

	Yeshwantrao Chavan College of Engineering, Nagpur
	PO/PSO and CO's of all courses of the UG Programme
	Name of the Department: Electrical Engineering
	Name of the UG Programme: B.E. in Electrical Engineering
	Session 2022-23
	<u>Programme Outcomes (PO)</u>
	Undergraduate engineering programmes are designed to prepare graduates to attain the following program outcomes:
	PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
	PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
	PO3: Design/development of solutions: Design solutions for complex 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.
	PO4: 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.
	PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
	PO6: 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 engineering practice.
	PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
	PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
	PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
	PO10: Communication: Communicate effectively on complex 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.
	PO11: Project management and finance: Demonstrate knowledge and understanding of the 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.
	PO12: 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.
	<u>Programme Specific Outcomes (PSO)</u>
	PSO1: Interpret, identify, analyse and evaluate problems in power system operation, control and design.
	PSO2: Demonstrate knowledge to develop, control and assess electrical and electronic systems.

Second Year: Semester I/II:[illegible]

COURSE OUTCOMES WITH PO MAPPING FOR SESSION 2022-2023

Second Year: Semester III:

Bloom's Level	Course Name: Engineering Mathematics III (T) Course Code: GE2201
CO1	Estimate the Calculus of Numerical Function.
CO2	Determine the transforms and inverse transforms of various functions of variables and
CO3	Discuss the nature of periodic function and express it in terms of series.
CO4	Use appropriate method/s to solve partial differential equations.

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	CO1	2	2												
	CO2	2	2												
	CO3	2	2												
	CO4	2	2												
AVERAGE		2.00	2.00												

Bloom's Level	Course Name: Analog Electronics (T) Course Code: EL2201
L2	CO1 To describe basic analog electronics circuits using various semiconductor devices such as
L4	CO2 To analyse Power Amplifier and Oscillator Circuits using BJT.
L6	CO3 To Design Various Amplifier circuits using BJT and Op-amp.
L3	CO4 To illustrate different circuits using Op-amp for various application.

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	3	3		2	2			2	1	2	2	3		3
L4	CO2	3	3	3	2	1				3					3
L6	CO3	3	3	3	1	1				3		2	1		3
L3	CO4	3	3	3	2	1				3		2			3
AVERAGE		3.00	3.00	3.00	1.75	1.25			2.00	2.50	2.00	2.00	2.00		3.00

Bloom's Level	Course Name: Electronics Engineering Workshop (P) Course Code: EL2202
L2,L3,L5	CO1 Explain the basics of electronic hardware system and to identify the active and passive
L3,L6	CO2 Build hands-on training with familiarization, identification, testing, assembling, and
L6	CO3 Design various systems and develop PCB fabrication skills making use of the various tools
L3	CO4 Make use of Software skills for designing PCB using various tools available in the

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2,L3,L5	CO1	2	1		2					2		3	3	3	3
L3,L6	CO2	2	2	2	3	3				3		3	3	3	3
L6	CO3			2	3	3			1	3		3	3	3	3
L3	CO4			3	2	3			1	3		3	3	3	3
AVERAGE		2.00	1.50	2.33	2.50	3.00			1.00	2.75		3.00	3.00	3.00	3.00

Bloom's Level	Course Name: Electrical Machines (T/P) Course Code: EL2203/EL2204														
L3	CO1	Apply the basic fundamentals of Electromagnetism.													
L4	CO2	Analyze the performance of Transformers.													
L4	CO3	Illustrate proficiency in understanding the performance of D.C. Machines.													
L4	CO4	Evaluate the performance of Induction Motors.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L3	CO1	2	2	2	1	1				2	2		2		
L4	CO2	3	3	3	2	2				2	2		2	3	3
L4	CO3	3	3	3	2	2				2	2		2	1	3
L4	CO4	3	3	3	2	2				2	2		2		3
AVERAGE		2.75	2.75	2.75	1.75	1.75				2.00	2.00		2.00	2.00	3.00

Bloom's Level	Course Name: Network Analysis (T) Course Code: EL2205														
L3	CO1	Apply node voltage and mesh current analysis methods to electric circuits.													
L3	CO2	Apply network theorems to electric circuits.													
L3	CO3	Determine initial and final values of current and voltage of electric circuits containing energy storage elements.													
L3	CO4	Apply Laplace transform to electric circuits.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L4	CO1	3	1	1	1	1			3	3	1		1	3	3
L4,L6	CO2	3	1	1	1	1			3	3	1		1	3	2
L4	CO3	3	1	1	1	1			3	3	1		1	3	1
L4,L6	CO4	3	1	1	1	1			3	3	1		1	3	3
AVERAGE		3.00	1.00	1.00	1.00	1.00			3.00	3.00	1.00		1.00	3.00	2.25

Bloom's Level	Course Name: Computer Programming (P) Course Code: EL2206														
L2	CO1	Explain various programming constructs of SCILAB													
L3	CO2	Develop programs using numerical techniques and circuit analysis learned													
L4	CO3	Analyse and plot the results													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	1	1		1	3			1				3		
L3	CO2	1	1		1	3			1				3	1	
L4	CO3	1	1		1	3			1				3	1	
AVERAGE		1.00	1.00		1.00	3.00			1.00				3.00	1.00	

