

*Department of*  
*EEE*

*CO PO MAPPING*  
*2022-23 (Odd Semester)*





# RAJIV GANDHI COLLEGE OF ENGINEERING AND TECHNOLOGY

Pondy-Cuddalore Main Road, Kirumampakkam, Puducherry – 607 403.

Affiliated to Pondicherry University and Approved by AICTE, New Delhi

## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2022-23 (Odd Semester)

### COURSE OBJECTIVES

MA-T31 MATHEMATICS-III [Total no. of. Students: 10] [2<sup>nd</sup> Year, 3<sup>rd</sup> Semester]

**Course Prerequisite:** Basic knowledge for formulas differentiation and integration.

#### Course Objective:

1. To provide the concepts of functions of a complex variable, conformal mapping, complex integration, series expansion of complex functions, Harmonic analysis and Fourier series.
2. To make the students understand and work out problems of constructing analytic functions, conformal mapping, bilinear transformation, contour integration and expanding functions into Fourier series including Harmonic analysis.

### COURSE OBJECTIVES

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	To understand the concepts of function of a complex variable and complex integration.	L2
CO2	To apply these ideas to solve problems occurring in the area of Engineering and Technology.	L2
CO3	To Expand functions into Fourier series which are very much essential for in Engineering and Technology.	L2
CO4	To apply these ideas to solve problems occurring in the area of Engineering and Technology.	L3
CO5	To Obtain Fourier transform for the functions which are needed for solving application problems.	L3

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage	PSO2	Problem Solving Skills
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics	PSO3	Computing and Research Ability
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	3	2	–	–	2	–	3	–	–	2	2	3	2
CO2	3	3	3	2	–	–	2	–	2	–	–	2	3	3	2
CO3	3	3	2	3	1	–	2	3	3	–	–	3	3	3	2
CO4	3	3	3	3	–	–	2	–	2	–	–	1	1	1	1
C05	3	3	3	3	1	1	2	3	3	–	–	3	3	3	1
AVG	3	3	2.8	2.6	0.4	0.2	2	1.2	2.6	–	–	2.4	2.4	2.6	1.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EET-T32 ELECTRIC CIRCUIT ANALYSIS [Total no. of. Students: 10] [2<sup>nd</sup> Year, 3<sup>rd</sup> Semester]

**Course Prerequisite:** Basic knowledge on Electrical Circuit and the coupled circuits are analyzed.

### Course Objective:

1. To understand the fundamental principles of circuit theory.
2. To draw the Fundamentals of graph theory such as incidence matrix, reduced incidence matrix, tie set and cut set matrix are introduced.
3. To analyze three phase circuits
4. To understand Concept of resonance is dealt in detail and the coupled circuits are analyzed.
5. To understand the concept of transient response of RL, RC and RLC circuits to DC and AC excitation.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Solve the circuits using mesh and nodal analysis DC & AC circuit theorems.	L3
CO2	Deduce the complicated circuits into simple circuits using theorems.	L3
CO3	Understand the concept of network topology and three phase circuits.	L2
CO4	Understand the concept of resonant theory and coupled circuits.	L2
CO5	Solve the RL, RLC Transient circuits with DC & AC inputs.	L3

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes			
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems		
PO2	Problem analysis				
PO3	Design/development of solutions				
PO4	Conduct investigations of complex problems				
PO5	Modern tool usage				
PO6	The engineer and society				
PO7	Environment and sustainability				
PO8	Ethics				
PO9	Individual and team work			PSO2	Problem Solving Skills
PO10	Communication				
PO11	Project management and finance				
PO12	Life-long learning			PSO3	Computing and Research Ability







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	2	2	3	–	2	–	–	–	–	2	2	3	2
CO2	3	3	2	3	3	–	–	–	–	–	–	–	3	3	2
CO3	3	3	2	3	2	–	2	–	–	–	–	–	3	3	2
CO4	3	3	3	2	–	–	2	–	–	–	–	–	3	2	1
CO5	3	3	3	–	2	–	–	–	3	–	–	–	3	3	1
AVG	3	3	2.4	2	2	–	2	–	0.6	–	–	0.4	2.8	2.8	1.6



  
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T33 – ELECTRICAL MACHINES I [Total no. of. Students: 10] [2ndYear, 3<sup>rd</sup> Semester]

**Course Prerequisite:** Knowledge about transformer, elementary concept of rotating machine.

### Course objective:

1. To understand and evaluate the performance of power and distribution transformers and special transformers.
2. To understand the basic concepts of electromechanical energy conservation through energy and co-energy.
3. To understand the working of energy conversion machines namely motor and generator and various methods to control its speed.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understand the simple Magnetic circuit calculation in electrical machine.	L2
CO2	Understand the elementary concept of Rotating Machine.	L2
CO3	Understand the Characteristics of each Rotating machine & different type of test performed to find efficiency.	L2
CO4	Understand the principle of construction detail of transformer.	L2
CO5	Understand the operation of poly phase transformer & special transformer.	L2

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance	PSO2	Problem Solving Skills
PO12	Life-long learning		
		PSO3	Computing and Research Ability





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
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CO2	3	3	-	3	1	-	-	-	-	-	-	-	3	2	1
CO3	3	3	3	3	2	-	-	-	-	-	-	-	2	3	2
CO4	3	2	3	3	-	-	-	-	1	-	-	-	3	2	1
C05	3	3	3	-	2	1	1	-	2	-	-	-	2	3	2
AVG	3	2.8	1.2	1.2	1.5	0.2	0.4	0	1.5	0	0	0.4	2.4	2.6	1.6



  
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T34- ELECTRONIC DEVICES AND CIRCUITS [Total no. of Students: 10] [2<sup>nd</sup> Year, 3<sup>rd</sup> Semester]

**Course Prerequisite:** Knowledge on various electronic devices like diodes, transistors

#### Course Objective:

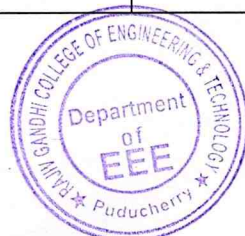
1. To understand the various electronic devices like diodes, transistors, FET, MOSFET, DIAC and Triac
2. To understanding the operation of these devices and their characteristic curves
3. To understand basic applications like rectifier circuits, filters, voltage regulator.
4. To Understand the fundamental concepts of power electronic devices
5. To prepares them comprehensively for electronic circuit analysis to be dealt in future.

#### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Acquire a comprehensive understanding of semiconductor materials, PN junctions	L2
CO2	Proficiency in analyzing and designing electronic circuits using semiconductor devices. This includes understanding small-signal models, biasing techniques, signal amplification, and frequency response.	L4
CO3	Gain a comprehensive understanding of semiconductor materials, PN junctions, and the operating principles of diodes, BJTs, and FETs.	L4
CO4	Gain knowledge about power devices, rectifiers and power supplies	L2
CO5	To understand the Principle of operation and characteristics special two-terminal devices	L2

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	–	2	–	–	1	–	–	–	–	2	2	2	2
CO2	3	3	–	3	–	–	–	–	–	–	–	–	2	2	1
CO3	3	3	3	3	2	1	–	–	–	–	–	–	2	2	2
CO4	3	2	3	3	2	–	–	–	1	–	–	–	3	3	1
C05	3	3	3	–	2	2	1	–	2	–	–	–	3	3	2
AVG	3	2.8	1.8	2.2	1.2	0.6	0.4	–	0.6	–	–	0.4	2.4	2.4	1.6



  
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T35 ELECTROMAGNETIC THEORY [Total no. of. Students: 10] [2nd Year, 3rd Semester]

**Course Prerequisite:** Knowledge of Coordinate System and Electromagnetic Waves

### Course Objective:

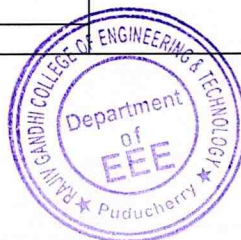
1. To investigate the physics of electric and magnetic fields.
2. To demonstrate the unification of electrostatic and magneto-static fields as a time varying electromagnetic fields.
3. To develop the Maxwell's equations and also explores the fundamental so wave propagation in different mediums.
4. To explore the electrostatic applications and will be able to solve problems with medium of different boundaries.
5. To apply concepts of Wave reflection and refraction, Smith Chart in practical Field

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Differentiate different types of coordinate systems and use them for solving the problems of electromagnetic field theory.	L2
CO2	Describe static electric and magnetic fields, their behavior in different media, associated laws, boundary conditions and electromagnetic potentials.	L2
CO3	Solve the integral and point form of Maxwell's equations	L2
CO4	Describe time varying fields, propagation of electromagnetic waves in different media, pyonting theorem, their sources & effects and to apply the theory of electromagnetic waves in practical problems.	L3
CO5	Apply concepts of Wave reflection and refraction, Smith Chart in practical Field.	L3

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO3	Computing and Research Ability







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	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
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CO2	3	3	2	3	2	-	-	-	-	-	-	-	-	1	2
CO3	3	2	1	2	2	-	-	-	-	-	-	-	-	1	2
CO4	3	2	2	3	2	-	-	-	-	-	-	-	-	1	2
CO5	3	3	3	3	3	-	-	-	-	-	-	-	-	1	2
AVG	3	2.4	1.8	2.8	2.4	-	-	-	-	-	-	-	-	1	2



  
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T36- FLUID AND THERMAL MACHINES [Total no. of Students: 10] [2<sup>nd</sup> Year, 3<sup>rd</sup> Semester]

**Course Prerequisite:** Knowledge on principles of fluid mechanics, measurement of parameters of fluids

### Course Objective:

1. To understand about hydraulic machines like the hydraulic turbines which drive electric generators and the hydraulic pumps which are driven by electric motors
2. To Know about hydraulic machines like the hydraulic turbines which drive electric generators and the hydraulic pumps which are driven by electric motors
3. To calculate the cycle efficiencies for the above mentioned power plants
4. Calculate the fluid properties, fluid flow rates, comprehend the differences between various types of hydraulic machines,
5. To understand the operation of various power plants and calculate their efficiency.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understanding of fundamental principles in fluid mechanics, including fluid properties, fluid statics, fluid dynamics, and the application of conservation laws.	L2
CO2	Ability to analyze and design thermal systems including heat exchangers, boilers, turbines, and compressors, considering efficiency, performance, and environmental impact.	L4
CO3	Ability to analyze and design thermal systems including heat exchangers, turbines, and compressors, considering efficiency, performance, and environmental impact.	L4
CO4	Proficiency in applying thermodynamic principles to analyze energy conversion processes, such as power cycles, refrigeration cycles, and their components.	L4
CO5	Capability to evaluate the performance characteristics of fluid machines like pumps, gas turbines and air compressors, and their applications in engineering systems.	L5

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
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	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	–	1	–	–	–	–	–	–	–	2	2	2	2
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CO3	3	3	3	1	–	–	–	–	–	–	–	2	2	2	2
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C05	3	3	3	–	–	–	–	–	2	–	–	3	3	3	2
AVG	3	2.8	1.8	1.2	–	–	–	–	0.6	–	–	2.2	2.4	2.4	1.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE P32- ELECTRICAL MACHINE LAB – I [Total no. of Students: 10] [2<sup>nd</sup> Year, 3<sup>rd</sup> Semester]

**Course Prerequisite:** Knowledge about the performance characteristics of the given DC motors from the test data operation and load sharing of single-phase transformers.

