Global Institute of Technology
Department of Electrical Engineering

VISION

The vision of Electrical Engineering Department is to be recognized as a trendsetter of its undergraduate programme through focus on core competencies, multi-disciplinary collaborations, and quality in education.

MISSION

To produce highly qualified, well-formed and motivated graduates possessing fundamental knowledge of engineering practice and research of Electrical Engineering who can provide leadership and service to our nation and world**.**

Program Educational Objectives(PEO)

1: Core Competence and Successful Career: The Graduate shall be able to pursue successfully careers as Technical Leaders and Managers, Design Engineers, Consultants, Entrepreneurs or pursue Higher Studies in Electrical Engineering or other related fields.

2: Life Long Learning: The Graduate shall be able to learn, innovate, and evolve new technology lifelong.

3: Professionalism: Graduates of the program shall have professional and ethical attitude, communication skills, multidisciplinary approach and competence to relate engineering issues to broader social perspective.

Program Outcomes (PO)

The program outcomes are those skills and knowledge which students possess at the time of graduation. Society expects following capabilities from engineering graduate:

(a) Graduate engineer must have knowledge of mathematics, science, and engineering.

(b) Graduate engineer must be able to conduct experiments, as well as to analyze and interpret data.

(c) Graduate engineer must be able to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

(d) Graduate engineer must be able to function in multi-disciplinary teams.

(e) Graduate engineer must be able to identify, formulate, and solve engineering problems.

(f) Graduate engineer must have an understanding of professional and ethical responsibility.

(g) Graduate engineer must be able to communicate effectively.

(h) Graduate engineer must have the education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

(i) Graduate engineer should recognize the need, and should possess ability to engage in life-long learning.

(j) Graduate engineer must have knowledge of contemporary issues.

(k) Graduate engineer must have an ability to use the techniques, skills, and modern engineering tools.

Program Specific Outcomes (PSO)

(l) Graduate engineer must have an intuitive propensity in finding innovative and efficient solutions to long-standing problems in the Electrical Engineering domain.

(m) Graduate engineer must have an ability to design and analyze systems involving power, so as to display a high level of dexterity in resolving issues related to this field of Electrical Engineering.

Part B					
Program Educational Objectives. 1: Core Competence and Successful Career: The Graduate shall be able to pursue successfully careers as Technical Leaders and Managers, Design Engineers, Consultants, Entrepreneurs or pursue Higher Studies in Electrical Engineering or other related fields. 2: Life Long Learning: The Graduate shall be able to learn, innovate, and evolve new technology lifelong. 3: Professionalism: Graduates of the program shall have professional and ethical attitude, communication skills, multidisciplinary approach and competence to relate engineering issues to broader social perspective.					
S. No.	Subject	Semester/Code	Course Outcomes	Beyond Syllabus	Programme Objectives
1	Advance Mathematics	3EE2-01	1. Students have the capability to bridge the gap between the knowledge of engineering mathematics and its actual application and implementation in the field of Electrical	The use of Numerical Methods in solving Engineering related problems	a, l, m

			Engg. 2. Student are able to understand the concept of Laplace, Fourier analysis. 3. Student are able to gain the		

			knowledge of engineering mathematics & in actual application & implementation in field of electrical engineering		
2	Technical Communication	3EE1-02	1. Read, interpret, analyze, and evaluate complex technical and professional documents and visuals. 2. Design and produce the most commonly used business/professional communications. 3. Design and produce the most commonly used technical communications. 4. Design and produce communications specifically tailored to a number of different audiences who have diverse educational, cultural, and linguistic backgrounds, and who have various levels of expertise. 5. Design and produce communications that include visuals that are accurate, ethical, and accessible and from which more than one audience can extract the information quickly and easily. 6. Work and problem solve effectively with others to achieve a common communication goal, using collaborative techniques, respecting the work of colleagues, and meeting deadlines;	Interview Skills	f, g

			listen and speak reflectively.		
3	Power Generation Process	3EE3-04	1. Students are able to understand the generation of electrical energy through various methods. 2. Students are able to understand the demand of energy in India. 3. Students are able to understand the demand of energy in various sectors.	Geotherm al power, blue energy and cogenerati on	e, k, l
4	Electrical Circuit Analysis	3EE4-05	1. Students have the capability to apply the various methodologies to solve electrical circuit. 2. Students have the ability to	Fourier Transforms	a, e, l

			synthesis electrical circuit. 3. Students are able to understand the basic concept of network synthesis. 4. Students are able gain the various methods to solve & simplify the complex network.		
5	Analog Electronics	3EE4-06	1. Students are able to gain the knowledge about the basic of electronics. 2. It is useful for understanding the behavior of different electronics devices like oscillators, feedback amplifiers and power amplifiers. 3. Students are able to understand the knowledge and concept of different types of Amplifiers.	Junction Field Effect Transistor	a, d, e
6	Electrical Machine - I	3EE4-07	1. Students have the capability to bridge the gap between the knowledge of Electrical machine and its actual application and implementation in the field of Electrical engineering. 2. Students are able to gain the basic concept of electrical machine. 3. Students are to understand the knowledge of electrical machine so as to facilitate in application in electrical engineering.	Stepper Motor	a, b, e