Bloom's Level	Course Name: Electrical Measurement & Instrumentation (T/P) Course Code: EL2207/EL2208														
L2	CO1	Discuss the working principle of measuring instruments and circuit parameters													
L3	CO2	Explain the concepts of measurement of power and Energy.													
L2	CO3	Illustrate the fact and ideas related to instrument transformer													
L3	CO4	Apply the knowledge of analog and digital instruments with transducers to measure													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	3	3	2	2		2	2	1	2	2	2	2	2	2
L3	CO2	3	3	2	2		2	2	1	2	2	2	2	2	2
L2	CO3	3	3	2	2		2	2	1	2	2	2	2	2	2
L3	CO4	3	3	2	2		2	2	1	2	2	2	2	2	2
AVERAGE		3.00	3.00	2.00	2.00		2.00	2.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00

COURSE OUTCOMES WITH PO MAPPING FOR SESSION 2022-2023

Second Year: Semester IV:

Bloom's Level	Course Name: Advance Mathematical Techniques (T) Course Code: GE2204														
	CO1	Apply numerical techniques to obtain approximate solutions of mathematical equations.													
	CO2	Formulate LPP in Mathematical form and determine the optimal solution of linear													
	CO3	Determine the Statistical parameters for random variables.													
	CO4	Explain the basic concept of fuzzy sets, Relations and fuzzy logic.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	CO1	2	2												
	CO2	2	2	2											
	CO3	2													
	CO4	2	2												
AVERAGE		2.00	2.00	2.00											

Bloom's Level	Course Name: Electrical Machines in Power System (T/P) Course Code: EL2251/EL2252														
L4	CO1	Analyze steady state performance of synchronous machines.													
L3	CO2	Illustrate Synchronization, load sharing and effect of variable excitation in parallel operation of													
L4	CO3	Evaluate the performance of Synchronous machine connected to infinite bus.													
L2	CO4	Describe the transient behavior of Synchronous Machine.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L4	CO1	3	3	3	2	2				2	2		2	3	
L3	CO2	3	3	2	2	2				2	2		2	3	
L4	CO3	3	3	3	3	1				2	2		2	3	
L2	CO4	1	1	2	2	2				2	2		2	3	
AVERAGE		2.50	2.50	2.50	2.25	1.75				2.00	2.00		2.00	3.00	

Bloom's Level	Course Name: Electrical Energy Generation System (T) Course Code: EL2253														
2	CO1	Classify types of renewable energy sources and different factors associated with a generating station													
3	CO2	Explain various parameters related to selection and application of Solar ,wind Energy and Biogas													
4	CO3	Illustrate design parameters for Hydro and Thermal Power generating Systems.													
4	CO4	Explain various parameters related to generation of Nuclear Power													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
2	CO1	2	1	2	1		1	2					1	1	
3	CO2	2	1	2	2	2	1	3					1	1	
4	CO3	2	1	3	2	2	1	2					1	1	
4	CO4	2	1	2	2	2	1	2					1	1	
AVERAGE		2.00	1.00	2.25	1.75	2.00	1.00	2.25					1.00	1.00	

Bloom's Level	Course Name: Renewable Energy System (P) Course Code: EL2254														
L2	CO1	Analyze solar energy for various applications.													
L4	CO2	Evaluate wind energy conversion systems and estimate its parameters.													
L2	CO3	Understand Biomass energy conversion systems.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	2	1	1	1		1	3		3			1	1	
L4	CO2	2	1	1	1		1	3		3			1	1	
L2	CO3	2	1	1	1		1	3		3			1	1	
AVERAGE		2.00	1.00	1.00	1.00		1.00	3.00		3.00			1.00	1.00	

Bloom's Level	Course Name: Electric & Magnetic Fields (T) Course Code: EL2255														
L3	CO1	Apply vector calculus to understand the behavior of static electric fields and static magnetic													
L3	CO2	Apply the Maxwell's equation relating to the electric and magnetic fields and the applications													
L4	CO3	To discriminate the symmetrical and unsymmetrical nature of the problem and the ability to													
L4	CO4	Analyze electromagnetic wave propagation in free-space.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L3	CO1	3	2		2				1				2	1	1
L3	CO2	3	2	2	2	2				1		1	1	1	1
L4	CO3	3	3	2	2	2		1		1		1	1	2	2
L4	CO4	2	3	1	1		1						2	2	2
AVERAGE		2.75	2.50	1.67	1.75	2.00	1.00	1.00	1.00	1.00		1.00	1.50	1.50	1.50

Bloom's Level	Course Name: Electrical Engineering Workshop (P) Course Code: EL2256														
L1	CO1	Understand basic concept of various electrical components													
L2	CO2	Able to explain basic of maintenance and troubleshooting of household equipments, energy													
L3	CO3	An ability to solve hardware engineering problems.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L1	CO1	3	3	3			1	1	1	2	1		3	3	
L2	CO2	3	3	3			1	1	1	2	1		3	3	
L3	CO3	3	3	3			1	1	1	2	1		3	3	
AVERAGE		3.00	3.00	3.00			1.00	1.00	1.00	2.00	1.00		3.00	3.00	