Course Objectives:

1. To determine the internal and external characteristics of the given DC generators from the test data
2. To determine or predetermine the performance characteristics of the given DC motors from the test data.
3. To determine or predetermine the regulation and efficiency of the single-phase transformers from the test data
4. To determine the regulation and efficiency of the three phase transformers from the test data
5. To understand the parallel operation and load sharing of single-phase transformers.

Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Analyze the performance of any DC machine (shunt, series or compound) and transformer by conducting suitable experiments and report the results	L4
CO2	Predetermine the different performance characteristics of DC machines and transformers	L4
CO3	Analyze the various speed control techniques for DC motors.	L4
CO4	Experiment the parallel operation and analyze the load sharing of single phase transformers	L4

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
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	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
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CO2	3	3	–	3	–	–	–	3	–	–	–	–	3	3	3
CO3	3	3	3	3	2	1	–	3	–	–	–	–	3	3	3
CO4	3	2	3	3	2	–	–	3	1	–	–	–	1	3	1
CO5	3	3	3	–	2	2	1	3	2	–	–	–	3	3	3
AVG	3	2.8	1.8	2.2	1.2	0.6	0.4	3	0.6	–	–	0.4	2.4	2.8	2.6



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### COURSE OBJECTIVES

EE P32- ELECTRONICS LAB - I [Total no. of Students: 10] [2<sup>nd</sup> Year, 3<sup>rd</sup> Semester]

**Course Prerequisite:** Knowledge characteristic of various switching devices and operation of BJT & FET

### Course Objective:

1. To understand IV characteristic of various switching devices.
2. To understand for operation of BJT & FET.
3. To understand the biasing techniques for transistor.
4. To know the switching characteristics of transistor.
5. To design of various transistor biasing circuits.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understand the volt-ampere characteristics of basic electron devices such as PN junction diode, zener diode, bipolar junction transistor, field effect transistor, and silicon controlled rectifier	L2
CO2	Knowledge about the design of biasing circuits of BJT and FET in order to apply them for realizing any electronic circuits	L2
CO3	Know the switching characteristics of transistor bipolar junction transistor, field effect transistor, and silicon controlled rectifier	L3
CO4	Understand the operation of half wave and full wave rectifiers with and without filters & diode clippers and clampers	L3
CO5	Knowledge about the design of biasing circuits of BJT and FET in order to apply them for realizing any electronic circuits	L3

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes			
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems		
PO2	Problem analysis				
PO3	Design/development of solutions				
PO4	Conduct investigations of complex problems				
PO5	Modern tool usage				
PO6	The engineer and society				
PO7	Environment and sustainability				
PO8	Ethics				
PO9	Individual and team work			PSO2	Problem Solving Skills
PO10	Communication				
PO11	Project management and finance				
PO12	Life-long learning			PSO3	Computing and Research Ability







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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	–	2	–	–	1	–	–	–	–	2	2	2	3
CO2	3	3	–	3	–	–	–	–	–	–	–	–	3	3	3
CO3	3	3	3	3	2	1	–	–	–	–	–	–	3	3	3
CO4	3	2	3	3	2	–	–	–	1	–	–	–	1	3	1
CO5	3	3	3	–	2	2	1	–	2	–	–	–	3	3	3
AVG	3	2.8	1.8	2.2	1.2	0.6	0.4	–	0.6	–	–	0.4	2.4	2.8	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T33- FLUID AND THERMAL MACHINES LAB [Total no. of Students: 10] [2<sup>nd</sup> Year, 3<sup>rd</sup> Semester]

**Course Prerequisite:** Knowledge on principles of fluid mechanics, measurement of parameters of fluids

### Course Objective:

1. To understand about hydraulic machines like the hydraulic turbines which drive electric generators and the hydraulic pumps which are driven by electric motors
2. To know about hydraulic machines like the hydraulic turbines which drive electric generators and the hydraulic pumps which are driven by electric motors
3. To calculate the cycle efficiencies for the above mentioned power plants
4. To Calculate the fluid properties, fluid flow rates, comprehend the differences between various types of hydraulic machines,
5. To understand the operation of various power plants and calculate their efficiency.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understanding of fundamental principles in fluid mechanics, including fluid properties, fluid statics, fluid dynamics, and the application of conservation laws.	L2
CO2	Ability to analyze and design thermal systems including heat exchangers, boilers, turbines, and compressors, considering efficiency, performance, and environmental impact.	L4
CO3	Ability to analyze and design thermal systems including heat exchangers, turbines, and compressors, considering efficiency, performance, and environmental impact.	L4
CO4	Proficiency in applying thermodynamic principles to analyze energy conversion processes, such as power cycles, refrigeration cycles, and their components.	L4
CO5	Capability to evaluate the performance characteristics of fluid machines like pumps, gas turbines and air compressors, and their applications in engineering systems.	L5

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes			
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems		
PO2	Problem analysis				
PO3	Design/development of solutions				
PO4	Conduct investigations of complex problems				
PO5	Modern tool usage				
PO6	The engineer and society				
PO7	Environment and sustainability				
PO8	Ethics				
PO9	Individual and team work			PSO2	Problem Solving Skills
PO10	Communication				
PO11	Project management and finance				
PO12	Life-long learning			PSO3	Computing and Research Ability







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	-	1	-	-	-	-	-	-	-	2	2	2	2
CO2	3	3	-	3	-	-	-	-	-	-	-	-	2	2	1
CO3	3	3	3	1	-	-	-	-	-	-	-	-	2	2	2
CO4	3	2	3	1	-	-	-	-	1	-	-	-	3	3	1
CO5	3	3	3	-	-	-	-	-	2	-	-	-	3	3	2
AVG	3	2.8	1.8	1.2	-	-	-	-	0.6	-	-	0.4	2.4	2.4	1.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T51 COMMUNICATION ENGINEERING [Total no. of. Students: 14] [3<sup>rd</sup> Year, 5<sup>th</sup> Semester]

**Course Prerequisite:** Basic knowledge on Various Communication System

#### Course Objectives

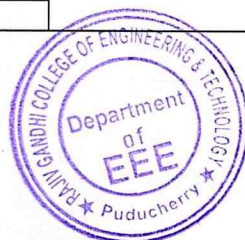
1. To understand the concept of analog and digital modulation techniques .
2. To study various analog modems.
3. To understand the need for error control techniques.
4. To learn the power lines for communication.
5. To understand the role of communication engineering in the realization of smart grids

#### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Define the fundamentals and functions of various communication systems.	L1
CO2	Understand the working operation of analog & digital modulation techniques used in communication systems.	L2
CO3	Apply various methods used in communication systems for generation & reception of modulated & demodulated signals.	L2
CO4	Analyze the waveforms of various modulation & demodulation techniques.	L4
CO5	Analyze data on a conductor that is also used simultaneously for AC electric power transmission.	L4

#### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability





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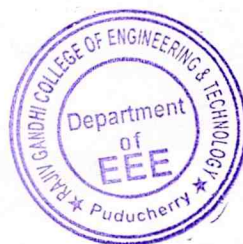
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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	1	3	3	-	-	-	-	-	-	-	-	1	2
CO2	3	2	1	3	2	-	-	-	-	-	-	-	-	1	2
CO3	3	3	1	2	2	-	-	-	-	-	-	-	-	1	2
CO4	3	2	2	3	2	-	-	-	-	-	-	-	-	1	2
CO5	3	3	3	3	3	-	-	-	-	-	-	-	-	1	2
AVG	3	2.4	1.6	2.8	2.4	-	-	-	-	-	-	-	-	1	2



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T52 Analog and Digital Integrated Circuits [Total no. of. Students: 14] [3<sup>rd</sup> Year, 5<sup>th</sup> Semester]

**Course Prerequisite:** Basic knowledge on IC Fabrication and its Application

1. To learn about IC fabrication and logic families.
2. To understand the various types of amplifier circuits.
3. To learn about applications of analog ICs..
4. To design the various types of active filters and waveform generator
5. To design and develop the circuits by using op- amps

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understand the fabrication of ICs and the digital logic families	L2
CO2	Understand the characteristics of op-amps and it's types	L2
CO3	Deign of square wave, triangular wave generator using op- amp	L6
CO4	Design of Analog to Digital & Digital to Analog converter using op-amp	L6
CO5	Design and implementation of Astable, Monostable, Scmitt trigger circuits using 555 timer IC	L6

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	3	2	-	-	-	-	-	-	-	-	1	1	2
CO2	3	3	3	2	-	-	-	-	-	-	-	-	1	2	2
CO3	3	3	3	2	-	-	-	-	-	-	-	-	1	2	2
CO4	3	3	3	2	-	-	-	-	-	-	-	-	1	1	2
C05	3	3	3	2	-	-	-	-	-	-	-	-	1	1	2
AVG	3	3	3	2	-	-	-	-	-	-	-	-	1	1.4	2



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EET-53 TRANSMISSION AND DISTRIBUTION [Total no. of. Students: 14] [3<sup>rd</sup> Year, 5<sup>th</sup> Semester]

