Department of Electrical Engineering
2019-2020
Program Outcomes

Program Outcomes

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems in Electrical engineering.
2. **Problem analysis**: Identify, formulate, research literature, and analyze complex Electrical engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex Electrical engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions in Electrical engineering.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex Electrical engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional Electrical engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional Electrical engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the Electrical engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings in Electrical engineering.
10. **Communication**: Communicate effectively on complex Electrical engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the Electrical engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change in Electrical engineering.

PSO-Program Specific Objectives

PSO1 Graduates will be able to contribute for the development of automation.
PSO2 Graduates will be able to contribute towards integration of the green energy.

3.1.Establish the correlation between the courses and the Program Outcomes (PO's) and Program Specific Outcomes (PSO's) (20)

3rd Semester Subjects

Subject- Advance Mathematics (AM) **Code-** 3EE2-01

CO1	Use the numerical methods for Interpolation, numerical differentiations, Integration, transcendental equations and polynomials.
CO2	Define Laplace Transform and apply it to solve Ordinary differential equations and circuit differential equations.
CO3	Understand the concept of Fourier Transform and apply the Z-Transform techniques in solving difference equations.
CO4	Differentiation of complex function and some of its properties.

Subject- Technical Communication (TC) **Code-** 3EE1-02

CO1	Able to express themselves better in technical writing by understanding the concept, style and methodology used in Technical communication.
CO2	Able to pursue higher studies by working on all aspects of English Language and also develop a better understanding of process and design of technical texts.
CO3	Able to get an in depth knowledge of technical communication used in professional life by getting to know all the forms and aspects of Technical Communication.

Subject- Power generation Process (PGP) **Code-** 3EE3-04

CO1	To familiarize the basic concepts and phenomenon of different sources of Power Generation.
CO2	To impart the knowledge of different turbines used in the generating stations with the analytical methods.
CO3	To analyses the Tariff methods for electrical energy consumption in the prospect of optimum utilization of electrical energy.

Subject- Electrical Circuit Analysis (ECA) **Code-** 3EE4-05

CO1	Analyze the basic rule of electric network theorems.
CO2	Analyze the transient and steady state conditions of AC and DC circuits
CO3	Analyze the two port network functions and Laplace transform of electrical circuits

Subject- Analog Electronics (AE) **Code-** 3EE4-06

CO1	Students Able to apply knowledge of semiconductor physics, Diodes and Transistor.
CO2	Students can understand & analysis MOSFET and operational amplifier.
CO3	Students Able to Design Linear and Nonlinear application of Op-amp.

Subject- Electrical Machine - I (E/MC -1) **Code-** 3EE4-07

CO1	To understand the basic concept of AC Machine (Transformer) and DC machine.
CO2	Analysis the response of AC/DC electrical Machine.
CO3	To troubleshoot the operation of electrical Machine.

Subject- Electromagnetic Field (EMF) **Code-** 3EE4-08

CO1	Acquire basic understanding of vectors, their representation and conversion in different coordinate systems.
CO2	Able to compute the force, fields & energy of the electrostatic & magnetostatic fields. Able to analyze the materials, conductors, dielectrics, inductances and capacitances.
CO3	Understand the concept of time varying field and able to solve electromagnetic relation using Maxwell equations. Also able to analyze the electromagnetic waves.

Subject: Analog Electronics Lab **Code:** 3EE4-21

CO-1	Students able to plot gain-frequency char of BJT and FET.
CO-2	Students can explain Oscillator and determine frequency with variation of L and C.
CO-3	Students able to analysis Voltage Regulator and UJT

Subject: Electrical Machines-I Lab **Code:** 3EE4-22

CO-1	Distinguish different types of DC machines.
CO-2	Distinguish different types of transformer.
CO-3	Analyze the performance characteristics of DC machines and transformers.

Subject: Electrical Circuit Design Lab **Code:** 3EE4-23

CO-1	Analyze the Data sheet, Soldering and De-soldering process.
CO-2	To simulate various semiconductor devices using tools such as Multisim.
CO-3	To Validate various semiconductor devices on PCB.

Subject: Industrial Training **Code**: 3EE7-30

CO-1	Ability to acquire and apply fundamental principles of engineering.
CO-2	Awareness of the social, global and environmental responsibility as an engineer.

4th Semester Subjects

Subject- Biology **Code-** 4EE2-01

CO1	Demonstrate deep understanding of five core concepts in biology: evolution; pathways and transformations of energy and matter; information flow, exchange, and storage; structure and function; and biological systems.
CO2	Use the standard skills and methodologies of biology to answer scientific questions.
CO3	Apply the scientific method, reasoning and appropriate mathematics to describe, explain and understand biological systems.

Subject- Managerial Economics and Financial Accounting (MEFA) **Code-** 4EE1-03

CO1	Apply Economic principles to management decisions
CO2	Understand the market systems & the pricing theory based on demand & supply, production & cost analysis
CO3	Able to analyze Financial interpretation on the basis of basic financial concepts

Subject- Electronic Measurement & Instrumentation (EMI) **Code-** 4EE3-04

CO1	Students familiar to different-different instruments.
CO2	Students understand the concept of poly phase and about potentiometer.
CO3	Students can measure resistance, inductance and capacitance by meter and design AC Bridge.

Subject- Electrical Machine - II (EM/C-II) **Code-** 4EE4-05

CO1	To understand the basic concept of AC rotating machines.
CO2	To understand the response of Induction machine and synchronous machines.
CO3	To analyze the operation of Induction machine and synchronous machines.