Bloom's Level	Course Name: Microprocessor (T/P) Course Code: EL2257/EL2258														
L2	CO1	Explain types of memory devices and architecture of 8085 microprocessor.													
L2	CO2	Classify the instructions with the help of Addressing modes of 8085 with necessary programs.													
L3	CO3	Apply the knowledge of programming concepts of 8085 for various applications.													
L4	CO4	Analyze the architecture of various Interfacing Devices like 8255 PPI, 8253, ADC and DAC and													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	2	3	1	1				1	2	1		3	2	2
L2	CO2	2	3	2	3	3			1	2	1		3	2	2
L3	CO3	2	3	3	3	3			1	2	1		3	2	3
L4	CO4	2	3	2	3	3			1	2	1		2	2	3
AVERAGE		2.00	3.00	2.00	2.50	3.00			1.00	2.00	1.00		2.75	2.00	2.50

Bloom's Level	Course Name: Signals and Systems (T) Course Code: EL2259														
L2	CO1	Classify mathematical representation of signals and systems in various domains.													
L3	CO2	Determine signals in time and frequency domain using Fourier series and Fourier transform.													
L4	CO3	Analyze the given system in time domain and frequency domain to arrive at valid conclusion.													
L4	CO4	Evaluate various parameter using properties of transform techniques to solve the continuous													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	2	3	1	1								2		1
L3	CO2	3	3	1	1								2		1
L4	CO3	2	3	1	1								2		1
L4	CO4	2	3	2	1								2		1
AVERAGE		2.25	3.00	1.25	1.00								2.00		1.00

COURSE OUTCOMES WITH PO MAPPING FOR SESSION 2022-2023

Third Year: Semester V:

Bloom's	Course Name: Fundamentals of Economics (T) Course Code: GE2312	
L1	CO1	Recognize consumer's behavior and analyze Market price.
L2	CO2	Extrapolate operations in market with production constraints
L3	CO3	Describe the national income accounting and public finance.
L4	CO4	Analyze international trade and institutions.

COURSE ARTICULATION MATRIX (2019-20, 2020-21)

Bloom's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L1	CO1												2		
L2	CO2												2		
L3	CO3							2					2		
L4	CO4												2		
AVERAGE								2.00					2.00		

Bloom's	Course Name: Power Electronics (T/P) Course Code: EL2301/EL2302	
L1	CO1	Identify power semiconductor devices and their use in power converters
L2	CO2	Describe Power semiconductor devices with their turn on/off methods and converter circuits
L3	CO3	Determine the different parameters of commutation, protection of power devices and
L4	CO4	Analyze the performance of converters, chopper and inverter

COURSE ARTICULATION MATRIX

Bloom's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L1	CO1	3	3	2	3	2				1			2	1	
L2	CO2	3	3	2	3	2				1			2	3	
L3	CO3	3	3	2	3	2				1			2	3	2
L4	CO4	3	3	2	3	2				1			2	3	2
AVERAGE		3.00	3.00	2.00	3.00	2.00				1.00			2.00	2.50	2.00

Bloom's	Course Name: Fundamentals of Power System (T) Course Code: EL2303	
L2	CO1	Describe basic components of Power System and per unit values of system components
L3	CO2	Determine the transmission line parameters.
L4	CO3	Explain the types of insulators, underground cables and the performance of system.
L4	CO4	Evaluate the performance of distribution and transmission system.

COURSE ARTICULATION MATRIX

Bloom's		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	3	2	2	3	1	1		1		1		3	3	1
L3	CO2	3	2	2	2	1	1		1		1		3	3	2
L4	CO3	3	3	2	2	1	1		1		1		3	3	2
L4	CO4	3	2	2	3	1	1		1		1		3	3	
AVERAGE		3.00	2.25	2.00	2.50	1.00	1.00		1.00		1.00		3.00	3.00	1.67

Bloom's Level	Course Name: Electrical Drives (T/P) Course Code: EL2304/EL2305														
L2	CO1	Explain the speed-torque characteristics, starting, braking and control of different motors and to select the motor drive for various applications.													
L3	CO2	Identify the size of motor for suitable drive application and motor torque in flywheel effect.													
L4	CO3	Analyze PLC Ladder programming to control electrical drives.													
L4	CO4	Categorize analog and digital speed controls for electrical drives.													

COURSE ARTICULATION MATRIX

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	3	3	2	3	2							3	2	1
L3	CO2	3	3	2	2	2						2	3	2	1
L4	CO3	3	3	3	3	3		3	2			2	3	2	3
L4	CO4	3	3	3	3	3		3	2			1	3	2	3
AVERAGE		3.00	3.00	2.50	2.75	2.50		3.00	2.00			1.67	3.00	2.00	2.00

Bloom's Level	Course Name: OEI: Renewable Energy Generation System (T) Course Code: EL2311														
L2	CO1	Discuss types of renewable energy sources, outline as per Global and Indian context													
L3	CO2	Explain various applications of Solar energy sources and classify types of wind turbine													
L4	CO3	Classify geothermal and biomass energy													
L4	CO4	Compare energy from ocean, tide, wave and hydro for power generation, storage methods for													

COURSE ARTICULATION MATRIX

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1		3						3	2	2		2		1
L3	CO2	1	3						3	2	2		2		1
L4	CO3	2	3						3	2	2		2		1
L4	CO4	2	3						3	2	2		2		
AVERAGE		1.67	3.00						3.00	2.00	2.00		2.00		1.00