**Course Prerequisite:** Basic knowledge on the Structure of power systems, Transmission line Parameters, and study of distribution system

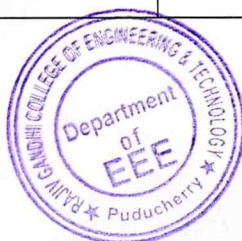
1. To learn the structure of the electrical power system with various types of A.C/D.C distribution systems
2. To learn the classification of transmission lines and their technical parameters.
3. To understand the concept of transmission line models and its performance.
4. To understand the necessity and importance of various insulators and cables used in power systems.
5. To have an overview of the modern electrification schemes and recent technologies in Transmission and Distribution system.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understand the structure of power system in a various types of distribution system & design a radial, ring main distribution feeders to calculate the voltage drops & power loss	L2
CO2	Determine the transmission line parameter in a transmission system & gain the knowledge about skin & proximity effect , bundled conductor	L4
CO3	Identify the types of transmission line, best method for voltage control & evaluate the performance of a transmission lines	L4
CO4	Gain the knowledge of cables & insulators & study of distribution system	L5
CO5	Discuss the need of HVDC lines & recent trends in transmission	L5

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage	PSO2	Problem Solving Skills
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics	PSO3	Computing and Research Ability
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	–	–	–	–	1	–	–	–	–	2	2	3	2
CO2	3	3	–	3	–	–	–	–	–	–	–	–	2	2	1
CO3	3	3	3	3	2	–	–	–	–	–	–	–	2	2	2
CO4	3	2	3	3	–	–	–	–	1	–	–	–	3	3	1
CO5	3	3	3	–	2	1	1	–	2	–	–	–	3	3	2
AVG	3	2.8	1.8	1.8	0.8	0.2	0.4	–	0.6	–	–	0.4	2.4	2.6	1.6



  
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T54 POWER ELECTRONICS [Total no. of. Students: 14] [3<sup>rd</sup> Year, 5<sup>th</sup> Semester]

**Course Prerequisite:** Basic knowledge on Power Electronics and its Application.

1. To explain about the operations, switching characteristics of power semiconductor devices
2. To study the operations and performance parameters of controlled Rectifiers.
3. To analyze the operation and performance of dc to dc converters.
4. To impart knowledge on different control techniques for inverters.
5. To familiarize the principle of operation of AC voltage controllers and cyclo converters.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Explain the significance of switching devices and its application to power converters and demonstrate the triggering circuit and snubber circuit.	L3
CO2	Compare the operation of two, three pulse converters and draw output waveforms with and without source and load inductance.	L4
CO3	Classify the operation of choppers and outline the applications of SMPS.	L2
CO4	Analyze the operation of single phase and three phase inverters with and without PWM technique.	L4
CO5	Illustrate the operation of AC voltage controllers and cycloconverters and its applications.	L2

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes		
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems	
PO2	Problem analysis			
PO3	Design/development of solutions			
PO4	Conduct investigations of complex problems			
PO5	Modern tool usage	PSO2		Problem Solving Skills
PO6	The engineer and society			
PO7	Environment and sustainability			
PO8	Ethics			
PO9	Individual and team work	PSO3		Computing and Research Ability
PO10	Communication			
PO11	Project management and finance			
PO12	Life-long learning			





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	-	1	-	-	-	-	-	3	1	3
CO2	3	3	3	2	1	-	-	-	-	-	-	-	3	2	3
CO3	3	3	3	2	1	-	-	-	-	-	-	-	3	2	3
CO4	3	3	3	2	1	-	-	-	-	-	-	-	3	2	3
CO5	3	3	3	2	1	-	-	-	-	-	-	-	3	2	3
AVG	3	2.8	2.6	1.8	1	-	0.2	-	-	-	-	-	3	1.8	3



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T55 MEASUREMENTS AND INSTRUMENTATION) [Total no. of. Students: 14] [3<sup>rd</sup> Year, 5<sup>th</sup> Semester]

**Course Prerequisite:** Basic knowledge about calibration, and different types of electrical instruments

1. To understand the basics of measurement and instrumentation
2. To acquire knowledge about calibration, and different types of electrical instruments.
3. To introduce the working principle of various bridges and magnetic measurements.
4. To analyze the concepts of display devices and to be aware of transducers.

### Course Outcomes:

COS	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Know the basic measurement systems.	L1
CO2	Understand the basics of measurement and instrumentation and to acquire knowledge about calibration and types of instrument.	L2
CO3	Demonstrate the working principle of various bridges and magnetic measurements.	L3
CO4	Analyze the concepts of display devices and to be aware of transducers.	L4
CO5	Identify and choose appropriate instruments for different applications.	L5

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes			
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems		
PO2	Problem analysis				
PO3	Design/development of solutions				
PO4	Conduct investigations of complex problems				
PO5	Modern tool usage				
PO6	The engineer and society				
PO7	Environment and sustainability				
PO8	Ethics				
PO9	Individual and team work			PSO2	Problem Solving Skills
PO10	Communication				
PO11	Project management and finance				
PO12	Life-long learning			PSO3	Computing and Research Ability







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	1	1	–	–	–	1	1	1	–	2	3	3	1	1
CO2	3	2	2	1	1	–	–	2	1	–	2	3	3	2	1
CO3	3	3	2	1	2	–	–	2	1	–	2	3	3	2	1
CO4	3	2	1	2	2	–	1	3	1	–	2	3	3	2	1
CO5	3	2	1	1	1	–	–	2	1	–	2	3	3	2	1
AVG	3	2	1.4	1.3	1.5	–	0.4	2	1	–	2	3	3	1.8	1



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE E05 ENERGY ENGINEERING [Total no. of. Students: 14] [3<sup>rd</sup> Year, 5<sup>th</sup> Semester]

**Course Prerequisite:** Basic knowledge about conventional energy systems to upcoming renewable energy systems

1. To knowledge on various energy sources.
2. To gain adequate knowledge on Conventional Energy Sources
3. To understand about the Hydro and Ocean Energy Electric Technologies
4. To provide knowledge on Wind, Solar Energy and DG Technologies.
5. To provide knowledge on Energy Conservation and Management

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Analyze the national and international energy scenario of renewable energy Sources.	L4
CO2	Design the aerodynamics of wind turbines and calculate their energy production.	L5
CO3	Analyze electrical power generation from biomass, geothermal, tidal, wave etc.	L4
CO4	Analyze technical and sustainability issues involved in the integration of renewable energy systems	L4
CO5	Compare the cost economics of using renewable energy sources with non-renewable energy sources.	L4

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society	PSO2	Problem Solving Skills
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work	PSO3	Computing and Research Ability
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		





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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	1	1	1	-	1	-	-	-	-	-	3	1	2
CO2	3	3	3	2	1	-	-	-	-	-	-	-	3	2	2
CO3	3	3	3	2	1	-	-	-	-	-	-	-	3	2	2
CO4	3	3	3	2	1	-	-	-	-	-	-	-	3	2	2
CO5	3	3	3	2	1	-	-	-	-	-	-	-	3	2	2
AVG	3	2.8	2.6	1.8	1	-	0.2	-	-	-	-	-	3	1.8	2



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE P51 ELECTRONICS III LAB [Total no. of. Students: 14] [3<sup>rd</sup> Year, 5<sup>th</sup> Semester]

**Course Prerequisite:** Basic knowledge about OPAMP 741 and 555 Timer.

### Course Objectives:

1. To learn design, testing and characterizing of circuit behavior with analog ICs.
2. To familiarize the AC and DC characteristics of OPAMP 741.
3. To outline the design procedure of the different applications of OPAMP 741.
4. To introduce the design of filters and waveform generators using OPAMP 741.
5. To impart knowledge on the design and realization of multivibrator circuits using 555 Timer

### Course Outcomes:

Course Outcomes		
COs	On successful completion of the module students will be able to:	LEVEL
CO1	Design and use the OPAMP for various applications.	L5
CO2	Design the application circuits like A/D, D/A filters using OPAMP and special ICs.	L5
CO3	Design and test various waveform generation circuits using OPAMPS and special ICs	L5
CO4	Design and test regulator circuits for power supplies using voltage regulator ICs.	L5
CO5	Verify and demonstrate V/F, frequency multiplier and SMPS	L5

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes			
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems		
PO2	Problem analysis				
PO3	Design/development of solutions				
PO4	Conduct investigations of complex problems				
PO5	Modern tool usage				
PO6	The engineer and society				
PO7	Environment and sustainability				
PO8	Ethics				
PO9	Individual and team work			PSO2	Problem Solving Skills
PO10	Communication				
PO11	Project management and finance				
PO12	Life-long learning			PSO3	Computing and Research Ability





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	3	–	1	3	–	–	–	–	3	–	2
CO2	3	3	3	2	1	–	–	2	–	–	–	–	3	–	2
CO3	3	3	3	2	1	–	–	2	–	–	–	–	3	–	2
CO4	3	3	3	2	1	–	–	2	–	–	–	–	3	–	2
CO5	3	3	3	2	1	–	–	2	–	–	–	–	3	–	2
AVG	3	2.8	2.6	1.8	1.4	–	0.2	2.2	–	–	–	–	3	–	2



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE P52 MEASUREMENTS AND CONTROL LAB [Total no. of. Students: 14] [3<sup>rd</sup> Year, 5<sup>th</sup> Semester]

**Course Prerequisite:** Basic knowledge about constructional details of various measuring instruments for a better understanding of their working principles

#### Course Objectives:

1. To understand of their working principles the constructional details of various measuring instruments.
2. To demonstrate various Bridges for the measurement of resistance, inductance and capacitance using simulation and hardware set ups.
3. To understand the concept of magnetism and to determine the B-H curve for magnetic material specimen.
4. To calibrate the single phase and 3 phase energy meter.
5. To analyze modelling parameters of electrical machines

#### Course Outcomes:

Course Outcomes		
COs	On successful completion of the module students will be able to:	LEVEL
CO1	Realize the advantages and the necessity of measurement systems in all Engineering and Scientific works	L2
CO2	Measure Resistance, Inductance and capacitance using AC and DC bridges.	L4
CO3	Determine the magnetization characteristics and hysteresis loss of Iron specimen using BH curve.	L3
CO4	Calibrate single phase and three phase energy meters used in domestic and commercial applications.	L4
CO5	Simulate modelling parameters of electrical machines	L6

#### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems	PSO2	Problem Solving Skills
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability	PSO3	Computing and Research Ability
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	–	1	2	1	–	1	–	–	–	–	–	3	1	1
CO2	3	2	1	2	1	–	–	1	1	–	–	–	3	2	1
CO3	3	2	1	2	1	–	–	1	1	–	–	–	3	2	1
CO4	3	2	–	2	1	–	–	1	1	–	–	–	3	2	1
CO5	3	2	–	2	1	–	–	–	–	–	–	–	3	3	1
AVG	3	1.6	0.6	2	1	–	0.2	0.6	0.6	–	–	–	3	2	1



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

HSP53- GENERAL PROFICIENCY-I [Total no. of Students: 14] [3<sup>rd</sup> Year, 5<sup>th</sup> Semester]

**Course Prerequisite:** knowledge on art of communication Soft skills

### Course Objective:

1. To make important especially in the wake of looming manpower crisis the
2. To focuses on importance of communication, soft skills,
3. To make the students linguistically proficient by honing their language skills
4. To craft importance of speaking etiquette, and verbal and numerical aptitude
5. To develop the Strategic Communication in Business and the Professions

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Enhance both written and verbal communication skills necessary for effective interaction in academic, professional, and social contexts.	L2
CO2	Develop the ability to analyze information critically, evaluate arguments, and make informed decisions.	L4
CO3	Develop the ability to locate, evaluate, and effectively use information from various sources, including digital and traditional resources for improving writing skills	L4
CO4	Enhance skills in working collaboratively with diverse groups, contributing effectively to team goals and outcomes.	L2
CO5	Improve skills in interpreting and manipulating numerical and statistical data.	L2

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	-	-	-	-	-	1	-	-	2	-	2	-	-	-
CO2	3	-	-	-	-	-	-	-	-	2	-	-	-	-	-
CO3	3	-	-	-	2	-	-	1	-	3	-	-	-	-	-
CO4	3	-	-	-	2	-	-	1	1	3	-	-	-	-	-
CO5	3	3	3	-	-	-	1	1	2	2	-	-	3	-	-
AVG	3	0.6	0.6	-	0.8	-	0.4	0.6	0.6	2.4	-	0.4	0.6	-	-



  
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T71 INDUSTRIAL MANAGEMENT [Total no. of. Students: 16] [4<sup>th</sup> Year, 7<sup>th</sup> Semester]

**Course Prerequisite:** Basic knowledge about management principles, accidents and also the aspects of manpower planning and job analysis.

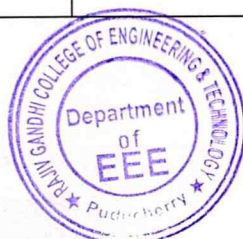
1. To understand the core concept of management principles in an industrial environment.
2. To discuss the key aspects of sales and marketing management like advertising, sales promotion and sales forecasting
3. To understand the concept of industrial psychology and personal management.
4. To know about the causes and remedies for fatigue, accidents and also the aspects of manpower planning and job analysis.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understand the flow of goods and services in an economy and its implications on engineering decisions.	L2
CO2	Analyze the effective interest rate and its significance in financing engineering projects	L4
CO3	Apply the present worth method to compare engineering alternatives using revenue-dominated and cost-dominated cash flow diagrams.	L4
CO4	Analyze Henri Fayol's principles of management and their applicability in engineering project management.	L4
CO5	Classify types of capital and their role in financing short-term and long-term engineering initiatives	L5

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage	PSO2	Problem Solving Skills
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work	PSO3	Computing and Research Ability
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		





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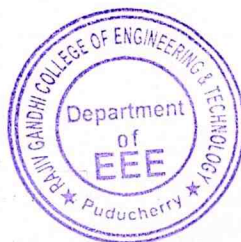
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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	–	1	1	1	–	1	–	–	–	–	–	3	1	1
CO2	3	2	3	2	1	–	–	1	–	–	–	–	3	2	1
CO3	3	2	3	2	1	–	–	1	–	–	–	–	3	2	1
CO4	3	2	3	2	1	–	–	1	–	–	–	–	3	2	1
CO5	3	–	3	2	1	–	–	–	–	–	–	–	3	2	1
AVG	3	1.2	2.6	1.8	1	–	0.2	0.6	–	–	–	–	3	1.8	1



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T72 SOLID STATE DRIVES [Total no. of. Students: 16] [4<sup>th</sup> Year, 7th Semester]

**Course Prerequisite:** Basic knowledge about management principles, accidents and also the aspects of manpower planning and job analysis.

1. To understand the performance of electric drives controlled from power electronic converters.
2. To learn about the characteristics, modeling and selection of motor power rating.
3. To understand the operation and performance of converter and chopper fed dc drives.
4. To learn the solid-state control of induction motors both from stator side and rotor side and closed loop operation of electric drives and various control techniques.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understand the working of solid state switches.	L2
CO2	Analyze the performance of electric drives controlled by power electronic converter.	L4
CO3	Predict the characteristics, modelling and selection of motor power rating.	L4
CO4	Demonstrate the operation and performance of converter and chopper fed DC drives.	L3
CO5	Design a solid state control of induction motors from stator & rotor side and to analyze the closed loop operation of electric drives and various control techniques.	L6

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO3	Computing and Research Ability







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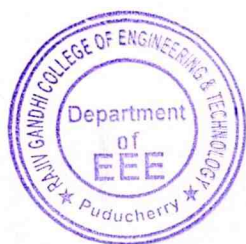
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Professional Electrical and Electronic	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	2	2	1	-	-	-	-	-	-	1	3	1	-
CO2	3	3	2	2	2	-	1	-	-	-	-	-	3	2	-
CO3	3	3	1	2	2	-	-	-	-	-	-	-	3	1	-
CO4	3	3	2	2	2	-	1	-	-	-	-	-	3	2	-
CO5	3	3	1	1	1	-	-	-	-	-	-	-	3	2	-
AVG	3	3	1.6	1.8	1.6	-	0.33	-	-	-	-	-	3	1.6	-



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVE:

EE T73 POWER SYSTEM OPERATION AND CONTROL [Total no. of. Students: 16] [4<sup>th</sup> Year, 7th Semester]

**Course Prerequisite:** Knowledge of Power System Operation, control technology and recent advancements

### Course objective:

1. To know the importance of frequency control and recent advancements in power system operation (SCADA)
2. To understand the Load Forecasting and unit commitment problem
3. To understand real time control of power system
4. To analyze the economic load dispatch schedule
5. To analyze different methods to control reactive power.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understand the security concepts of real power control and the concept of computer control of power systems and data acquisition.	L2
CO2	Predict the load forecasting and unit commitment problem.	L6
CO3	Apply real time problems for implantation.	L3
CO4	Comprehend the significance of the economic dispatch issues.	L6
CO5	Examine the various techniques for controlling reactive power.	L2

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	0	2	–	3	3	3	–	3	2	3	3	3	2	2
CO2	3	3	3	2	–	3	3	–	3	–	–	3	2	3	2
CO3	3	3	3	3	–	3	3	–	3	–	–	3	3	–	2
CO4	3	3	3	3	–	3	2	–	3	–	–	3	3	–	2
CO5	3	–	3	–	–	3	1	–	3	–	–	3	–	2	2
AVG	3	1.8	2.8	1.6	0.6	3	2.4	–	3	0.4	0.6	3	2.2	1.4	2



  
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVE

EE E16 POWER SYSTEM RESTRUCTURING AND DEREGULATION [Total no. of. Students: 16] [4th Year, 7th Semester]

**Course Prerequisite:** Knowledge Power system Restructuring and Deregulation

### Course objective:

1. To understand the electricity power business and technical issues in a restructured power system in both Indian and world scenario.
2. To provide the students a systems perspective of modern electricity markets and a systems approach to address various issues faced by the electricity sector.
3. To equip the students to understand the need for restructured power system along with electricity market models
4. To impart the students with a knowledge on Indian power sector

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understand the architecture of power market	L2
CO2	Explain different methods of computing techniques for Available Transfer Capability	L2
CO3	Analyze the different methods of congestion management	L4
CO4	Apply different transmission pricing methods	L4
CO5	Understand the salient features of Indian electricity act 2003	L2

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability







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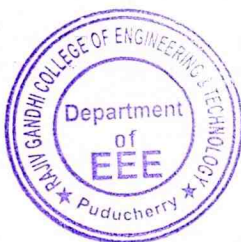
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	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	3	1	-	-	-	-	-	-	-	-	1	2	3
CO2	3	3	3	1	-	-	-	-	-	-	-	-	1	2	3
CO3	3	3	3	1	-	-	-	-	-	-	-	-	1	2	3
CO4	3	3	3	1	-	-	-	-	-	-	-	-	1	2	3
CO5	3	3	3	1	-	-	-	-	-	-	-	-	1	2	3
AVG	3	3	3	1	-	-	-	-	-	-	-	-	1	2	3



  
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# RAJIV GANDHI COLLEGE OF ENGINEERING AND TECHNOLOGY

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVE:

EE E19 SMART GRID [Total no. of. Students: 16] [4th Year, 7th Semester]

**Course Prerequisite:** Knowledge about the fundamentals of smart grids technologies, Wide Area Measurement Systems, Energy storage technologies for smart grid.