Subject- Power Electronics (PE) **Code-** 4EE4-06

CO1	To learn the details of power semiconductor switches (Construction, Characteristics and operation).
CO2	To understand the working of various types of converters.
CO3	Analyze the converters under various load types.

Subject- Signals & Systems (SS) **Code-** 4EE4-07

CO1	Analyze different types of signals and system properties and Investigate whether the system is stable.
CO2	Represent continuous and discrete systems in time and frequency domain using different transforms
CO3	Acquire an understanding of Sampling and reconstruction of a signal.

Subject- Digital Electronics (DE) **Code-** 4EE4-08

CO1	To introduce basic postulates of Boolean algebra and show the correlation between Boolean expressions.
CO2	To outline the procedures for the analysis and design of combinational circuits.
CO3	Design various synchronous and asynchronous sequential circuits.

Subject: Electrical Machine Lab -II **Code**: 4EE4-21

CO-1	Set up testing strategies with specific instruments to perform experiment on induction machine and Synchronous machine.
CO-2	Measure the required electrical quantities, calculate the electrical parameters and reach to a conclusion with the help of the performance characteristics induction machine and Synchronous machine.
CO-3	Understand the effectiveness of the team -based laboratory activities in the context to social, environmental and safety issues.

Subject: Power Electronics Lab **Code**: 4EE4-22

CO-1	To learn construction, operating principle and characteristics of various power electronics devices ie BJT, MOSFET, IGBT etc.
CO-2	To understand the working of various types of power electronic converters.
CO-3	Analyze the converters under various load types.

Subject: Digital Electronics lab **Code**: 4EEA-23

CO-1	To implement various circuits by using universal logic gates.
CO-2	To implement efficient digital circuits by minimization technique.
CO-3	To design combinational circuits like Mux, De- Mux, Coder, Decoder which are very useful in digital communication.
CO-4	To design a sequential circuits which are very useful in memory devices and this modern age of digitalization.

Subject- Measurement Lab **Code-** 4EE4-24

CO1	Students understand about C.R.O. and Digital C.R.O.
CO2	Students can calibrate ammeter and voltmeter and measure resistance and inductance.
CO3	Students can calibrate single phase energy meter and measure power by watt meter.

5th Semester Subjects

Subject- Electrical Materials (EM) **Code-** 5EE3-01

CO1	To provide students with a thorough understanding of the electrical properties and characteristics of various materials used in the electrical appliances, devices, instruments and in the application associated with generation, transmission and distribution of electric power.
CO2	To prove students with a moderate level understanding of the physics behind the electrical engineering materials
CO3	An understanding of the electrical engineering material science essential for them to work in different industries and also motivate them to do innovative research while going for higher studies.

Subject- Power System - I (PS-I) **Code-** 5EE4-02

CO1	Identify the different parameters of transmission lines and understand the basic power system.
CO2	Analysis the overhead and underground transmission and distribution lines and identify the faults.
CO3	Design and analysis of over voltage generation and its protection in power system.

Subject- Control System (CS) **Code-** 5EE4-03

CO1	To Understand concepts of the feedback control, stability, mathematical modeling, controllability, observability, continuous and discrete time system.
CO2	Employ time and frequency response analysis to predict and diagnose stability and performance parameters of the system for standard input functions.
CO3	Design and implement P-I-D controllers, lead-lag compensator, feedback controller and state model for a given system of equations.
CO4	Solve linear, non-linear and optimal complex control problems.

Subject- Microprocessor (MP) **Code-** 5EE4-04

CO1	To differentiate and analyze the properties features of Microprocessors & Microcontrollers and Understand the basic building blocks of a microcontroller.
CO2	Identify a detailed s/w & h/w structure of the Microcontrollers and programming techniques
CO3	Illustrate how the different peripherals are interfaced with Microcontrollers.

Subject- Electrical Machine Design (EMD) **Code-** 5EE4-05

CO1	Apply theoretical concepts in designing conventional electrical machines
CO2	Select appropriate material for designing electrical machines
CO3	Estimate the machine performance based on the design outcome by data interpretation

Subject- Restructured Power System (RPS) **Code-** 5EE5-11

CO1	Understand the need for restructuring of Power Systems, discuss different market models, different stakeholders and market power.
CO2	Understand and generalize the functioning and planning activities of ISO, transmission open access pricing issues and congestion management.
CO3	Define transfer capability and estimate the transfer capability of small power system and also define ancillary services and understand reactive power as ancillary service and management throw synchronous generator.

Subject- Power System-I Lab **Code-** 5EE4-21

CO1	To understand the basic scheme of conventional power plant and its equipment's.
CO2	Calculate the voltage drop, size of conductor in distribution line and break down strength of transformer oil.

Subject: Control System Lab **Code:** 5EE4-22

CO-1	Students able to make transfer function in state space and draw it is response.
CO-2	Analysis and Design 1st and 2nd order electrical network.
CO-3	Students able to draw Bode plot and Design PID controller.

Subject- Microprocessor Lab **Code- 5EE4-23**

CO1	Describe an 8 bit microprocessor architecture (8085A), understand the concepts of memory and I/O interfacing, concept of interrupts, buses and microprocessor based system architecture.
CO2	Apply the fundamentals of assembly level programming of 8085 microprocessors to perform experiments.
CO3	Analyze abstract problems and apply a combination of hardware and software to address the problem.

Subject- System Programming Lab **Code- 5EE4-24**

CO1	Student will be able to learn about various data ty3pes, variables, commands and control structures, for carry out simple numerical computations using MATLAB.
CO2	Able to program scripts, functions and able to generate plots using the MATLAB environment
CO3	Able to learn basic fundamentals of MATLAB Simulation.