Bloom's Level	Course Name: OEI: Electrical Machines and their Applications (T) Course Code: EL2312														
L1	CO1	Recall the basic working of different electrical machine													
L2	CO2	Demonstrate the basic of electric drives.													
L3	CO3	Illustrate the application of different electrical machine													
L4	CO4	Distinguish the different electrical machine used in drives applications													

COURSE ARTICULATION MATRIX

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L1	CO1	2	1		1				1				2	1	1
L2	CO2	2	2		1				1				2	1	1
L3	CO3	3	2	1	2				2		2	2	2	2	2
L4	CO4	2	3	1	1		1		2		2	2	2	2	2
AVERAGE		2.25	2.00	1.00	1.25		1.00		1.50		2.00	2.00	2.00	1.50	1.50

Bloom's Level	Course Name: OEI: Testing and Maintenance of Electrical Machines (T) Course Code: EL2313	
L2	CO1	Classify, the causes of hazards, accidents, shock and the remedial action taken against the
L4	CO2	Conclude different types of tests and the various maintenance techniques to be employed on
L1	CO3	Describe the factors affecting the life of insulation, its testing and maintenance.
L5	CO4	Distinguish the various tests to be conducted on distribution transformer, I. S. Standards.

COURSE ARTICULATION MATRIX

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	1					2	1	3				3		1
L4	CO2	1					2		1				1	2	
L1	CO3	1					2								
L5	CO4	1					1		1				1	2	
AVERAGE		1.00					1.75	1.00	1.67				1.67	2.00	1.00

Bloom's Level	Course Name: OEII: Electrical Energy Audit and Safety (T) Course Code: EL2321	
L2	CO1	Classify, the consumption pattern, conservation of electrical energy and Electricity Act 2001.
L2	CO2	Demonstrate different forms of energy to optimize the use for maximizing the efficiency of
L4	CO3	Examine the proper utilization of energy by energy management and audit.
L4	CO4	Analyze the various Global Environmental Concerns and Electrical safety procedures.

COURSE ARTICULATION MATRIX

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	2	1	1				3	1				1	1	
L2	CO2	2	2					3	1				1	2	
L4	CO3	2	2		3			3	1				1		2
L4	CO4	2	1	3			3	3	1				1		2
AVERAGE		2.00	1.50	2.00	3.00		3.00	3.00	1.00				1.00	1.50	2.00

Bloom's Level	Course Name: OEII: Utilization of Electrical Energy (T) Course Code: EL2322	
L3	CO1	Utilize the concept of electrical engineering for the purpose of heating, welding and
L2	CO2	Explain the concept of cooling and heating and apply the principle for refrigeration and air
L3	CO3	Identify the components of electric traction system and driving cycles.
L3	CO4	Make use of characteristics of generation system and optimum power flow.

COURSE ARTICULATION MATRIX

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L3	CO1	3	3	3								1			
L2	CO2		1	2								1			
L3	CO3	2	1	3	1	1						1		2	2
L3	CO4	3	3	3	1	3		1				1		3	
AVERAGE		2.67	2.00	2.75	1.00	2.00		1.00				1.00		2.50	2.00

Bloom's Level	Course Name: OEII: Power System Engineering (T) Course Code: EL2323	
L2	CO1	Interpret & Outline types of load and power system concepts required to engineering problems.
L2	CO2	Develop the ability to implement the appropriate safety equipments for design of electrical power system which relate the enhancing the efficiency of the transmission and distribution system with environment friendly technology.
L3	CO3	Formulate & Solve A.C and D.C distribution networks for necessary variable calculation.
L4	CO4	Ability to design and analyze switchgear protection system with respect to various electrical parameters which show the required substation parameters.

COURSE ARTICULATION MATRIX

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	3	3	2	2							3		2	
L2	CO2	3	3	2	2							3		2	
L3	CO3	3	3	2	2							3		2	
L4	CO4	3	3	2	2							3		2	
AVERAGE		3.00	3.00	2.00	2.00							3.00		2.00	

Third Year: Semester VI:

Bloom's Level	Course Name: Fundamentals of Management (T) Course Code: GE2311	
	L3	CO1 Interpret Legal provision and various Principles of Management
	L2	CO2 Classify the working of Human Resource and Financial Management in the organization.
	L2	CO3 Illustrate the Procedure and methods of Project Management
	L2	CO4 Analyse techniques of marketing of goods and services

Course Matrix (CO PO Mapping Table)

Course Matrix (CO-PO Mapping Table)															
Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L3	CO1									2		2	2		
L2	CO2									2		2	2		
L2	CO3									2		2	2		
L2	CO4									3		3	3		
AVERAGE										2.25		2.25	2.25		

Bloom's Level	Course Name: Control System (T/P) Course Code: EL2351/EL2352	
L2	CO1	Classify control systems, transfer function of the system with electrical and Mechanical systems
L3	CO2	Illustrate the time response of the system
L4	CO3	Analyze stability using transfer function and state variable approach.
L5	CO4	Estimate parameters using root locus and frequency domain methods.