### Course objective:

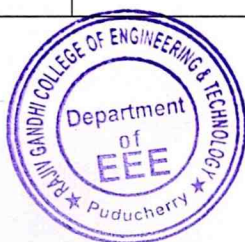
1. To understand the concept of Conventional, Smart Grid and need of Smart Grid.
2. To Learn the concept of PMU, PDC & WAMS in Smart grid.
3. To learn about the smart metering, AMR, AMI and Outage management systems.
4. To understand the different types of communications used in smart grid.
5. To know about renewable integration and classify the different types of storage elements used in smart grid.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understand the concept of Conventional, Smart Grid and need of Smart Grid.	L2
CO2	Understand the concept of PMU, PDC & WAMS in Smart grid.	L2
CO3	Understand the Smart metering, AMR, AMI, DSI and Power quality management.	L2
CO4	Understand the different types of communication technologies used in smart grid	L2
CO5	Know about the different Energy storage alternatives in smart grid	L2

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage	PSO2	Problem Solving Skills
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics	PSO3	Computing and Research Ability
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	–	3	–	3	3	2	–	2	–	2	3	2	–	3
CO2	3	3	–	3	3	3	3	–	2	3	2	3	3	3	3
CO3	3	–	3	–	3	3	2	2	–	–	–	3	3	–	3
CO4	3	–	–	–	3	3	3	–	2	3	–	3	3	2	3
CO5	3	3	3	–	3	3	2	2	3	–	2	3	3	3	3
AVG	3	1.2	1.8	0.6	3	3	2.4	0.8	1.8	1.2	1.2	3	2.8	1.6	3



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES :

EET71 POWER SYSTEM SIMULATION LAB [Total no. of. Students: 16] [4th Year, 7th Semester]

**Course Prerequisite:** Basic Knowledge about per unit analysis short circuit studies and Economic load dispatch on power system

### Course Objectives:

1. To analyze the electrical power system using per unit analysis.
2. To apply iterative techniques for power flow analysis of power system.
3. To carry out short circuit studies and Economic load dispatch on power system.
4. To analyze Load curve and Load duration curve.
5. To model and analyze the voltage and frequency control loops in power system.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Calculate the reactance values of power system components.	L3
CO2	Formulate Bus Admittance and Impedance matrices, used in power flow analysis.	L5
CO3	Analyze the voltage and power flow condition of power system using Gauss Seidal and Newton Raphson methods.	L4
CO4	Analyze Symmetrical and Unsymmetrical faults in power system used to design relays and circuit breakers.	L4
CO5	Develop the load and load duration curves for calculating average load, unit generated load factor, etc.	L5

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	–	3	–	2	3	2	–	2	–	2	3	2	–	2
CO2	3	3	–	3	3	3	3	–	2	3	2	3	3	3	2
CO3	3	–	3	–	2	3	2	2	–	–	–	3	3	–	2
CO4	3	–	–	–	3	3	3	–	2	3	–	3	3	2	3
CO5	3	3	3	–	1	3	2	–	3	–	2	3	3	3	3
AVG	3	1.2	1.8	0.6	2.2	3	2.4	0.4	1.8	1.2	1.2	3	2.8	1.6	2.4



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES:

EE-P72 SEMINAR [Total no. of. Students: 16] [4<sup>th</sup> Year, 7<sup>th</sup> Semester]

#### Course Objective:

1. To provide confidence to communicate their thoughts.
2. To make the ability to presentation of subjects.
3. To enhance the demonstration of their Projects.

#### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	To improve the communication.	L2
CO2	To develop the personality.	L2
CO3	To create the Knowledge shrining.	L2
CO4	To enhance the confidence	L2

#### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes			
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems		
PO2	Problem analysis				
PO3	Design/development of solutions				
PO4	Conduct investigations of complex problems				
PO5	Modern tool usage				
PO6	The engineer and society				
PO7	Environment and sustainability				
PO8	Ethics				
PO9	Individual and team work			PSO2	Problem Solving Skills
PO10	Communication				
PO11	Project management and finance				
PO12	Life-long learning			PSO3	Computing and Research Ability







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
PO/COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	–	2	–	3	1	–	1	1	3	–	3	–	–	–
CO2	3	–	2	–	3	1	–	1	1	3	–	3	–	–	–
CO3	3	–	2	–	3	1	–	1	1	3	–	3	–	–	–
CO4	3	–	2	–	3	1	–	1	1	3	–	3	–	–	–
AVG	3	–	2	–	3	1	–	1	1	3	–	3	–	–	–



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE PW7- PROJECT WORK PHASE-I [Total no. of. Students: 16] [4<sup>th</sup> Year, 7<sup>th</sup> Semester]

**Course Prerequisite:** Fundamentals of Software Engineering, Problem-solving skills and Application Development Knowledge.

### Course Objective:

1. To develop the skills to solve a specific problem right from its identification and literature review till the successful solution of the same.
2. To develop students innovative ideas for the prototype design.
3. To encourage the students to work as a team to solve the engineering problem
4. To train the students for the preparation of project reports.
5. To train the students to defend reviews and viva voce examination.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Identify the problem statement for the proposed work through the literature survey.	L3
CO2	Choose the proper components as per the requirements of the design/system.	L2
CO3	Apply the acquainted skills to develop final model/system.	L2
CO4	Estimate, plan and execute the project as a team.	L3
CO5	Defend the finding and conclude with oral/written reports.	L2

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes			
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems		
PO2	Problem analysis				
PO3	Design/development of solutions				
PO4	Conduct investigations of complex problems				
PO5	Modern tool usage				
PO6	The engineer and society				
PO7	Environment and sustainability				
PO8	Ethics				
PO9	Individual and team work			PSO2	Problem Solving Skills
PO10	Communication				
PO11	Project management and finance				
PO12	Life-long learning			PSO3	Computing and Research Ability







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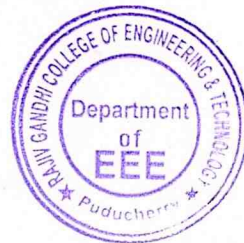
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	2	2	–	–	–	–	3	3	–	1	1	2	1
CO2	3	3	3	2	2	2	2	2	3	3	3	1	2	1	1
CO3	3	2	2	1	–	2	–	–	3	3	3	1	3	3	3
CO4	3	3	3	1	–	–	2	2	3	3	1	1	1	2	3
CO5	3	3	3	1	–	–	2	2	3	3	1	1	2	2	3
AVG	3	2.6	2.6	1.4	0.4	0.8	1.2	1.2	3	3	1.6	1	1.8	2	2.2



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE P73- INDUSTRIAL VISITS/TRAINING REPORT [Total no. of Students: 11] [4<sup>th</sup> Year, 7<sup>th</sup> Semester]

**Course Prerequisite:** knowledge on art of communication Soft skills

### Course Objective:

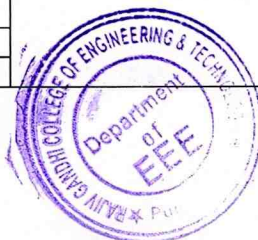
1. To gain firsthand experience and insights into industrial processes, technologies, and practices relevant to electrical engineering.
2. To apply theoretical concepts learned in classrooms to real-world industrial environments, understanding how theoretical principles translate into practical applications.
3. To develop professionalism, communication skills, teamwork, and leadership qualities through interaction with industry professionals and peers.
4. To develop skills in documenting observations, findings, and insights gathered during industrial visits or training sessions.
5. To enhance technical writing skills by preparing a comprehensive report summarizing the industrial visit or training experience, including analysis, conclusions, and recommendations.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Apply theoretical knowledge acquired in coursework to understand and analyze real-world industrial practices and challenges.	L2
CO2	Understand industry standards, regulations, safety protocols, and best practices in electrical engineering and related fields.	L2
CO3	Develop problem-solving and critical thinking skills to address challenges encountered during industrial visits or training activities.	L5
CO4	Reflect on the industrial visit or training experience, evaluating personal learning outcomes, strengths, areas for improvement, and future goals.	L4
CO5	Enhance skills in documenting observations, findings, and insights gathered during industrial visits or training sessions. Prepare a comprehensive and structured report summarizing the experience.	L3

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage	PSO2	
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work	PSO3	Computing and Research Ability
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		







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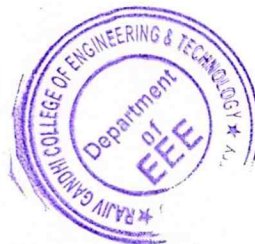
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	1	1	–	2	1	1	1	–	3	–	2	1	1	1
CO2	3	1	1	–	2	1	–	1	–	3	–	–	1	1	1
CO3	3	1	1	–	2	1	–	1	–	3	–	–	1	1	1
CO4	3	1	1	–	2	1	–	1	1	3	–	–	1	1	1
CO5	3	1	1	–	2	1	–	1	2	3	–	–	1	1	1
AVG	3	1	1	–	2	1	0.2	1	0.6	3	–	0.4	1	1	1



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# *Department of EEE*

*CO PO Mapping  
2022-23 (Even Semester)*







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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR 2022- 23 (Even Semester)

### COURSE OBJECTIVES

MA-T41 MATHEMATICS-IV [Total no. of. Students: 10] [2<sup>nd</sup> Year, 4<sup>th</sup> Semester]

**Course Prerequisite:** Basic knowledge for formulas partial differential equation and statistical methods.

### Course Objective:

1. To understand the Importance of Partial differential equations
2. To apply the analytic functions and problem-solving techniques of PDE
3. To make the students knowledgeable in the areas of Boundary Value Problems like vibrating string (wave equation), Heat equation in one and two dimensions.
4. To acquaint the students with the concepts of Theory of sampling.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understand the different types of PDE and will be able to solve problems occurring in the area of engineering and technology.	L2
CO2	Know sampling theory and apply to solve practical problems in engineering and technology.	L2
CO3	Gain the knowledgeable in the areas of boundary value problems like vibrating string (wave equation), heat equation in one and two dimensions.	L2
CO4	Understand and implement the concepts of theory sampling.	L2
CO5	Understand the use statistics for inferential decision making with confidence intervals and hypothesis tests under different statistical methods.	L2

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes			
PO1	Engineering Knowledge	PSO1 Skilled Professional Electrical and Electronic Systems			
PO2	Problem analysis				
PO3	Design/development of solutions				
PO4	Conduct investigations of complex problems				
PO5	Modern tool usage				
PO6	The engineer and society				
PO7	Environment and sustainability				
PO8	Ethics				
PO9	Individual and team work			PSO2 Problem Solving Skills	
PO10	Communication				
PO11	Project management and finance				
PO12	Life-long learning			PSO3 Computing and Research Ability	