Subject- Industrial Training **Code- 5EE7-30**

CO1	Able to understand the value of achieving perfection in respective project work.
CO2	Able to plan and implement project in their industrial and In-plant training project work.
CO3	Able to understand the impact of engineering solution and industrial safety in a global and social context.

6th Semester Subjects

Subject- Computer Architecture (CA) **Code-** 6EE3-01

CO1	Ability to understand the functional units of a processor and various micro operations.
CO2	Examine the arithmetic problems and principles of computer design.
CO3	Analyze different architectural and organizational design issues that can affect the performance of a computer.
CO4	Apply the concept of cache memory, virtual memory and I/O Organization.

Subject- Power System - II (PS-II) **Code-** 6EE4-02

CO1	Able to study about load flow and stability analysis of power system using different computational methods.
CO2	Able to understand the frequency, speed, voltage and power flow control and monitoring of power system components using different methods.
CO3	Able to understand power system economics and management using different methods.

Subject- Power System Protection **Code-** 6EE4-03

CO1	Acquire detailed knowledge on different Protective Equipment's of Protection system.
CO2	Ability to identify Protection Schemes, Fourier analysis and estimation of Phasors from DFT
CO3	Develop design knowledge on Modelling and Simulation of Protection.

Subject- Electrical Energy Conversion and Auditing (ECA) **Code-** 6EE4-04

CO1	Conceptual knowledge of the technology, economics and regulation related issues associated with energy conservation and energy auditing
CO2	Ability to analyze the viability of energy conservation projects.
CO3	Capability to integrate various options and assess the business and policy environment regarding energy conservation and energy auditing

Subject- Electric Drives (ED) **Code-** 6EE4-05

CO1	Acquire detailed knowledge on DC and AC drive and their modeling for stead-state and transient analysis.
CO2	Develop capability to choose a suitable motor and Power Electronics Converter from a description of drive requirement.
CO3	Develop design knowledge on how to design the speed control and current control loops of a Electric motor drive.

Subject- Electrical and Hybrid Vehicles (EHV) **Code-** 6EE5-13

CO1	Analyzing different aspects of drive train topologies.
CO2	To understand upcoming technology of Electric Vehicle.
CO3	Learn different energy management strategies.

Subject- Power System - II Lab (PS-II) **Code-** 6EE4-21

CO1	Able to analyze the fault, load flow and stability analysis of power system using different computational methods.
CO2	Able to analyze about the power, voltage and overload security using software.
CO3	Able to understand power system economics and management using different methods.

Subject- Electrical Drives Lab **Code-** 6EE4-22

CO1	To simulate various converter using MATLAB.
CO2	Acquire the knowledge of 3 phase converter, dual converter, AC voltage regulator.
CO3	Identify speed control of induction motor, DC motor, PSMS motor.

Subject: Power System Protection Lab **Code**: 6EE4-23

CO-1	Analyze, apply, and calculate settings for different types of protection schemes.
CO-2	Identify the new developments in protective relaying and applications using microcontroller

Subject: Modelling and simulation lab **Code**: 6EE4-24

CO-1	Acquire expertise in usage of modern tools
CO-2	Apply steady state stability analysis of single, two and multi machine system to solve stability problems
CO-3	Identify Voltage stability problem and preventive methods for voltage collapse and Design different methods to improve stability of power system.

7th Semester Subjects

Subject- Power System Planning **Code-** 7EE1A

CO1	Recognise the power planning tools and component of power system planning
CO2	Implement economic analysis and load management in power system planning
CO3	Execute computer aided process and environmental factors in optimal power system expansion planning

Subject- Power System Analysis **Code-** 7EE2A

CO1	Able to design power system network and find a proper solution for unhealthy power system network.
CO2	Able to select protection schemes for complex power system network.
CO3	Able to find optimized solutions by different optimization techniques for power system problems.

Subject- Artificial Intelligence Techniques **Code-** 7EE3A

CO1	Student will be able to describe concept of Artificial Intelligence and apply various searching techniques
CO2	Student will be able understand various knowledge representation techniques for Artificial Intelligence system.
CO3	Student will be able describe concept of Natural Language processing
CO4	Students will learn the basic concepts of Learning in system, Neural Networks and Expert Systems

Subject- Non Conventional Energy Sources **Code-** 7EE4A

CO-1	Realize the current energy situation of India and the world and analyze and develop prevailing tidal power generation techniques
CO-2	Analyze the solar radiation geometry on earth's surface and various technique available for solar energy generation.
CO-3	Utilize various techniques of biomass energy conversion for the production of electricity & alternative fuels.

Subject- Power System Engineering **Code-** 7EE5A

CO1	Understanding about economic operation of power systems.
CO2	Understanding and analyze steady state, Transient and dynamic stability.
CO3	Analyze the excitation system, compensation and interconnected power system.

Subject-Economic Operation of Power Systems **Code-** 7EE6.3A

CO1	Select the operation of alternators for minimum energy cost.
CO2	Formulate the most economical schedule of operation for various power plants.
CO3	Combine power system analysis and economic appraisal to provide insight and ability for the future.

Subject: Power System Planning Lab (PSP Lab) **Code: 7EE7A**

CO-1	Students understand about electricity regulation and planning of power system.
CO-2	Students can able to explain Rational Tariff and electrical forecasting.
CO-3	Analysis about Rural Electrification.