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	3	3	1	2	2				2	1		1	2	2
L3	CO2	3	3	1	2	3				2	1		1	2	2
L4	CO3	3	3	2	2	3	1			2	1		2	2	2
L5	CO4	3	3	2	2	3	1			2	1		2	2	3
AVERAGE		3.00	3.00	1.50	2.00	2.75	1.00			2.00	1.00		1.50	2.00	2.25

Bloom's Level	Course Name: Power System Analysis (T) Course Code: EL2353	
L3	CO1	Apply symmetrical components concepts in fault analysis
L4	CO2	Analyse different faults in power system
L4	CO3	Evaluate stability and economic operation of power system
L2	CO4	Differentiate different neutral grounding and compensation systems

Course Matrix (CO PO Mapping Table)

[illegible]

Bloom's Level	Course Name: Simulation of Power Electronics & Power System (P) Course Code: EL2354														
L3	CO1	SIMULATE THE VARIOUS POWER PROCESSING CIRCUITS SUCH AS CONVERTERS,DC/DC													
L3	CO2	DEVELOP SIMULATION circuit to quantify the performance of short, medium and long													
L4	CO3	ANALYSE the performance of processing circuits and transmission line													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L3	CO1	2	2	1	1	3								1	1
L3	CO2	2	2	1	1	3								1	1
L4	CO3	2	2	1	1	3								1	1
AVERAGE		2.00	2.00	1.00	1.00	3.00								1.00	1.00

Bloom's Level	Course Name: Substation Design (P) Course Code: EL2355														
L2	CO1	Explain single line diagram of substation with rating of different equipments, types of relays													
L3	CO2	Illustrate plan of equipments and panels mounted in a substation.													
L4	CO3	Analyze earthing system of substation.													
L6	CO4	Design of substation complete in regards to selection of equipments, sizes, protective													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	3	2	3	1		2	1	1	1	2		2	2	1
L3	CO2	3	2	2	1		1	1	1	1	2		2	2	1
L4	CO3	3	3	3	2		1	1	1	1	3		2	2	1
L6	CO4	3	3	3	2		1	1	1	1	3		2	2	1
AVERAGE		3.00	2.50	2.75	1.50		1.25	1.00	1.00	1.00	2.50		2.00	2.00	1.00

Bloom's Level	Course Name: PEI: Advanced Power Electronics (T) Course Code: EL2361														
	CO1	Identify and recall various power semiconductor devices and their effects produced in													
	CO2	Explain and compare various power electronic converters and inverters used for various													
	CO3	Apply knowledge of modulation techniques to various converters													
	CO4	Demonstrate knowledge related to effects of harmonics, their measurement and elimination													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	CO1	3			1				1				1	1	
	CO2	3	2	2	1				1				1	2	
	CO3	3	2	2	1	1			1				1	2	1
	CO4	3	2	2	1	1			1				1		1
AVERAGE		3.00	2.00	2.00	1.00	1.00			1.00				1.00	1.67	1.00

Bloom's Level	Course Name: PEI: Electrical Distribution in Power System (T) Course Code: EL2362														
L2	CO1	Illustrate various components in distribution System network.													
L3	CO2	Calculate voltage drop, reactive power compensation, power loss, fault current for													
L5	CO3	Recommend substation type, earthing methods and tariff structures.													
L5	CO4	Consider distribution systems for distribution automation and SCADA.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	2												1	
L3	CO2	3	2	2			2		1				1	3	
L5	CO3	2	2	3	2	2					1			2	
L5	CO4	2	2	2	2	3								1	
AVERAGE		2.25	2.00	2.33	2.00	2.50	2.00		1.00		1.00		1.00	1.75	

Bloom's Level	Course Name: PEI: Illumination Engineering (MOOC) (T) Course Code: EL2363														
L2	CO1	Identify the criteria for the selection of lamps and lighting systems for an indoor or outdoor													
L3	CO2	Explain the different parameters in designing an illumination system for a particular													
L3	CO3	Apply different illumination systems for different applications.													
L4	CO4	Devise proper illumination model for a specific application.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	1	2			3							3	3	2
L3	CO2	3		3	1						3			2	2
L3	CO3	3	2	3	3	3	2					2			2
L4	CO4	3	3	3		3	2					3		3	3
AVERAGE		2.50	2.33	3.00	2.00	3.00	2.00				3.00	2.50	3.00	2.67	2.25

Bloom's Level	Course Name: PEI: Electric Vehicles (T) Course Code: EL2364														
L3	CO1	Apply the concept of dynamics to size the electric powertrain													
L2	CO2	Identify the different energy and power sources and utilize their characteristics for Electric													
L4	CO3	Analyze the speed torque characteristics of traction motors and their operation													
L3	CO4	Illustrate the HEV architecture, powertrain, sizing and their operation													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L3	CO1	3	3	3	3	1		2					2	1	
L2	CO2	3	3	3	2	1		2					2	3	3
L4	CO3	3	3	3	2	1	2						2	3	3
L3	CO4	3	3	3	2	1	2						2	2	1
AVERAGE		3.00	3.00	3.00	2.25	1.00	2.00	2.00					2.00	2.25	2.33

Bloom's Level	Course Name: PEI: Electric Power Utilization (T) Course Code: EL2365														
L2	CO1	Identify utilization of electrical power with respect to heating and welding													
L2	CO2	Illustrate illumination from technical point of view													
L3	CO3	Explain different refrigeration systems for various application													
L4	CO4	Evaluate various types of fans, pumps, compressor and dg sets along with their application and their performance													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	2	1	2								2	1		1
L2	CO2	2	1	1								1	1		1
L3	CO3	2	2	2								1	2		2
L4	CO4	2	2	3								1	2		2
AVERAGE		2.00	1.50	2.00								1.25	1.50		1.50