7	Electromagnetic Field	3EE4-08	**1.** Apply vector calculus to static electric-magnetic fields in different engineering situations. **2.** Analyze Maxwell's equation in different forms (differential and integral) and apply them to diverse engineering problems. **3.** Examine the phenomena of wave propagation in different media and its interfaces and in applications of microwave engineering. **4.** Analyze the nature of electromagnetic wave propagation in guided medium which are used in microwave applications.	Reflection and Refraction of waves	a, d, e
8	Analog Electronics	3EE4-21	1. Students are able to gain the knowledge about the	Clipper ,Clamper ,	b, c

	Lab		basic of electronics components FET & OPAMP. 2. It is useful for understanding the behavior of different electronics devices like oscillators, feedback amplifiers and power amplifiers and their classification. 3. Students are able to understand the different types of Amplifiers which are necessary in each and every subject.	Voltage Regulators. Etc.	
9	Electrical Machine -I Lab	3EE4-22	1. Student are able to gain the basic concept of electrical machine. 2. Students are able to understand the knowledge of electrical machine and its applications. 3. Student are able to test electrical machine.	Different connection of Transformer	b, c
10	Electrical Circuit Design Lab	3EE4-23	1. Student are able to understand basic electronic circuits. 2. Acquire basic knowledge on the working of various semi-conductor devices 3. Student have ability to design electronic circuits.	Harmonic Oscillator	b, e, m
11	Industrial Training	3EE7-30	1. Students are able to apply engineering skills in real life. 2. Students can understand the industrial work of an engineer. 3. Students can understand management and administration work of industry. 4. Student will be able to present training work	Industrial Visit	d, f, h, k

			and procedure of report writing.		
12	Biology	4EE2-01	1. Demonstrate a working knowledge of the foundational concepts of biology, including cellular, organism, ecological, and evolutionary biology. 2. Rigorously and ethically apply the scientific methods to questions in biology by formulating testable hypotheses, and gathering and analyzing data to assess the degree to which they support the hypotheses.	Electrical Properties of Biological things	a,d
13	Managerial Economics and Financial Accounting	4EE1-03	1. Analyze various aspects of managerial economics, production & cost analysis, markets & pricing strategies. 2. Develop an ability to identify, formulate, and solve engineering problems by applying the subject knowledge of Managerial economics. 3. Apply capital budgeting, financial analysis techniques in evaluating various investment opportunities		C, d, f, h

14	Electronic Measurement &Instrumentation	4EE3-04	1. Students are able to gain knowledge to synthesis various type of bridge used for measurement. 2. Students are able to gain knowledge of various measuring devices. 3. Students are able to gain wide practical knowledge to measure Power, Voltage, Current, Frequency, Inductance, Capacitance and Resistance..	Study of RTD ultrasonic transducer	A, e, l, m
15	Electrical Machine - II	4EE4-05	1. Students are able to understand the basic concepts of magnetic circuits as applied to electric machines. 2. Students are able to understand generation of force and EMF that govern electro mechanical energy conversion in electric machines. 3. Students are able to gain the knowledge about torque, speed and controller of motor drives. 4. Students acquire knowledge about the applications of Electrical Machine.	Induction Generator	A, e, l, m
16	Power Electronics	4EE4-06	1. Students are able to gain the knowledge of Power	**Application in SCR's in FACTs**	A, l, m

			electronics devices. 2. Students able to gain knowledge the main switching topologies used in power electronics circuits and how they operate, how they are controlled, driven and protected. 3. Students are able to use, operate and utilize basic power electronics devices.		
17	Signals & Systems	4EE4-07	1. Students are able to apply the knowledge of applied mathematics analyze signals. 2. Students are able to analyze the spectral characteristics of continuous-time periodic and periodic signals using Fourier analysis. 3. Students are able to classify systems based on their properties and determine the response of LSI system using convolution. 4. Students are able to analyze system properties based on impulse response and Fourier analysis. 5. Students are able to apply the Laplace transform and Z-transform for analyze of continuous-time and discrete-time signals and systems. 6. Students understand the process of sampling and the effects of under sampling		A, d, e, l, m
18	Digital Electronics	4EE4-08	1. It is useful for understanding the behavior of digital logics. 2. Students are able to design of combinational circuits. 3. Students are able to design of sequential circuits.	K map up to 6 variables	A, d, e, l, m