Subject: Power System Modelling & Simulation Lab (PSMS LAB) **Code**: 7EE8A

CO-1	Acquire expertise in usage of modern tools
CO-2	Apply steady state stability analysis of single, two and multi machine system to solve stability problems
CO-3	Identify Voltage stability problem and preventive methods for voltage collapse and Design different methods to improve stability of power system

Subject: Industrial Economics & Management (IEM Lab) **Code**: 7EE9A

CO-1	Describe and explain the determinants of the size and structure of firms and the implications of the separation of ownership and control
CO-2	Describe and explain the pricing behavior by firms with market power and its welfare implications
CO-3	Apply analytical models of firm behavior and strategic interaction to evaluate various business practices, including tacit collusion, entry deterrence, product differentiation, price discrimination and vertical restraints
CO-4	Recognize and explain the basic determinants of market structure and the key issues in competition policy and regulation.

Subject: Practical Training & Industrial visit (PTR) **Code**: 7EETR

CO-1	Improve the interpersonal & communication skills and awareness about the industrial environment.
CO-2	Develop the skills, competencies and points of view needed by professionals in the field engineering.
CO-3	Development of presentation skills & Discussion and critical thinking about topics of current intellectual importance.

Subject: Project Stage-1 **Code**: 7EEPR

CO-1	Apply relevant technical knowledge and skills, within the main area, to a given problem.
CO-2	Analyze and discuss complex inquiries/problems and conduct an Engineering Project on the advanced level within the main area and assess the scientific results.
CO-3	Able to document and present one's work with strict requirements on structure, format, language usage , able to identify future scope and continuously develop one's own technical knowledge.

8th Semester Subjects

Subject- EHV AC/DC TRANSMISSION (EHV AC/DC) **Code-** 8EE1A

CO1	To understand about corona losses, interference, problems in EHV transmission and how their effects can be minimized.
CO2	Know about the need to control the frequency, Voltage and how it is controlled.
CO3	Analysis of FACTS devices, HVDC Transmission system and need of FACTS devices and DC link in power system.

Subject- ELECTRIC DRIVE & THEIR CONTROL (EDTC) **Code-** 8EE2A

CO1	Able To understand basic concepts of electric drives
CO2	Able To understand DC drive, Braking of drives
CO3	Able To understand braking and speed control of induction machine and synchronous machine.

Subject- PROTECTION OF POWER SYSTEM (PPS) **Code-** 8EE3A

CO1	To design CT and CVT used in protection system,
CO2	To plan over current protection scheme, dangerous currents protection
CO3	To plan electrical equipment and transmission line protection

Subject- UTILIZATION OF ELECTRIC POWER (UEP) **Code-** 8EE4.1A

CO1	Understand the concept of electric heating, welding, lighting, electrolytic processes and electric traction systems.
CO2	Apply the knowledge to solve the problem related with the electric heating, welding and lighting, electrolytic process and electric traction systems.
CO3	Analyze the materials, merits and demerits in electric heating, welding, lighting, electrolytic processes and electric traction systems.

Subject- **COMPUTER BASED POWER SYSTEM LAB (CBPS LAB) (2019-2020)** **Code-** 8EE5A

CO1	Explore simulation results and effective documentation of all power system problems.
CO2	Perform steady state power flow analysis of power system networks using Gauss-Seidel, Newton-Raphson and Fast decoupled iterative methods.
CO3	Acquire expertise in usage of modern tools

Subject- Electrical Drives and their Control Lab **Code-** 8EE6A

CO1	Acquire expertise in usage of MATLAB.
CO2	Acquire the knowledge of 3 phase converter, dual converter, AC voltage regulator.
CO3	Identify speed control of induction motor, DC motor, PSMS motor.

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Subject: High Voltage Engineering Lab **Code:** 8EE7A

CO-1	Students understand about transformer oil.
CO-2	Students understand the concept of insulating material using Schering Bridge.
CO-3	Students can understand high voltage testing of electrical equipment and design EHV transmission line.

Subject: Seminar **Code:** 8EESM

CO-1	To study research papers for understanding of a new field, in the absence of a textbook, to summarize and review them
CO-2	To identify promising new directions of various cutting edge technologies.
CO-3	To effectively communicate by making an oral presentation before an evaluation committee.

Subject- PROJECT **Code-** 8EEPR

CO-1	Student will be able to formulate a real time innovation problem related to engineering society, environment, and apply prior knowledge/skill to analyse problem
CO-2	Design a methodology based on the inferences drawn out of literature survey to solve the problem using modern tools of engineering and be able to evaluate one's own work with expected outcome
CO-3	Students will be able to learn skills to lead and work in a team manage project in phases learn financial aspects technical report writing and present work in as per predefined guidelines

3.1.2. CO-PO matrices of courses selected in 3.1.1 (six matrices to be mentioned; one per semester from 3rd to 8th semester) (05)