Bloom's Level	Course Name: OEIII: Renewable Energy Generation System (T) Course Code: EL2371														
L2	CO1	Discuss types of renewable energy sources, outline as per Global and Indian context													
L3	CO2	Explain various applications of Solar energy sources and classify types of wind turbine													
L4	CO3	Classify geothermal and biomass energy													
L4	CO4	Compare energy from ocean, tide, wave and hydro for power generation, storage methods													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1		3						3	2	2		2		1
L3	CO2	1	3						3	2	2		2		1
L4	CO3	2	3						3	2	2		2		1
L4	CO4	2	3						3	2	2		2		
AVERAGE		1.67	3.00						3.00	2.00	2.00		2.00		1.00

Bloom's Level	Course Name: OEIII: Electrical Machines and their Applications (T) Course Code: EL2372														
L1	CO1	Recall the basic working of different electrical machine													
L2	CO2	Demonstrate the basic of electric drives.													
L3	CO3	Illustrate the application of different electrical machine													
L4	CO4	Distinguish the different electrical machine used in drives applications													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L1	CO1	2	1		1				1				2	1	1
L2	CO2	2	2		1				1				2	1	1
L3	CO3	3	2	1	2				2		2	2	2	2	2
L4	CO4	2	3	1	1		1		2		2	2	2	2	2
AVERAGE		2.25	2.00	1.00	1.25		1.00		1.50		2.00	2.00	2.00	1.50	1.50

Bloom's Level	Course Name: OEIII: Testing and Maintenance of Electrical Machines (T) Course Code: EL2373														
L2	CO1	Classify, the causes of hazards, accidents, shock and the remedial action taken against the													
L4	CO2	Conclude different types of tests and the various maintenance techniques to be employed													
L1	CO3	Describe the factors affecting the life of insulation, its testing and maintenance.													
L5	CO4	Distinguish the various tests to be conducted on distribution transformer, I. S. Standards.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	1					2	1	3				3		1
L4	CO2	1					2		1				1	2	
L1	CO3	1					2								
L5	CO4	1					1		1				1	2	
AVERAGE		1.00					1.75	1.00	1.67				1.67	2.00	1.00

Bloom's Level	Course Name: OEIV: Electrical Energy Audit and Safety (T) Course Code: EL2381														
L2	CO1	Classify, the consumption pattern, conservation of electrical energy and Electricity Act 2001.													
L2	CO2	Demonstrate different forms of energy to optimize the use for maximizing the efficiency of													
L4	CO3	Examine the proper utilization of energy by energy management and audit.													
L4	CO4	Analyze the various Global Environmental Concerns and Electrical safety procedures.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	2	1	1				3	1				1	1	
L2	CO2	2	2					3	1				1	2	
L4	CO3	2	2		3			3	1				1		2
L4	CO4	2	1	3			3	3	1				1		2
AVERAGE		2.00	1.50	2.00	3.00		3.00	3.00	1.00				1.00	1.50	2.00

Bloom's Level	Course Name: OEIV: Utilization of Electrical Energy (T) Course Code: EL2382														
L3	CO1	Utilize the concept of electrical engineering for the purpose of heating, welding and													
L2	CO2	Explain the concept of cooling and heating and apply the principle for refrigeration and air													
L3	CO3	Identify the components of electric traction system and driving cycles.													
L3	CO4	Make use of characteristics of generation system and optimum power flow.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L3	CO1	3	3	3								1			
L2	CO2		1	2								1			
L3	CO3	2	1	3	1	1						1		2	2
L3	CO4	3	3	3	1	3		1				1		3	
AVERAGE		2.67	2.00	2.75	1.00	2.00		1.00				1.00		2.50	2.00

Bloom's Level	Course Name: OEIV: Power System Engineering (T) Course Code: EL2383	
L1	CO1	Articulate types of load and power system concepts required to engineering problems.
L2	CO2	Develop the ability to implement the appropriate safety equipment for design of electrical
L2	CO3	Formulate A.C and D.C distribution networks for necessary variable calculation.
L3	CO4	Ability to design and analyze switchgear protection system with respect to various electrical

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L1	CO1	2	0	0		1		1			1	0	0	1	
L2	CO2	1	2	1		0		1			0	1	1	2	
L2	CO3	2	1	0		0		1			0	0	0	2	
L3	CO4	1	1	2		0		1			1	0	0	1	
AVERAGE		1.50	1.00	0.75		0.25		1.00			0.50	0.25	0.25	1.50	

Bloom's Level	Course Name: OEIV: Power System Engineering (T) Course Code: EL2383	
L2	CO1	Interpret & Outline types of load and power system concepts required to engineering
L2	CO2	Develop the ability to implement the appropriate safety equipments for design of electrical power system which relate the enhancing the efficiency of the transmission and distribution system with environment friendly technology.
L3	CO3	Formulate & Solve A.C and D.C distribution networks for necessary variable calculation.
L4	CO4	Ability to design and analyze switchgear protection system with respect to various electrical parameters which show the required substation parameters.