19	Electrical Machine - II Lab	4EE4-21	1. Student are able to gain the basic concept of electrical machine. 2. Student is able to understand the use of electrical machine in industrial application in electrical engineering. 3. Student are able to understand the maintenance of electrical machine.	synchronization on of 3 phase Alternator using six Lamp Method	B, m
20	Power Electronics Lab	4EE4-22	1 Students are able to understand about the practical knowledge of	Facts technology	b, c, m

			theoretical concepts, which help them to understand various power electronic devices and components. 2. Students are alehouse modern power electronics devices and their usages.		
21	Digital Electronics Lab	4EE4-23	1. Student are able to understand the behavior of different digital electronic components. 2. Students are able to understand process &working of digital electronics and their logics along with applications. 3. Students are able to design & analyze combinational & sequential circuits.		B, d
22	Measurement Lab	4EE3-24	1. Student are able to acquire practical knowledge with theoretical concept of electrical measurement. 2. Students are able to understand the calibration of voltmeter, ammeter & wattmeter. 3. Student are able to understand the measurement of various quantities in electrical circuits.	Measurement of three phase power by two wattmeter method	b, m

23	Electrical Materials	5EE3-01	1. Students are able to explain electrical properties, characteristics of various materials, magnetic properties and superconductivity along with conductivity of metals and semiconductors materials. 2. Students are able to analyze the physics behind the electrical materials. 3. Students are able to evaluate electrical materials science essential in different industries. 4. Students are able to apply electric and magnetic properties of various materials.	Polymers	a, e, h,m
24	Power System-I	5EE4-02	1. Students are able to explain general structure of power transmission and distribution with consideration of different faults and their protection methods. 2. Students are able to solve problems of parameter measurements, fault calculations and inductance & capacitance of transmission lines. 3. Students are able to analyze the mechanical and electrical design aspects of the AC & DC transmission systems 4. Students are able to implement renewable energy sources and distributed generation with consideration of the protection system in real time projects.	Load flow study of power system	**a,e,m**

25	Control System	5EE4-03	1. Students are able to explain the fundamentals of open and closed loop control systems along with applications. 2. Students are able to solve analytical and design problems in time and frequency domain.. 3. Students are able to examine the stability using Routh-Hurwitz criteria, Root-Locus,Nyquist stability criteria, Bode plot, polar plot. 4. Students are able to analyze the response and state equation for stabilizing the analog and digital control systems. 5. Students are able to design the stable closed loop control systems using different stability condition.	Lyapunov stability	**a,e**
26	Microprocessor	5EE4-04	1. Students are able to explain the general architecture, organization, instruction sets and operations of 8051 microcontroller along with memory and peripheral interfacing. 2. Students are able to develop interfaces of ADC, DAC, counters, timers and general purpose I/O with 8051 micro-controller.. 3. Students are able to code and debug assembly language programs for applications including 8051 micro-controller, I/O and other peripheral devices. 4. Students are able to design real time applications for	Architecture, memory organization and timing diagram of 8086.	**e,k,l**

			peripheral interfacing using various communication interfaces.		

27	Electrical Machine Design	5EE4-05	1. Students are able to understand the various considerations for the choice of various parameters with respect to material selection, dimension choice etc. for machine design. 2. Students are able to design transformer, induction and synchronous machines. 3. Students are able to understand use modern techniques and CAD in designing and performance analysis of electrical machines..	Design of DC Machine	A,c,k
28	Restructured power system	5EE5-11	1. Students are able to explain the need of restructuring of power system as well as technological and economic reforms required in regulated monopoly system to implement the same. 2. Students are able to analyze and identify issues of transmission congestion, ancillary services management and market design that can be faced while restructuring a power system. 3. Students are able to compare methods of congestion management, market models and pricing schemes and identify the best suitable solution for its problem. 4. Students are able to create a restructured model for any existing power system in transforming various activities of a power system as well as electricity market	Stand alone and grid connected system	a,b,d,e

			offering social welfare and improved efficiency of power system.		
29	Power System-I LAB	5EE4-21	**1.** Students are able to understand the basic schemes of hydro, thermal, nuclear and gas power plants. **2.** Students are able to compute the feeders, distributors and EHV transmission line parameters. **3.** Students are able to apply probability tool to find load forecasting for short term, medium term and long term planning. **4.** Students are able to evaluate dielectric strength of electrical power equipments, transformer oil and flash over voltage of insulators. **5.** Students are able to differentiate the types of substations, substation equipments and filtration and Treatment of transformer oil.	Simulation of Electric Field for Different Electrode Configuration	a,b,f,