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
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CO1	3	3	–	2	1	1	–	2	–	–	–	–	2	2	3
CO2	3	3	–	2	3	–	–	2	–	–	–	–	3	3	3
CO3	2	3	1	3	3	1	–	1	3	–	–	–	3	3	3
CO4	3	3	1	3	1	–	–	2	–	–	–	–	1	3	1
CO5	3	3	–	3	3	1	1	2	3	–	–	–	3	3	3
AVG	2.8	3	0.4	2.6	2.2	0.6	0.2	1.8	1.2	–	–	–	2.4	2.8	2.6



  
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T42 -ELECTRICAL MACHINES – II [Total no. of Students: 10] [2<sup>nd</sup> Year, 4<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge of AC Electrical Machines & its application

### Course Objective:

1. To equip the students to understand and analyze the characteristics of 3 phase Induction motor.
2. To understand the Induction Motor Basics of starting and speed control.
3. To understand the basic principles and construction of synchronous generators.
4. To understand the basic principles and construction of synchronous motor.
5. To understand the characteristics of different ac machines and their application.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Evaluate and analyze the performance of Induction motor using equivalent circuits and circle diagram.	L3
CO2	Apply suitable starting and speed control methods to enhance the performance of three phase induction motors.	L3
CO3	Analyze the performance characteristics of Synchronous generator and compute voltage regulation with different methods.	L4
CO4	Analyze the characteristics of synchronous motor and its performance with effect of varying load and excitation.	L4
CO5	Recognize the characteristics of special machines as well as choose an appropriate motor for any industrial application	L3

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability







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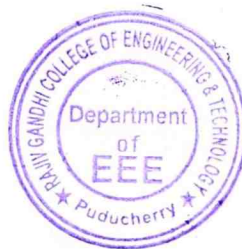
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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
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CO2	3	3	3	2	-	-	-	3	3	-	-	-	3	3	3
CO3	3	3	3	-	-	2	-	3	3	-	-	-	3	3	3
CO4	3	3	3	2	-	2	-	-	3	-	-	-	3	3	1
CO5	3	3	3	2	-	2	-	-	3	-	-	-	3	3	3
AVG	3	3	3	1.6	-	1.6	-	1.8	3	-	-	-	3	3	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T43- ELECTRONIC CIRCUITS [Total No. of. Students: 10] [2ndYear, 4th Semester]

**Course Prerequisite:** Knowledge of different types of Amplifiers

### Course Objectives:

1. To impart knowledge on frequency response of small signal and large signal amplifiers.
2. To explore the working of amplifiers with positive and negative feedback systems.
3. To familiarize in time base and sweep circuits.
4. To impart the importance of multi stage amplifier.
5. To introduce stable operating point for BJT on various classes of power amplifiers.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Design the transistor Amplifier using its small signal model	L6
CO2	Design cascade amplifier and sweep circuits	L6
CO3	Evaluate the performance analysis of large signal amplifier	L4
CO4	Design the feedback amplifiers and analyze frequency response	L6
CO5	Design oscillators for different types of signal generation	L6

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes			
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems		
PO2	Problem analysis				
PO3	Design/development of solutions				
PO4	Conduct investigations of complex problems				
PO5	Modern tool usage				
PO6	The engineer and society				
PO7	Environment and sustainability				
PO8	Ethics				
PO9	Individual and team work			PSO2	Problem Solving Skills
PO10	Communication				
PO11	Project management and finance				
PO12	Life-long learning			PSO3	Computing and Research Ability





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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PSO 2	PSO 3
CO1	3	1	2	1	2	–	2	1	1	2	1	2	3	2	3
CO2	3	3	3	1	2	–	3	3	2	–	2	3	3	3	3
CO3	3	2	3	1	2	–	2	1	2	2	3	3	3	3	3
CO4	3	3	3	1	2	–	2	3	1	–	1	3	3	3	1
CO5	3	1	3	1	2	–	1	2	1	2	1	2	3	3	3
AVG	3	2	2.8	1	2	–	2	2	1.4	1.2	1.6	2.6	3	2.8	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T44- LINEAR CONTROL SYSTEMS [Total no. of Students: 10] [2<sup>rd</sup> Year, 4<sup>th</sup> Semester]

Course Prerequisite: Knowledge of Control System

### Course Objective:

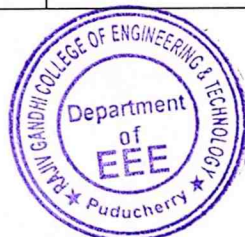
1. To understand the various facts & modeling of systems
2. To ascertain various attributes of dynamic systems like stability
3. To understand and analyze stability of systems
4. To design controllers for linear dynamic systems.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Able to understand the different types of system modeling	L2
CO2	Able to understand the behavior of a given system under various test signal	L2
CO3	Analyze the system dynamics by graphical representation	L4
CO4	Design of a system for a specified phase & gain margin	L5
CO5	Understand the concept of state-variable approach to modeling of dynamic systems	L2

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability





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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PS O1	PSO 2	PSO 3
CO1	3	3	–	2		–	1	–	3	–	–	2	3	3	3
CO2	3	3	–	3		–	–	–	3	–	–	–	3	3	3
CO3	3	3	3	3	2	1		–	3	–	–	–	3	3	3
CO4	3	2	3	3	2	–		–	3	–	–	–	3	3	1
CO5	3	3	3	–	2	2	1	–	3	–	–	–	3	3	3
AVG	3	2.8	1.8	2.2	1.2	0.6	0.2	–	3	–	–	0.2	3	3	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T45- PULSE AND DIGITAL CIRCUITS [Total no. of Students: 10] [2<sup>rd</sup> Year, 4<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge of combinational and sequential circuits.

### Course Objective:

1. To understand the concept & to build any combinational circuit with logic gates and exclusively using universal gates
2. To know the difficulties involved in the design of asynchronous sequential circuits
3. To understand the operation of switching circuits with discrete components like BJT, FET, UJT versions
4. To able model and design any type of digital circuits.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understand the principles of digital logic circuits, including Boolean algebra, logic gates, and combinational and sequential logic design.	L2
CO2	Analyze pulse circuits involving different types of waveforms, including square waves, triangular waves, and pulses generated by multivibrators.	L4
CO3	Design and implement circuits to generate and manipulate pulse waveforms using components such as flip-flops, timers.	L5
CO4	Develop proficiency in designing and analyzing counter circuits for frequency division and timer circuits for time delay applications.	L5
CO5	Design and implement of Synchronous sequential circuits with State reduction technique	L5

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage	PSO2	Problem Solving Skills
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics	PSO3	Computing and Research Ability
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	2	1	–	–	–	–	3	–	–	2	2	2	3
CO2	3	3	2	1	–	–	–	–	3	–	–	–	3	3	3
CO3	3	3	3	1	1	–	–	–	3	–	–	–	3	3	3
CO4	3	2	3	1	–	–	–	–	3	–	–	–	1	3	1
CO5	3	3	3	1	1	–	–	–	3	–	–	–	3	3	3
AVG	3	3	2.6	1	0.4	–	–	–	3	–	–	0.4	2.4	2.8	2.6



  
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T46- DATA STRUCTURES & OBJECT ORIENTED PROGRAMMING [Total no. of Students: 10] [2<sup>nd</sup> Year, 4<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge of object-oriented programming (OOP), including classes, objects, inheritance, polymorphism, and encapsulation.

### Course Objective:

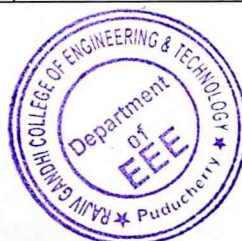
1. To understand the power of object-oriented programming over structured programming
2. To understand the C++ concepts and its methodologies
3. To develop C++ classes for simple applications targeted for electrical and electronics engineering.
4. To understand the features of the platform independent object-oriented programming language-JAVA.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understand the core concepts of Object-Oriented Programming (OOP) and their advantages over structured programming.	L2
CO2	Apply advanced OOP techniques such as function and operator overloading, inheritance, and polymorphism in programming.	L5
CO3	Differentiate between Java and C++, and proficiently use Java for programming by understanding its data types, operators, control flow, and basic object-oriented concepts.	L4
CO4	Utilize Java's packages, interfaces, and exception handling mechanisms to build robust and modular applications.	L2
CO5	Implement multi-threaded programming and applet-based applications in Java, understanding their life cycles and interactions	L4

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes			
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems		
PO2	Problem analysis				
PO3	Design/development of solutions				
PO4	Conduct investigations of complex problems				
PO5	Modern tool usage				
PO6	The engineer and society				
PO7	Environment and sustainability				
PO8	Ethics				
PO9	Individual and team work			PSO2	Problem Solving Skills
PO10	Communication				
PO11	Project management and finance				
PO12	Life-long learning			PSO3	Computing and Research Ability





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	1	3	–	1	1	–	–	3	–	–	1	2	2	3
CO2	3	1	3	–	2	2	–	–	3	–	–	–	3	3	3
CO3	3	3	3	–	1	2	–	–	3	–	–	–	3	3	3
CO4	3	3	3	–	2	2	–	–	3	–	–	–	3	3	3
CO5	3	1	3	–	2	2	–	–	3	–	2	–	3	3	3
AVG	3	1.8	3	–	1.6	1.8	–	–	3	–	0.4	0.2	2.8	2.8	3



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE P41 -ELECTRICAL MACHINES LAB-II [Total no. of Students: 10] [2<sup>nd</sup> Year, 4<sup>th</sup> Semester]

**Course Prerequisite:** knowledge on performance behavior of AC electrical machines & its application

### Course Objective:

1. To test and evaluate the performance of induction and synchronous machines by conducting appropriate experiments
2. To learn different methods to predetermine the characteristics of single phase and three phase induction motors
3. To get familiar with different types of speed control of induction motor.
4. To understand the synchronization of three phase alternator with infinite bus bar.
5. To learn the assembling of different types of AC machines.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Enable the performance of 3 phase Induction motors under no load and load conditions	L3
CO2	Test the load performance of different types of 3 phase induction motors	L3
CO3	Predetermine the load performance of Alternator	L6
CO4	Analyze the Speed control of Induction machines	L4
CO5	Develop proficiency in measuring and analyzing Synchronous machine parameters	L4

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes			
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems		
PO2	Problem analysis				
PO3	Design/development of solutions				
PO4	Conduct investigations of complex problems				
PO5	Modern tool usage				
PO6	The engineer and society				
PO7	Environment and sustainability				
PO8	Ethics				
PO9	Individual and team work			PSO2	Problem Solving Skills
PO10	Communication				
PO11	Project management and finance				
PO12	Life-long learning			PSO3	Computing and Research Ability





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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	–	1	–	1	3	–	–	–	3	3	3
CO2	3	3	2	2	–	–	–	–	3	–	–	–	3	3	3
CO3	3	3	3	2	1	–	–	–	3	–	–	–	3	3	3
CO4	3	3	2	2	–	–	–	–	3	–	–	–	3	3	3
CO5	3	2	3	2	2	1	–	1	3	–	–	–	3	3	3
AVG	3	2.6	2.6	2	0.6	0.4	–	0.4	3	–	–	–	3	3	3



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE P41-ELECTRONICS LAB – II [Total no. of Students: 10] [2<sup>rd</sup> Year, 4<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge of practical experience in designing, constructing, and testing electronic circuits and systems.