3th Semester Subjects

Subject Code	COs	Program Outcomes (POs)											
		PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
3EE2-01	CO-1	3	1	-	-	-	-	-	-	1	1	-	1
	CO-2	3	1	-	-	-	-	-	-	1	1	-	1
	CO-3	3	1	-	-	-	-	-	-	1	1	-	1
	CO-4	3	1	-	-	-	-	-	-	1	1	-	1
3EE1-02	CO-1	-	1	-	2	-	2	1	-	1	3	2	1
	CO-2	-	1	-	3	-	2	1	-	1	3	2	1
	CO-3	-	1	-	3	-	2	2	1	1	3	2	1
3EE3-04	CO-1	3	2	3	1	1	3	3	1	1	3	1	3
	CO-2	3	2	1	1	1	2	1	1	1	2	1	2
	CO-3	3	2	1	2	1	2	1	1	1	2	1	2
3EE4-05	CO-1	3	3	1	2	1	2	-	-	2	1	-	-
	CO-2	2	2	2	1	1	1	-	-	3	1	-	-
	CO-3	3	2	1	2	2	1	-	-	2	1	-	-
3EE4-06	CO-1	3	2	2	-	-	2	2	-	3	2	2	2
	CO-2	3	3	-	1	-	2	3	-	3	2	3	2
	CO-3	3	2	2	-	-	2	3	-	3	3	2	2
3EE4-07	CO-1	3	3	2	2	1	0	1	0	1	2	1	2
	CO-2	3	3	2	2	1	0	1	0	1	2	1	2
	CO-3	3	3	2	2	1	0	1	0	1	2	1	2
3EE4-08	CO-1	3	2	2	-	-	-	1	1	3	2	2	1
	CO-2	3	3	2	1	-	1	3	1	3	2	2	2
	CO-3	3	2	1	1	-	1	2	1	3	2	2	2
3EE4-21	CO-1	3	2	1	1	3	1	-	1	2	1	1	2
	CO-2	3	3	2	2	1	-	1	-	2	1	2	1
	CO-3	3	2	2	1	2	-	-	-	3	2	2	2
3EE4-22	CO-1	3	2	2	1	1	1	-	1	1	-	-	2
	CO-2	3	2	2	2	1	2	-	1	1	-	-	1
	CO-3	2	2	2	2	1	1	-	1	1	-	-	1
3EE4-23	CO-1	3	2	1	1	2	2	2	1	1	1	1	3
	CO-2	3	2	2	1	2	3	2	1	1	1	1	3
	CO-3	3	2	2	1	3	3	3	1	1	1	1	3
3EE7-30	CO-1	3	3	1	3	2	1	2	-	-	-	1	-
	CO-2	3	2	2	-	3	2	-	-	1	-	-	1

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4th Semester Subjects

Subject Code	COs	Program Outcomes (POs)											
		PO-1	**PO-2**	**PO-3**	**PO-4**	**PO-5**	**PO-6**	**PO-7**	**PO-8**	**PO-9**	**PO-10**	**PO-11**	**PO-12**
4EE2-01	CO-1	3	-	-	-	-	3	2	-	-	-	-	3
	CO-2	-	3	2	-	3	3	-	3	-	2	-	3
	CO-3	-	3	3	3	-	-	3	-	-	-	-	3
4EE1-03	CO-1	0	0	2	3	0	0	2	0	1	0	3	1
	CO-2	0	0	1	3	0	0	1	0	1	0	3	2
	CO-3	0	0	1	3	0	0	1	1	1	1	3	2
4EE3-04	CO-1	3	2	3	-	1	2	2	-	3	2	2	3
	CO-2	3	3	-	1	-	2	3	-	3	3	2	2
	CO-3	3	2	3	-	1	2	3	-	3	3	3	2
4EE4-05	CO-1	3	3	2	2	-	-	-	-	1	1	1	3
	CO-2	3	3	2	2	-	-	-	-	1	1	1	3
	CO-3	3	3	2	2	-	-	-	-	1	1	1	3
4EE4-06	CO-1	3	2	1	3	1	1	-	-	2	1	1	3
	CO-2	3	3	2	1	2	-	-	-	2	-	1	-
	CO-3	3	3	3	2	1	2	2	-	2	-	2	3
4EE4-07	CO-1	3	3	3	2	2	2	-	-	2	-	1	2
	CO-2	3	3	3	2	2	1	-	-	2	-	1	1
	CO-3	3	2	2	2	2	1	-	-	1	-	1	-
4EE4-08	CO-1	3	3	3	-	-	3	3	2	-	1	1	3
	CO-2	3	2	1	-	3	2	3	1	1	-	-	3
	CO-3	3	3	3	2	2	3	-	-	-	2	3	3
4EE4-21	CO-1	3	3	2	2	2	2	2	2	2	2	2	3
	CO-2	3	3	2	2	2	2	2	2	2	2	2	3
	CO-3	2	2	2	2	2	3	1	3	3	2	3	3
4EE4-22	CO-1	3	2	2	1	2	-	-	1	1	-	-	2
	CO-2	3	2	2	1	2	-	-	1	2	-	-	2
	CO-3	3	2	2	1	2	-	-	1	1	-	-	2
4EE4-23	CO-1	3	2	2	3	3	2	1	1	3	2	3	3
	CO-2	3	3	3	3	3	1	2	1	3	2	3	3
	CO-3	3	3	3	3	3	1	2	1	3	2	3	3
	CO-4	3	3	3	3	3	1	2	1	3	2	3	3
4EE4-24	CO-1	3	2	1	1	3	1	-	1	2	1	2	2
	CO-2	3	2	2	2	2	-	1	-	3	2	1	1
	CO-3	3	3	2	1	3	-	-	-	2	2	3	2

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE	Jaipur Engineering college and research centre, Shri Ram ki Nangal, via Sitapura RIICO Jaipur- 302 022.	**Academic year- 2019-2020**