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	3	3	2	2							3		2	
L2	CO2	3	3	2	2							3		2	
L3	CO3	3	3	2	2							3		2	
L4	CO4	3	3	2	2							3		2	
AVERAGE		3.00	3.00	2.00	2.00							3.00		2.00	

COURSE OUTCOMES WITH PO MAPPING FOR SESSION 2022-2023

Fourth Year: Semester VII:

Bloom's Level	Course Name: Switchgear and Protection (T/P) Course Code: EL2401 /EL2402														
L2	CO1	Explain the various basic principles of protection system													
L3	CO2	Apply overcurrent protection Principle													
L3	CO3	Solve the problems on distance protection.													
L2	CO4	Explain the types of circuit breaker													
L5	CO5	Explain the protection used for Equipment's Protection													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	1						1							
L3	CO2	2	2	2	1		1	1		2		1	1	2	1
L3	CO3	2	2	2	1			1		2		1	1	2	1
L2	CO4	2		1			1	1	1	2	1		1	2	
L5	CO5	2	2	2				1		1		1	1	2	1
AVERAGE		2.00	2.00	1.75	1.00		1.00	1.00	1.00	1.75	1.00	1.00	1.00	2.00	1.00

Bloom's Level	Course Name: High Voltage Engineering (T/P) Course Code: EL2403/EL2404														
L2	CO1	Explain various breakdown mechanism and overvoltages													
L3	CO2	Determine propagation of travelling waves along with insulation coordination													
L4	CO3	Analyse generation and measurement of high voltage and current.													
L4	CO4	Illustrate Non-destructive and high voltage testing of electrical apparatus													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	3	3	1	1						1	2	2		2
L3	CO2	3	3	2	2						1	1	2		2
L4	CO3	3	3	3	2						1	2	2		2
L4	CO4	3	3	3	2						1	2	2		2
AVERAGE		3.00	3.00	2.25	1.75						1.00	1.75	2.00		2.00

Bloom's Level	Course Name: PE II : Fundamentals of Power Quality (T) Course Code: EL2411														
L1	CO1	Describe the power quality disturbances, causes, effects and their solutions.													
L2	CO2	Interpret the various types of the voltage sags.													
L3	CO3	Determine the voltage sag magnitude and the impact of the harmonics on supply quality.													
L4	CO4	Plan the suitable solution such as filters and custom power devices etc. to mitigate or eliminate the power quality problems.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L1	CO1	3							1				1	3	
L2	CO2	3	2	1	2				1				1	3	
L3	CO3	3	2	1	2				1				1	3	2
L4	CO4	3	2	1	2				1				1	3	2
AVERAGE		3.00	2.00	1.00	2.00				1.00				1.00	3.00	2.00

Bloom's Level	Course name: PE II:Electrical Installtion Design(EL2412)														
L2	CO1	Classify the techniques used to identify the load pattern													
L2	CO2	Explain various types of wires, cables used in distribution systems and their tests													
L3	CO3	Identify different types of luminaries and develop calculation skills.													
L4	CO4	Analyze various components involved in substation and their function.													

Program Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	3	3	3	2	1	1	3	2	2	2	2	3	2	2
L2	CO2	3	3	3	2	1	1	3	2	2	2	2	3	2	2
L3	CO3	3	3	3	2	1	1	3	2	2	2	2	3	2	2
L4	CO4	3	3	3	2	1	1	3	2	2	2	2	3	2	2
AVERAGE		3.00	3.00	3.00	2.00	1.00	1.00	3.00	2.00	2.00	2.00	2.00	3.00	2.00	2.00

Bloom's Level	Course name: PE II: Electrical Machine Design Course Code: EL2413														
L2	CO1	Classify various materials used in construction of electrical machines and find their rating and performance													
L3	CO2	Determine the design parameters of transformer													
L3	CO3	Compute stator, rotor design dimensions of induction motor													
L4	CO4	Evaluate the designed parameters of synchronous machine.													

Program Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	3	2	1	1	1		1	1	1	1		1	1	
L3	CO2	3	2	2	2	1		1	1	1	1		1	2	
L3	CO3	3	2	2	2	1		1	1	1	1		1	2	
L4	CO4	3	2	2	2	1		1	1	1	1		1	3	
AVERAGE		3.00	2.00	1.75	1.75	1.00		1.00	1.00	1.00	1.00		1.00	2.00	

Bloom's Level	Course Name: PE II: Power System Operation and Control (T) Course Code: EL2421														
L3	CO1	To calculate various factors & reserve requirement for economic aspects of power system.													
L4	CO2	Evaluate optimal unit committment ,load forecasting problem & optimal scheduling of generating													
L3	CO3	Explain the concept of Single area load frequency control.													
L3	CO4	Write various methods of voltage control,reactive power compensation													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	CO1	3	2	2									3	3	
	CO2	3	2	2									3	3	
	CO3	3	1	1									1	1	
	CO4	3	2	2									1	1	
AVERAGE		3.00	1.75	1.75									2.00	2.00	

Bloom's Level	Course Name: PE III: FACTS Devices (T) Course Code: EL2422														
1	CO1	Understand FACTS Concept, various FACTS Controllers, its classification and explain its applications													
3	CO2	Apply different shunt and series compensators and its control schemes													
3	CO3	Analyze voltage and phase angle regulators in power system													
	CO4	Analyse the FACTS concept using combine series-shunt and series-series controller to evaluate the													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	CO1	2	2		2									1	
	CO2	2	3											2	1
	CO3	3	3	3	2									2	1
	CO4	3	3	3	2	2								2	1
AVERAGE		2.50	2.75	3.00	2.00	2.00								1.75	1.00

Bloom's Level	Course name: PEIII: Electrical Energy Management and Audit Course Code: EL2423														
L1	CO1	Describe, the energy sources, methods of energy conservation and its pattern, electricity act 2003													
L2	CO2	Interpret different forms of electrical and thermal energy.													
L2	CO3	Estimate the Energy Management, Energy Audit, Energy Monitoring and Targeting.													
L3	CO4	Determine the various Global Environmental Concerns and Electrical safety procedures.													