### Course Objective:

1. To design and analyze the operation of some of the basic analog electronic circuits such as amplifiers, oscillators and multivibrators.
2. To understand the basic logic gates and flip-flops which help them to build any digital electronic circuits
3. To design the digital circuits
4. To design different types of analog and digital electronic circuits.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Analyze analog and digital circuits using electronic components	L4
CO2	Design and implement digital circuits using logic gates, flip-flops, counters, registers	L5
CO3	Understand the concept of logic gates and to verify with De“Morgan laws using logic gates, implementation of basic gates using universal gates.	L2
CO4	Design the circuit of adders, subtractors and combination of all logic circuits using K-map simplification.	L5
CO5	Design of various transistor biasing circuits, series and shunt regulators using zener diodes and half wave and fullwave rectifiers with and without filters.	L5

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance	PSO2	Problem Solving Skills
PO12	Life-long learning		
		PSO3	Computing and Research Ability







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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	3	1	-	-	-	-	3	-	-	1	3	3	3
CO2	3	3	2	1	-	-	-	-	3	-	-	-	3	3	3
CO3	3	3	3	2	1	-	-	-	3	-	-	-	3	3	3
CO4	3	3	2	2	1	-	-	-	3	-	-	-	3	3	1
CO5	3	2	3	2	2	-	-	-	3	-	-	-	3	3	3
AVG	3	2.6	2.	1.6	0.8	-	-	-	3	-	-	0.2	3	3	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE P43- DATA STRUCTURES & OBJECT ORIENTED PROGRAMMING LAB [Total no. of Students: 10] [2<sup>nd</sup> Year, 4<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge about object oriented programming.

### Course Objective:

1. To give hands on training with the C++ and Java compilers to the student.
2. To develop their own codes, develop skills in debugging, testing and finally validating the programs.
3. To excel in writing object-oriented programs using C++ and Java.
4. To interface and develop single and multi-threaded applications.
5. To develop their own user defined packages.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Develop proficiency in programming fundamentals using an object-oriented programming language	L4
CO2	Understand and apply fundamental object-oriented programming (OOP) concepts.	L2
CO3	Utilize debugging tools and techniques to identify and resolve programming errors	L5
CO4	Apply fundamental of JAVA with applications and Handling Strings in JAVA for Simple Package creation	L2
CO5	Gain proficiency in creating, starting, pausing, resuming, and terminating threads in JAVA	L3

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability





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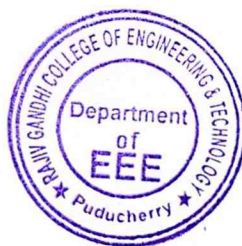
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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	2	1	2	1	1	1	–	–	3	–	–	1	2	2	3
CO2	2	1	2	–	1	–	–	–	3	–	–	–	3	3	3
CO3	2	1	2	2	1	–	–	–	3	–	–	–	3	3	3
CO4	2	2	2	–	1	–	–	–	3	–	–	–	1	3	1
CO5	2	3	–	2	3	–	–	–	3	–	–	–	3	3	3
AVG	2	1.6	1.6	1	1.2	0.2	–	–	3	–	–	0.2	2.4	2.8	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T61- POWER SYSTEM ANALYSIS [Total no. of. Students: 14] [3rdYear, 6th Semester]

**Course Prerequisite:** Knowledge of Power System Analysis and different Methods.

#### Course Objectives:

1. To create computational models for power system using per unit analysis.
2. To perform load flow analysis using Gauss Seidal and Newton-Raphson methods.
3. To analyze the sequence network using symmetrical components.
4. To impart the knowledge about symmetrical and unsymmetrical faults in power system.
5. To analyze the stability problems in power system.

#### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Compute the reactance diagram and network matrices.	L4
CO2	Apply the iterative techniques to solve the power flow analysis used in power system planning.	L3
CO3	Analyze the sequence network by using positive, negative and zero sequence network.	L4
CO4	Analyze the symmetrical and unsymmetrical faults.	L4
CO5	Analyze the steady state, transient and dynamic stability concepts of a power system.	L4

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	3	1	3	3	3	–	3	2	1	3	1	3	3
CO2	3	3	1	2	3	3	–	3	3	–	3	3	1	3	3
CO3	3	3	1	3	–	3	3	–	3	–	–	3	1	3	3
CO4	3	3	2	3	–	3	2	–	3	–	–	3	1	3	1
CO5	3	3	2	1	–	3	1	–	3	–	2	3	1	3	3
AVG	3	3	1.8	2	1.2	3	2.4	0.6	3	0.4	1	3	1	3	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

EE T62- UTILIZATION OF ELECTRICAL ENERGY [Total no. of. Students: 14] [3<sup>th</sup> Year, 6<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge of proper utilization of electrical energy.

### Course Objective:

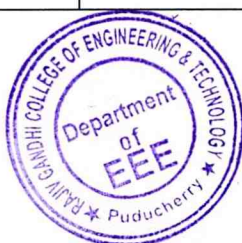
1. To design optimized illumination system for domestic and industrial applications.
2. To acquire knowledge about the different types of heating and welding.
3. To make awareness in the usage of refrigeration and air conditioning system.
4. To familiarize with the construction and working of traction systems.
5. To impart the knowledge on electroplating techniques and operations of batteries.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Develop a clear idea on lighting requirement for domestic and industrial needs in an efficient way.	L3
CO2	Analysis the different types of heating and welding schemes used in the industries	L4
CO3	Repair the minor faults that occurs in refrigerator and in air conditioning system	L4
CO4	Analyze the speed-time characteristics and performance of the electric traction.	L4
CO5	Calculate the power requirement and efficiency of domestic appliances.	L4

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage	PSO2	Problem Solving Skills
PO6	The engineer and society		
PO7	Environment and sustainability	PSO3	Computing and Research Ability
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		







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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	2	-	-	-	-	2	-	-	-	-	3	3	3
CO2	3	2	2	-	-	-	-	3	-	-	-	-	3	3	3
CO3	3	2	2	-	-	-	-	2	-	-	-	-	3	3	3
CO4	3	2	2	-	-	-	-	3	-	-	-	-	3	3	1
CO5	3	2	2	-	-	-	-	2	-	-	-	-	3	3	3
AVG	3	2	2	-	-	-	-	2.4	-	-	-	-	3	3	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T63-MICROPROCESSORS AND MICROCONTROLLERS [Total no. of Students: 14] [3<sup>rd</sup> Year, 6<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge of Microprocessors and Microcontrollers & its application

### Course Objective:

1. To comprehend the structural and functional aspects of different microprocessors.
2. To develop a strong foundation in assembly-level programming for the 8085 microprocessor and 8051 microcontrollers.
3. To acquire practical skills in interfacing microprocessors with various real-time devices and peripherals.
4. To cultivate the ability to write and debug C programs tailored for the 8051 microcontroller.
5. To design and develop integrated systems based on microprocessors and microcontroller.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Recognise the structure of 8085, Z-80 & MC 6800 microprocessor architecture and pin details.	L2
CO2	Apply fundamentals of assembly-level programming of 8085 microprocessor and 8051 microcontroller.	L3
CO3	Execute real-time interfaces with microprocessor.	L3
CO4	Develop skills for writing C programs for 8051 microcontroller.	L6
CO5	Design microprocessor and microcontroller-based systems.	L6

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society	PSO2	Problem Solving Skills
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work	PSO3	Computing and Research Ability
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	–	3	2	3	2	–	–	–	–	–	2	3	3	3
CO2	3	–	2	2	3		–	–	–	–	–	2	3	3	3
CO3	3	–	1	–	3	2	–	–	–	–	–	2	3	3	3
CO4	3	1	3	2	3	2	–	–	–	–	–	2	3	3	1
CO5	3	–	3	2	3	2	–	–	–	–	–	2	3	3	3
AVG	3	0.2	2.4	1.6	3	1.6	–	–	–	–	–	2	3	3	2.6



  
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T64 -ELECTRICAL MACHINE DESIGN [Total no. of. Students: 14] [3<sup>th</sup> Year, 6<sup>th</sup> Semester]

**Course Prerequisite:** Understand the fundamentals of design of machines

### Course Objective:

1. To understand the design considerations, thermal rating, insulation requirements and magnetic circuit calculations of static and rotating electrical machines.
2. To design aspects of various parts of DC machines.
3. To design aspects of transformer with minimum cost.
4. To design aspects of various parts of induction motor.
5. To design aspects of synchronous machines.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Design the machines with proper thermal rating and insulation requirements	L6
CO2	Analyze and evaluate the various design parameters of a DC machine for variable speed motor applications in industry.	L4
CO3	Analyze the various parameters of transformer and to design distribution and power transformers for real time applications.	L4
CO4	Analyze and formulate the suitable design for three phase induction motor	L4
CO5	Apply the design concepts of Synchronous machines and CAD	L4

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes			
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems		
PO2	Problem analysis				
PO3	Design/development of solutions				
PO4	Conduct investigations of complex problems				
PO5	Modern tool usage				
PO6	The engineer and society				
PO7	Environment and sustainability				
PO8	Ethics				
PO9	Individual and team work			PSO2	Problem Solving Skills
PO10	Communication				
PO11	Project management and finance				
PO12	Life-long learning			PSO3	Computing and Research Ability