5th Semester Subjects

Subject Code	COs	Program Outcomes (POs)											
		PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
5EE3-01	CO-1	3	3	3	3	-	2	-	2	-	-	-	3
	CO-2	3	2	2	2	-	2	-	-	3	-	1	-
	CO-3	3	2	2	2	-	2	-	-	-	-	3	3
5EE4-02	CO-1	3	2	2	3	2	2	2	-	-	-	2	-
	CO-2	3	2	1	2	3	2	-	-	1	-	2	-
	CO-3	3	2	3	2	-	3	3	-	1	-	2	-
5EE4-03	CO-1	3	3	2	2	1	2	1	1	1	3	1	1
	CO-2	3	3	2	2	1	3	2	2	2	2	2	1
	CO-3	3	3	3	3	2	3	2	2	2	2	3	2
	CO-4	3	3	2	2	1	3	2	2	2	2	2	1
5EE4-04	CO-1	3	3	3	2	3	2	2	1	2	1	2	2
	CO-2	2	3	3	2	3	2	2	1	3	1	2	2
	CO-3	2	3	3	2	3	2	2	1	2	1	2	2
5EE4-05	CO-1	3	3	2	2	2	2	1	-	-	-	2	3
	CO-2	3	3	2	2	2	2	1	-	-	-	2	3
	CO-3	3	3	3	2	2	2	1	-	-	-	2	3
5EE5-11	CO-1	3	3	1	2	1	-	-	-	2	1	-	-
	CO-2	3	2	1	1	1	-	-	-	2	-	-	-
	CO-3	2	2	1	1	2	-	-	-	2	-	-	-
5EE4-21	CO-1	3	3	3	3	3	1	1	2	1	2	2	3
	CO-2	3	1	1	2	3	1	1	1	1	1	1	3
5EE4-22	CO-1	3	2	2	1	2	-	1	-	2	2	1	2
	CO-2	3	3	1	2	3	-	-	-	2	1	1	3
	CO-3	3	2	3	2	3	-	-	-	3	1	1	2
5EE4-23	CO-1	3	3	2	3	2	3	3	3	2	2	2	3
	CO-2	2	3	3	3	3	2	2	2	2	3	2	3
	CO3	2	2	2	2	2	2	2	3	3	3	3	3
5EE4-24	CO-1	2	3	3	2	3	1			1		1	2
	CO-2	2	3	3	2	3	1			1		1	2
	CO3	2	3	3	2	3	1			1		1	2
5EE7-30	CO-1	3	3	3	2	3	2	1	1	3	2	3	3
	CO-2	3	3	3	2	3	2	1	1	3	2	3	3
	CO-3	3	3	3	3	2	3	3	1	3	2	3	3

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE	Jaipur Engineering college and research centre, Shri Ram ki Nangal, via Sitapura RIICO Jaipur- 302 022.	**Academic year- 2019-2020**

6th Semester Subjects

Subject Code	COs	Program Outcomes (POs)											
		PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
6EE3-01	CO-1	3	2	1	-	-	-	-	-	-	-	-	2
	CO-2	3	2	3	-	-	-	-	-	-	-	-	2
	CO-3	3	2	2	-	-	-	-	-	-	-	-	2
	CO-4	3	3	3	1	-	-	-	-	1	-	1	2
6EE4-02	CO-1	3	2	1	3	1	1	-	-	2	1	1	3
	CO-2	3	3	2	1	2	-	-	-	2	-	1	-
	CO-3	3	3	3	2	1	2	-	-	2	-	2	3
6EE4-03	CO-1	3	3	3	3	-	2	-	-	-	-	2	3
	CO-2	3	2	2	2	-	2	-	-	-	-	1	3
	CO-3	3	2	1	1	-	1	-	-	-	-	2	3
6EE4-04	CO-1	3	3	2	2	2	3	3	3	3	2	2	3
	CO-2	3	3	3	2	2	3	3	3	3	2	2	3
	CO-3	3	2	3	2	3	3	3	2	3	3	3	3
6EE4-05	CO-1	3	2	1	1	1	1	1	1	1	3	1	1
	CO-2	3	1	2	2	2	2	3	1	2	2	2	1
	CO-3	3	2	3	3	3	3	3	2	3	2	3	2
6EE5-13	CO-1	3	3	3	-	-	3	3	2	-	-	-	3
	CO-2	-	-	-	-	3	2	3	1	-	-	-	3
	CO-3	3	3	3	2	2	3	-	-	-	2	3	3
6EE4-21	CO-1	3	3	2	2	3	1	2	1	1	1	1	2
	CO-2	3	3	2	2	3	1	2	1	1	1	1	2
	CO-3	3	3	1	1	3	1	2	1	1	1	1	2
6EE4-22	CO-1	3	3	3	3	3	1	1	2	1	2	2	3
	CO-2	3	2	2	3	3	1	1	2	1	1	1	3
	CO-3	3	1	1	2	3	1	1	1	1	1	1	3
6EE4-23	CO-1	3	3	2	1	2	3	1	1	1	1	3	3
	CO-2	3	3	3	1	2	3	1	1	1	1	3	3
6EE4-24	CO-1	3	3	3	2	3	2	1	-	1	-	1	2
	CO-2	3	3	3	2	3	2	1	-	1	-	1	1
	CO-3	3	3	3	1	3	2	1	-	1	-	1	1

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE	Jaipur Engineering college and research centre, Shri Ram ki Nangal, via Sitapura RIICO Jaipur- 302 022.	**Academic year- 2019-2020**