31	Microprocessor Lab	5EE4-23	1. Students are able to understand the functions, operations, and memory structure and hardware units of 8085 microprocessor kit. 2. Students are able to develop programs to perform addition, subtraction, division, block transfer, searching, sorting, etc using assembly language. 3. Students are able to build and demonstrate assembly level programs for transferring data to specified output ports in serial and parallel fashion. 4. Students are able to fabricate 8 bit LED/LCD interface to 8085 microprocessor kit using 8155 and 8255 5. Students are able to examine different waveforms using 8253 / 8254 programmable timer	Programmable DMA controller (8237/8257)	a,b,e,k,
32	System Programming Lab	5EE4-24	1. Students are able to understand features and importance of MATLAB in mathematical Programming environment. 2. Students are able to write electrical and electronic problems in MATLAB. 3. Students are able to solve problems related to Electrical and Electronic circuit applications in simulation tool. 4. Students are able to	Simulation of Reciprocity theorem for D.C circuits	b,e,k

			articulate the importance of MATLAB in research by simulation work.		
33	Industrial Training	5EE7-30	1. Students are able to select appropriate industry for his/her training. 2. Students will understand working culture of industry 3. Students learn industrial managerial structure and manufacturing process. 4. Students will be able to identify real time problem in selected industry for his internship/ project. 5. Student will be able to write training report on industrial training and learning aspects inside the industry premises. 6. Students will be able to enhance their communication skills and confidence level through presentation.	Audio visual equipments are used extensively so as to aid visual retention	a,c,d,e,f,h,k

34	Computer Architecture	6EE3-01	1. Students are able to understand the architectures, addressing modes and peripheral connects of various 16 and 32 bit microprocessors. 2. Students are able to understand various techniques in memory organization for high performance processors. 3. Students are able to explain RISC/CISC instructions and understand the instruction level pipelining in microprocessors. 4. Students are able to learn the additional topics of DSP, SOC and MIPS architectures.	Use of JavaScript in HTML page	b,d,e

35	Power System-II	6EE4-02	1. Students are able to analyze the power flow equations for a given power system network 2. Students are able to use swing equations and power angle curve for the stability of the power systems. 3. Students are able to apply power compensation schemes such as SVC and STATCOM to control bus voltage and system frequency. 4. Students are able to understand SCADA system for monitoring and control of power system using PMUs and WAMs 5. Students are able to evaluate and understand power system economics with different market models.	Modeling of power system components	a,e,k
36	Power System Protection	6EE4-03	1. Students are able to explain fundamentals of protection systems, scope and application in power system. 2. Students are able to demonstrate concept of protection system, over-current protection, equipment protection, digital protection and system protection. 3. Students are able to form basic building of various subjects to be taught later on as a part of curriculum such as modern control system.	NEC and importance of relevant IS/IEC specifications related to switchgear and protection	a,j,l

			4. Students are able to implement the various protection schemes in power system protection 5. Design and simulate protection schemes by using EMTP.		
37	Electrical Energy Conversion and Auditing	6EE4-04	1. Students will be able to describe the energy scenario in India. 2. Students will be able to apply energy conservation techniques for developing energy efficient equipment. 3. Students will be able to develop methods of energy management. 4. Students will be able to prepare process flow of energy audit of an industry or organization..	Stand alone and grid connected system	a,e,h,j,l
38	Electrical Drives	6EE4-05	1. Students are able to classify types of electric drive systems based on nature of loads, control objectives, performance and reliability. 2. Students are able to use power electronic techniques to control DC motor drive. 3. Students are able to reply vector control technique to specify three phase induction motor characteristics. 4. Students are able to design and develop power electronic based circuits for control strategy of slip ring motor.	Use of DSTATCOM in DFIG	a,e,k

39	Power System Planning	6EE5-11	1. Students are able to analyze power system reliability at different levels such as generation, transmission and distribution system. 2. Students are able to develop generation planning model considering loss of load indices. 3. Students are able to compare the reconfiguration and restoration of supply through transmission system and its effect in planning analysis. 4. Students are able to compute the distribution system reliability indices such as SAIFI, SAIDI and CAIDI	Power Plant Instrumentation and Control	a,e,k,l
40	PS-II LAB	6EE4-21	1. Analyze different fault conditions in power system using simulation tool. 2. Apply load flow analysis such as GS, NR and fast decoupled in power system problems using simulation tool. 3. Perform experiment on short circuit analysis in a synchronous machine. 4. Evaluate economic load dispatch problem for given power system network. 5. Execute transient stability analysis using MATLAB Software.	ETAP Simulation	a,b,e,l