Program Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L1	CO1	3	3	3	3				1				1		2
L2	CO2	3	3	3	3				1				1		2
L2	CO3	3	3	3	3				1				1		2
L3	CO4	3	3	3	3				1				1		2
AVERAGE		3.00	3.00	3.00	3.00				1.00				1.00		2.00

Bloom's Level	Course Name: PE III: Advanced Control System (T) Course Code: EL2424														
L2	CO1	Describe lag and lead compensator and PI, PD and PID control in time domain and frequency domain													
L3	CO2	Determine state variable matrix with solution of state models and concepts of controllability,													
L4	CO3	Analyze non-Linear Control System, types of non-linearities, its characteristics and method for													
L4	CO4	Explain sample data control system, Stability analysis with Z-transforms and solution of discrete													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L2	CO1	3	2	3	2	1			1				1	2	
L3	CO2	3	2	3	2	1			1				1		
L4	CO3	3	2	3	2	1			1				1		
L4	CO4	3	2	3	2	1			1				1		2
AVERAGE		3.00	2.00	3.00	2.00	1.00			1.00				1.00	2.00	2.00

L3	CO1	Build and construct different types of Matrices using graph theory, Apply different methods to Build & Develop the A, B, C, K, Impedance and admittance Matrices
L3	CO2	Make use of different methods and Analyze Load Flow studies
L5	CO3	Determine the fault current and voltages for different types of faults by using Zbus
L3	CO4	Make use of different methods for Transient Stability Studies

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L3	CO1	1	1					1							
L3	CO2	1	2	2				1		1		1	1	2	1
L5	CO3	1	2	2			1	1		1		1	1	2	1
L3	CO4	1	1	1			1	1					1	2	
AVERAGE		1.00	1.50	1.67			1.00	1.00		1.00		1.00	1.00	2.00	1.00

Bloom's Level	Course Name: PE IV: EHVAC-HVDC Transmission (T) Course Code: EL2434														
L4	CO1	Analyse Power handling capacity of EHVAC Transmission systems.													
L2	CO2	Explain Corona, the concept of Electrostatic and electromagnetics, Electrical safety.													
L2	CO3	Classify HVDC Transmission system , Analyse the methods of HVDC Control.													
L6	CO4	Design of Harmonic filters and reactive power configuration, HVDC Circuit breaker and Types and													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L4	CO1	3	2	1									1	1	
L2	CO2	3	2				3						1		
L2	CO3	2	3										1		
L6	CO4	3	2	2									1		1
AVERAGE		2.75	2.25	1.50			3.00						1.00	1.00	1.00

Bloom's Level	Course Name: Mini Project (P) Course Code: EL2409														
L1	CO1	Identify the research area of project work in Electrical Engineering.													
L2,L6	CO2	Summarize the literature review in the area identified, propose the objectives of project work.													
L3,L4	CO3	Organize requisite components with specifications for the project software/hardware prototype													
L2,L5,L6	CO4	Compile project work to prepare a thesis report and present a research paper on project													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L1	CO1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
L2,L6	CO2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
L3,L4	CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
L2,L5,L6	CO4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
AVERAGE		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Bloom's Level	Course Name: Campus Recrutment Training (CRT) (P) Course Code: EL2410														
L3	CO1	Analytical skill improvement of logical reasoning for professional responsibilities.													
L6	CO2	Develop communication, overall personality.													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
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L3	CO1	1	2						1	2				2	
L6	CO2										2			1	
AVERAGE		1.00	2.00						1.00	2.00	2.00			1.50	

COURSE OUTCOMES WITH PO MAPPING FOR SESSION 2022-2023

Fourth Year: Semester VIII:

Bloom's Level	Course Name: Major Project Course Code: EL2451														
L1	CO1	Identify the research area of project work in Electrical Engineering.													
L2,L6	CO2	Summarize the literature review in the area identified, propose the objectives of project work.													
L3,L4	CO3	Organize requisite components with specifications for the project software/hardware prototype and													
L2,L5,L6	CO4	Compile project work to prepare a thesis report and present a research paper on project													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L1	CO1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
L2,L6	CO2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
L3,L4	CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
L2,L5,L6	CO4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
AVERAGE		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

Bloom's Level	Course Name: Extra curricular Activity Evaluation Course Code: EL2452														
L3	CO1	Build his/her hobbies and interests													
L6	CO2	Discuss and work in team													
L6	CO3	Develop the sense of responsibility													

Course Matrix (CO PO Mapping Table)

Bloom's Level		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
L3	CO1						1						3		
L6	CO2						2			3	3	3			
L6	CO3						3		3				3		
AVERAGE							2.00		3.00	3.00	3.00	3.00	3.00		