7th Semester Subjects

Subject Code	COs	Program Outcomes (POs)											
		PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
7EE1A	CO-1	3	3	2	3	3	3	2	-	2	2	2	2
	CO-2	3	3	2	3	3	3	2	-	2	2	2	2
	CO-3	3	3	2	3	3	3	2	-	2	2	2	2
7EE2A	CO-1	2	2	3	2	-	3	3	1	3	3	-	3
	CO-2	3	3	3	2	-	3	3	1	3	3	-	3
	CO-3	2	2	3	2	1	3	2	1	3	3	-	3
7EE3A	CO-1	3	1	2	3	2	1	1	2	1	1	1	1
	CO-2	3	2	3	3	1	1	2	2	3	2	1	2
	CO-3	3	2	3	3	1	1	2	1	2	2	2	1
	CO-4	1	2	1	3	2	1	3	2	1	1	3	3
7EE4A	CO-1	3	2	2	3	2	1	2	3	2	3	1	3
	CO-2	3	3	2	1	3	1	2	1	2	2	1	2
	CO-3	3	2	3	2	2	2	1	2	3	2	3	2
7EE5A	CO-1	3	3	2	3	2	2	2	-	-	-	-	-
	CO-2	3	2	1	-	3	2	-	-	1	-	-	-
	CO-3	3	-	3	-	-	3	3	-	1	-	-	-
7EE6.3A	CO-1	3	2	1	2	1	1	-	-	2	1	1	2
	CO-2	3	3	2	2	2	-	-	-	2	-	1	-
	CO-3	3	3	2	2	1	-	-	-	2	-	2	3
7EE7A	CO-1	3	2	1	1	3	1	-	1	2	1	1	2
	CO-2	3	3	2	2	3	-	1	-	3	1	1	2
	CO-3	3	3	2	2	3	-	-	-	3	2	3	2
7EE8A	CO-1	3	3	3	3	3	1	1	1	2	1	2	3
	CO-2	3	3	3	3	3	1	1	1	2	1	2	3
	CO-3	3	3	3	3	3	1	1	1	2	1	2	2
7EE9A	CO-1	3	2	2	2	1	1	2	2	1	2	3	2
	CO-2	3	2	2	2	1	1	2	2	1	1	3	2
	CO-3	3	2	3	2	1	1	2	2	1	2	3	2
	CO-4	2	2	2	2	1	1	2	2	2	2	3	2
7EETR	CO-1	3	2	1	1	2	2	2	1	1	1	1	2
	CO-2	2	2	2	2	2	3	2	1	1	1	1	2
	CO-3	3	2	2	2	3	3	3	2	1	1	1	2
7EEPR	CO-1	3	3	2	2	2	3	3	3	2	2	2	3
	CO-2	2	3	3	3	3	2	2	2	2	3	2	3
	CO-3	2	2	2	2	2	2	2	3	3	3	3	3

JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTRE	Jaipur Engineering college and research centre, Shri Ram ki Nangal, via Sitapura RIICO Jaipur- 302 022.	**Academic year- 2019-2020**

8th Semester Subjects

Subject Code	COs	Program Outcomes (POs)											
		PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
8EE1A	CO-1	3	3	2	3	2	2	2	-	-	1	-	-
	CO-2	2	2	1	1	2	2	3	-	1	1	-	-
	CO-3	3	2	1	1	-	3	3	-	1	1	-	-
8EE2A	CO-1	3	3	1	2	1	2	-	-	2	1	-	-
	CO-2	3	2	1	1	1	1	-	-	2	1	-	-
	CO-3	2	2	1	1	2	1	-	-	2	1	-	-
8EE3A	CO-1	3	3	3	3	-	2	-	-	-	-	2	3
	CO-2	3	2	2	2	-	2	-	-	-	-	1	3
	CO-3	3	2	2	2	-	2	-	-	-	-	3	3
8EE4.1A	CO-1	3	2	2	3	2	1	2	2	3	2	1	2
	CO-2	3	2	3	1	2	1	1	1	2	2	2	3
	CO-3	3	3	3	2	3	2	2	2	3	2	3	2
8EE5A	CO-1	3	3	2	2	3	1	1	2	1	2	2	3
	CO-2	3	2	2	3	3	1	1	2	1	1	1	3
	CO-3	3	2	1	2	3	1	1	2	1	1	1	3
8EE6A	CO-1	3	3	2	2	3	1	1	2	1	2	2	3
	CO-2	3	2	2	3	3	1	1	2	1	1	1	3
	CO-3	3	2	1	2	3	1	1	2	1	1	1	3
8EE7A	CO-1	3	2	1	1	3	1	-	1	2	1	1	2
	CO-2	3	3	2	2	3	-	1	-	3	1	1	2
	CO-3	3	3	2	2	3	-	-	-	3	2	3	2
8EESM	CO-1	2	2	2	2	2	1	1	1	1	3	1	2
	CO-2	2	2	1	2	2	2	1	1	1	2	1	2
	CO-3	2	2	2	1	1	1	1	1	1	3	1	1
8EEPR	CO-1	3	3	2	2	2	3	3	3	2	2	2	3
	CO-2	2	3	3	3	3	2	2	2	2	3	2	3
	CO-3	2	2	2	2	2	2	2	3	3	3	3	3

MAPPING OF PSO's –CO's

3th Semester Subjects

Subject Code	COs	Program Specific Outcomes (PSOs)	
		PSO-1	PSO-2
3EE2-01	CO-1	-	-
	CO-2	-	-
	CO-3	-	-
	CO-4	-	-
3EE1-02	CO-1	-	-
	CO-2	-	-
	CO-3	-	-
3EE3-04	CO-1	1	2
	CO-2	1	1
	CO-3	1	2
3EE4-05	CO-1	2	1
	CO-2	1	1
	CO-3	1	1
3EE4-06	CO-1	1	1
	CO-2	2	3
	CO-3	2	2
3EE4-07	CO-1	1	1
	CO-2	1	1
	CO-3	1	1
3EE4-08	CO-1	2	1
	CO-2	2	1
	CO-3	2	1
3EE4-21	CO-1	3	3
	CO-2	3	2
	CO-3	2	3
3EE4-22	CO-1	1	1
	CO-2	1	1
	CO-3	1	1
3EE4-23	CO-1	2	1
	CO-2	2	1
	CO-3	2	1
3EE7-30	CO-1	1	1
	CO-2	1	1