41	Electric Drives Lab	6EE4-22	1. Identify relevant information to supplement to the Electric Drives 2. Set up control strategies to synthesize the voltages in dc and ac motor drives 3. Develop testing and experimental procedures applying basic knowledge in electronics, electrical circuit analysis, electrical machines 4. Determine accurate modeling parameters for various general-purpose electrical machines and power electronics devices required for designing a system and solve drives related problems. 5. Estimate constraints, uncertainties and risks of the system (social, environmental, business, safety issues etc.)	Resonant dc to dc converter	a, b,e

42	Power System Protection LAB	6EE4-23	1. Understand the realization of over current, distance and differential relays using micro-controller. 2. Perform analysis of power systems subject to analyze different faults in power system. 3. Realize the various dynamic characteristics of digital relays for protection of transmission lines, transformers. 4. Analyze the operation of micro-controller based directional over current relay in DMT type and IDMT type.	Bus bar protection and CT/PT	a, b, l
43	Modeling and Simulation LAB	6EE4-24	1. Learn and recall various software tools that are required for modeling of machines and Power system. 2. Simulate, analyze and compare performance of both synchronous and induction machines. 3. Analyze and select best suitable FACTS controller as per the needs of application	Lab View Software	a,b,k,l

			4. Create an efficient SMIB model using FACTS controller.		
44	Wind and Solar energy system	7EE5-11:	1.Able to learn about the general overview and statics of solar and wind power. 2. Understand about the basic and advanced terminologies related to solar and wind energy generation. 3. Learn about the power electronic converters use in solar and wind power plants 4. Proficiency in learning about the machinery used in wind power plant and their configuration 5. Knowledge about the Grid terminologies, MPPT algorithm, hybrid of wind solar 6. learn about the power generation by using solar thermal and their applications in real life.		E,k,l
45	Embedded Systems Lab	7EE4-21	1. Students are able to understand the functions, operations, memory structure and hardware units of system 2. Students are able to develop programs to perform addition,	Use of Keil micro vision and ECE flash s/w	a,b,e,k,

			subtraction, division, block transfer, searching, sorting, etc. 3. Students are able to understand about interfacing.		
46	Advance control system lab	7EE4-22	1. Student gain the knowledge of fundamentals of MATLAB. 2. Students are able to apply the basic concepts of control system using MATLAB software.	MATLAB & Control System tool box	b,e,k

47	Industrial Training	7EE7-30	1. Students are able to apply Engineering skills in real life. 2. Students can understand about the industrial work of an engineer	Review of quality and environment standards	d, f, h
48	Seminar	7EE7-40	1. Students are able to apply Engineering skills in real life. 2. Students can acquire confidence of presentation and report writing.	Audio visual equipment's are used extensively so as to aid visual retention	a, c, d, e, f,h, k
49	HVDC Transmission System.	8EE4-11	**1.**Develop the knowledge of HVDC transmission and HVDC converters and the applicability and advantage of HVDC transmission over conventional AC transmission. **2.**Analyze various types of converters and their working. **3.** Study and understand the control scheme of HVDC converters. **4.**Study and understand various components, faults and breaker operation in HVDC systems.	Stand alone and grid connected system	b,e,k
50	Energy Systems Lab	8EE4-21	1. Identify the different components of energy conversion technologies. 2.Operate machines in laboratory. 3. Collect and report experimental data. 4. Analyze, interpret and appraise experimental	Bus bar protection and CT/PT	b,e,k

			results including their uncertainty analysis. 5. Compare theoretical and actual performances of energy conversion technologies.		
51	8EE7-50	Project	The student should – 1.be able to apply the relevant knowledge and skills, which are acquired within the technical area, to a given problem within given constraints, even with limited information, independently analyze and discuss complex inquiries/problems. 2.be able to handle larger problems on the advanced level within the technical area - Reflect on, evaluate, and critically assess one's own and others' scientific results. 3.be able to document and present one's own work, for a given target group, with strict requirements on structure, format, and language usage. 4. be able to identify one's need for further knowledge and continuously develop one's own competencies.	Smart grid, ,SCADA, Different Programming Languages. E.g. C++, Java.	a,b,c,d,e, f,g,h,i,j,k ,l,m