTERY MODELLING FOR ELECTRIC VEHICLES	CO1	Understand the key components of Battery management systems
		CO2	Understand the key functions of Battery management systems
		CO3	Analyze the static battery models
		CO4	Analyze the dynamic battery models
19EE3143	CHARGING STATION FOR ELECTRIC VEHICLE	CO1	Interpret Power electronic converters for electric vehicle charging
		CO2	Develop control algorithms for various electric vehicle charging modes
		CO3	Demonstrate charging station infrastructure
		CO4	Demonstrate installation of charging station
19EE3241	BATTERY STATES ESTIMATION	CO1	Understand the basic SOC estimation techniques of Battery
		CO2	Apply Kalman filter for SOC estimation of Battery
		CO3	Understand the methods to estimate the SOH of a Battery
		CO4	Select different techniques used for Power management of battery
19EE3242	ELECTRIC VEHICLE FAULT DIAGNOSIS AND CONTROL	CO1	Understand characteristics of sensors and actuators used for electric vehicle control
		CO2	Understand usage of microcontroller for digital control of electric vehicle
		CO3	Apply communication protocols for data communication in electric vehicle control system
		CO4	Model fault diagnosis system for electric vehicle
FLEXI CORE COURSES			
19EE3104	UTILISATION OF ELECTRICAL ENERGY	CO1	Identify the motor ratings for different applications
		CO2	Understand the concepts of electric heating & welding.
		CO3	Compare various illumination methods
		CO4	Apply electrical traction to different services

19EE3105	POWER QUALITY	CO1	Understand the dynamics of electrical drives
		CO2	Apply phase and chopper control techniques to DC motor drive
		CO3	Analyze stator and rotor side speed control of Induction motor drive
		CO4	Apply various control techniques to synchronous motor drive
19EE3103	RESTRUCTERED POWER SYSTEMS	CO1	Understand the concept of deregulation market structure, market architecture and power system old vs new.
		CO2	Understand electricity sector structures different structure models , bilateral and pool markets and LMP based markets
		CO3	Analyze transmission pricing methods, congestion management methods and effect of congestion on LMPs
		CO4	Understand ancillary services system security in deregulation
19EE3105	POWER QUALITY	CO1	Outline the Power Quality problems in power system.
		CO2	Model the characteristics of Long and short interruptions.
		CO3	Model the characteristics of voltage sag.
		CO4	Demonstrate various mitigation methods for interruptions and voltage sag
19EC3109	DATA NETWORKS AND PROTOCOLS	CO1	Understand the various Industrial Data Communication networks
		CO2	Understand the industrial protocols and standards.
		CO3	Apply the knowledge of cyber-security in industrial and various automation domains.
		CO4	Understand the hacking concepts and counter attacking methods in automation.
19EC3016	WIRELESS COMMUNICATIONS	CO1	Understand cellular concept, frequency reuse and hand off strategies.
		CO2	Evaluate and design wireless and cellular communication systems over a stochastic fading channel.
		CO3	Evaluate Equalizers and diversity techniques in mobile receiver design
		CO4	Analyze latest wireless technologies such as wireless systems and standards and OFDM systems
		CO5	Various key technologies used in wireless communications and the impairments in the various wireless communications.
19EM5101	FUNDAMENTALS OF INTERNET OF THINGS		Understand functional blocks of IoT devices
		CO2	Demonstrate the Technologies involved in IoT based Systems
		CO3	Apply different wireless technologies used for the development of IoT based Networks
		CO4	Analyse various IOT Real time application design Components
19EM5104	WEB INTELLIGENCE	CO1	Able to understand the basic concepts of world wide web and supported new artificial intelligence
		CO2	Ability to understand artificial intelligence and neural network-based web monitoring
		CO3	Analyse web-based BISC decision support in the web
		CO4	Analyse social networking intelligence
OPEN ELECTIVES OFFERD BY THE DEPARTMENT			
19EE40B4	Energy Estimation & Audit	CO1	Understand the present power scenario in India and need for energy estimation and Audit.

		CO2	Understand the operation of Induction motors and various energy conservation opportunities
		CO3	Understand the basics of transformers, cables and their energy conservation opportunities.
		CO4	Understand Lighting systems, pumping systems and their energy conservation opportunities.
19EE40B3	Renewable Energy Resources	CO1	Understand and analyze the solar thermal applications and solar photovoltaic cells
		CO2	Analyze the performance of wind and tidal, wave and Ocean thermal energy conversion systems
		CO3	Understand and analyze the operation of geothermal and bio energy conversion
		CO4	Understand and analyze the Biogas digesters and bio power plants