4th Semester Subjects

Subject Code	COs	Program Specific Outcomes (PSOs)	
		PSO-1	PSO-2
4EE2-01	CO-1	1	1
	CO-2	1	1
	CO-3	1	1
4EE1-03	CO-1	-	-
	CO-2	-	-
	CO-3	-	-
4EE3-04	CO-1	2	3
	CO-2	2	2
	CO-3	2	2
4EE4-05	CO-1	2	1
	CO-2	3	1
	CO-3	2	1
4EE4-06	CO-1	2	1
	CO-2	2	1
	CO-3	2	1
4EE4-07	CO-1	2	1
	CO-2	2	1
	CO-3	2	1
4EE4-08	CO-1	3	3
	CO-2	2	3
	CO-3	3	2
4EE4-21	CO-1	3	3
	CO-2	2	1
	CO-3	1	3
4EE4-22	CO-1	2	1
	CO-2	2	1
	CO-3	2	1
4EE4-23	CO-1	2	1
	CO-2	2	1
	CO-3	3	1
	CO-4	3	1
4EE3-24	CO-1	3	3
	CO-2	2	2
	CO-3	2	2

5th Semester Subjects

Subject Code	COs	Program Specific Outcomes (PSOs)	
		PSO-1	PSO-2
5EE3-01	CO-1	1	2
	CO-2	1	1
	CO-3	1	3
5EE4-02	CO-1	1	2
	CO-2	2	1
	CO-3	1	1
5EE4-03	CO-1	3	2
	CO-2	3	2
	CO-3	3	2
	CO-4	3	2
5EE4-04	CO-1	3	3
	CO-2	3	3
	CO-3	2	2
5EE4-05	CO-1	1	1
	CO-2	1	1
	CO-3	1	1
5EE5-11	CO-1	3	3
	CO-2	2	2
	CO-3	2	2
5EE4-21	CO-1	1	2
	CO-2	1	1
5EE4-22	CO-1	3	2
	CO-2	2	3
	CO-3	3	3
5EE4-23	CO-1	3	3
	CO-2	3	3
	CO-3	3	3
5EE4-24	CO-1	3	3
	CO-2	2	2
	CO-3	2	2
5EE7-30	CO-1	3	1
	CO-2	3	1
	CO-3	3	1

6th Semester Subjects

Subject Code	COs	Program Specific Outcomes (PSOs)	
		PSO-1	PSO-2
6EE3-01	CO-1	2	2
	CO-2	2	1
	CO-3	3	1
	CO-4	1	1
6EE4-02	CO-1	1	2
	CO-2	1	2
	CO-3	1	2
6EE4-03	CO-1	1	1
	CO-2	1	1
	CO-3	1	1
6EE4-04	CO-1	1	2
	CO-2	1	2
	CO-3	1	3
6EE4-05	CO-1	2	2
	CO-2	3	2
	CO-3	3	2
6EE5-13	CO-1	1	1
	CO-2	2	2
	CO-3	1	1
6EE4-21	CO-1	3	1
	CO-2	3	1
	CO-3	2	1
6EE4-22	CO-1	2	1
	CO-2	2	1
	CO-3	2	1
6EE4-23	CO-1	2	2
	CO-2	2	3
6EE4-24	CO-1	3	1
	CO-2	3	1
	CO-3	3	1

7th Semester Subjects

Subject Code	COs	Program Specific Outcomes (PSOs)	
		PSO-1	PSO-2
7EE1A	CO-1	1	1
	CO-2	1	1
	CO-3	1	2
7EE2A	CO-1	1	2
	CO-2	1	2
	CO-3	1	2
7EE3A	CO-1	2	2
	CO-2	3	1
	CO-3	2	2
	CO-4	2	1
7EE4A	CO-1	3	3
	CO-2	2	3
	CO-3	2	3
7EE5A	CO-1	1	2
	CO-2	1	1
	CO-3	2	2
7EE6.3A	CO-1	1	1
	CO-2	1	1
	CO-3	1	1
7EE7A	CO-1	3	2
	CO-2	3	3
	CO-3	3	3
7EE8A	CO-1	2	2
	CO-2	2	3
	CO-3	2	3
7EE9A	CO-1	2	2
	CO-2	2	2
	CO-3	2	2
	CO-4	2	2
7EETR	CO-1	2	2
	CO-2	2	2
	CO-3	2	2
7EEPR	CO-1	3	3
	CO-2	3	3
	CO-3	3	3

8th Semester Subjects

Subject Code	COs	Program Specific Outcomes (PSOs)	
		PSO-1	PSO-2
8EE1A	CO-1	2	2
	CO-2	1	2
	CO-3	1	2
8EE2A	CO-1	2	2
	CO-2	2	2
	CO-3	2	2
8EE3A	CO-1	1	2
	CO-2	1	1
	CO-3	1	2
8EE4.1A	CO-1	2	1
	CO-2	2	2
	CO-3	3	2
8EE5A	CO-1	2	2
	CO-2	2	3
	CO-3	2	2
8EE6A	CO-1	2	1
	CO-2	2	1
	CO-3	2	1
8EE7A	CO-1	2	3
	CO-2	2	2
	CO-3	3	3
8EESM	CO-1	2	2
	CO-2	2	2
	CO-3	2	2
8EEPR	CO-1	3	3
	CO-2	3	3
	CO-3	3	3