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	2	2	2	-	-	-	-	-	-	1	2	2	3
CO2	3	2	2	3	2	-	-	-	-	-	-	-	3	3	3
CO3	3	3	3	3	2	-	-	-	-	-	-	-	3	3	3
CO4	3	3	3	3	2	-	-	-	-	-	-	-	1	3	1
CO5	3	3	3	2	2	-	-	-	-	-	-	-	3	3	3
AVG	3	2.8	2.6	2.6	2	-	-	-	-	-	-	0.2	2.4	2.8	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T65- DIGITAL SIGNAL PROCESSING [Total no. of. Students: 14] [3<sup>th</sup> Year, 6<sup>th</sup> Semester]

Course Prerequisite: Knowledge of signal processing

### Course Objective:

1. To introduce the idea of signals and systems in time and frequency domain.
2. To introduce fundamental principles and applications of signals and filters.
3. To provide applications of signal processing.
4. To make understand the basic concepts of signal filter techniques.
5. To give basic ideas on implementation of DFT and FFT.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Analyze the classifications of signals and systems in the time and frequency domains.	L3
CO2	Perform the stability analysis of discrete time system	L3
CO3	Acquire knowledge on spectral analysis of signals.	L3
CO4	Design, analyze and compare digital filters for processing of discrete time signals.	L3
CO5	Acquire knowledge on DSP architecture and implement DFT and FFT Algorithms in DSP.	L4

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society	PSO2	Problem Solving Skills
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work	PSO3	Computing and Research Ability
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	3	3	1	–	–	–	–	–	–	1	3	2	3
CO2	3	2	3	3	1	–	–	–	–	–	–	1	3	2	3
CO3	3	2	3	3	1	–	–	–	–	–	–	1	3	2	3
CO4	3	2	3	3	1	–	–	–	–	–	–	1	3	2	1
CO5	3	2	3	3	1	–	–	–	–	–	–	1	3	2	3
AVG	3	2	3	3	1	–	–	–	–	–	–	1	3	2	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE E05- ELECTRICAL SAFETY AND QUALITY MANAGEMENT [Total no. of. Students: 14] [3<sup>rd</sup> Year, 6<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge of Total Quality and Control Management

### Course Objective:

1. To familiarize the Indian Electricity Rules and Act related with electrical safety.
2. To provide a knowledge about electrical shocks and safety precautions.
3. To create awareness of the electrical safety associated with installation of electrical equipment.
4. To analyze different Hazardous areas for electrical safety.
5. To expose knowledge about necessity of safety policy and safety management.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Understand the Indian Electricity Rules and their significance	L2
CO2	Understand the Earthing of system neutral, Electrical Safety in Residential, Commercial and Agricultural Installations	L2
CO3	Understand the Safety during Installation, Testing, Commissioning, Operation and Maintenance	L2
CO4	Analyze the electrical safety of equipment enclosure for various hazardous gases and vapours in Hazardous Areas	L4
CO5	Understand the need of Total Quality and Control Management Power factor in Electrical Safety	L2

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage	PSO2	Problem Solving Skills
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics	PSO3	Computing and Research Ability
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	–	3	–	3	3	2	–	2	–	2	3	2	2	3
CO2	3	3	–	3	3	3	3	–	2	3	2	3	3	3	3
CO3	3	–	3	–	2	3	2	2	–	–	–	3	3	3	3
CO4	3	–	–	–	3	3	3	–	2	3	–	3	1	3	1
CO5	3	3	3	–	2	3	2	–	3	–	2	3	3	3	3
AVG	3	1.2	1.8	0.6	2.6	3	2.4	0.4	1.8	1.2	1.2	3	2.4	2.8	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE P61- POWER ELECTRONICS LABORATORY [Total no. of Students: 14] [3<sup>rd</sup> Year, 6<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge of power converters & its application

### Course Objective:

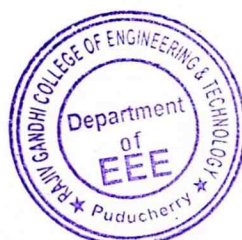
1. To introduce the concepts involved in power semiconductor devices and its characteristics and to understand the basics of triggering circuits.
2. To analyze the basic Power electronic circuit topologies including AC-DC, DC-DC, DC-AC and AC-AC converters.
3. To enable to do simulation of Converter circuits and experimentally verify the results.
4. To analyze the operation of the DC and AC drives.
5. To introduce the industrial control of power electronic circuits as well as safe electrical connection and measurement practices.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Analyze the fundamental operations of power semiconductor devices and its characteristics.	L3
CO2	Demonstrate the operation of various power converters circuits.	L4
CO3	Illustrate the operating characteristics of AC and DC Drives.	L4
CO4	Acquire knowledge on design and implementation of Microcontroller based control schemes for electrical drives.	L5
CO5	Design and implement the closed loop controllers for converters	L5

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	–	–	2	–	–	–	2	–	–	2	3	2	3
CO2	3	3	1	2	3	–	–	–	2	–	–	2	3	3	3
CO3	3	3	3	2	3	–	–	–	2	–	–	2	3	3	3
CO4	3	3	3	1	2	–	–	–	2	2	2	2	3	3	3
CO5	3	3	2	2	3	–	–	–	2	2	–	2	3	3	3
AVG	3	3	1.8	1.4	2.6	–	–	–	2	0.8	0.4	2	3	2.8	3



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE P62-MICROPROCESSORS AND MICROCONTROLLERS LAB [Total no. of Students: 14] [3<sup>rd</sup> Year, 6<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge of Microprocessors and Microcontrollers & its application

### Course Objective:

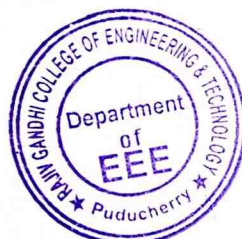
1. To understand the Fundamentals of Microprocessors and Microcontrollers.
2. To develop Skills in Writing and Executing Assembly Language Programs.
3. To learn to Implement Complex Data Transfer and Series Generation Operations
4. To gain Practical Experience in Peripheral Interfacing.
5. To develop Real-World Problem-Solving Skills.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Perform arithmetic operations and code conversions using 8085 microprocessor and 8051 microcontroller.	L2
CO2	Implement block data transfer operations and series generation using 8085 microprocessor.	L3
CO3	Develop digital clock simulations and message display programs using 8085 microprocessor.	L3
CO4	Interface peripherals like traffic lights, keyboards, displays, ADC/DAC, and stepper motors with 8085 microprocessor and 8051 microcontroller.	L6
CO5	Implement array operations such as searching and sorting using 8051 microcontroller.	L6
CO6	Develop hands-on skills to solve real-world problems using microprocessor and microcontroller-based systems.	L5

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage	PSO2	Problem Solving Skills
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics	PSO3	Computing and Research Ability
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	2	2	3	–	–	–	2	–	–	2	3	2	3
CO2	3	3	2	2	3	–	–	–	2	–	–	2	3	3	3
CO3	3	3	3	2	3	–	–	–	2	–	–	2	3	3	3
CO4	3	3	3	2	3	–	–	–	2	2	2	2	3	3	3
CO5	3	3	2	2	3	–	–	–	2	2	-	2	3	3	3
CO6	3	3	3	3	3	2	2	2	2	3	3	3	3	3	3
AVG	3	3	2.5	1.67	3	0.34	0.34	0.34	2	1.17	0.84	2.17	3	3	3



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# RAJIV GANDHI COLLEGE OF ENGINEERING AND TECHNOLOGY

Pondy-Cuddalore Main Road, Kirumampakkam, Puducherry – 607 403.

Affiliated to Pondicherry University and Approved by AICTE, New Delhi

## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

HS P63- GENERAL PROFICIENCY– II [Total no. of Students: 14] [3<sup>rd</sup> Year, 6<sup>th</sup> Semester]

Course Prerequisite: Knowledge on group discussions, resumes, adapting to corporate setup and aptitude

### Course Objective:

1. To equip the students with requisite skill sets and make them industry-ready/fit.
2. To develop their language prowess and become employable.
3. To understand the needs of the industry and enhance their employability/career prospectus.
4. To groom the students holistically and making their transition from college to corporate world.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Develop and enhance verbal and written communication skills necessary for effective academic and professional interactions.	L3
CO2	Develop proficiency in using technology tools and applications relevant to academic and professional contexts.	L3
CO3	Enhance abilities to work collaboratively in diverse teams, demonstrating interpersonal skills and leadership qualities.	L3
CO4	Demonstrate professionalism in academic settings, including punctuality, respect for others, and adherence to academic and professional standards	L5
CO5	Improve proficiency in quantitative reasoning, including mathematical problem-solving and data analysis.	L3

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability





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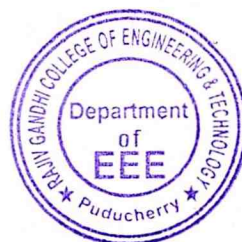
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	1	-	-	-	1	1	-	2	2	2	-	2	2	1	1
CO2	1	-	-	1	1	1	-	2	2	3	-	2	2	1	1
CO3	1	-	-	1	1	1	-	2	2	3	-	2	2	1	1
CO4	1	-	-	1	1	1	-	3	2	2	-	2	2	1	1
CO5	1	3	1	1	1	-	-	3	2	2	-	2	2	1	1
AVG	1	0.6	0.2	0.8	1	0.8	-	2.8	2	2.4	-	2	2.4	1	1



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE T81- PROTECTION AND SWITCHGEAR [Total no. of. Students: 16] [4<sup>th</sup> Year, 8<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge of different type of power system protection

### Course Objective:

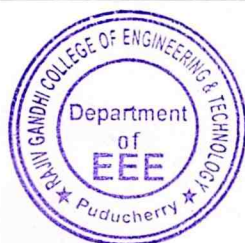
1. To understand the different protection zones and protection schemes in power system.
2. To impart knowledge on various types of relays including Distance and differential protection schemes.
3. To impart knowledge on protection schemes for generator, transformer, motor, feeder and transmission lines.
4. To acquire knowledge on various circuit breakers (AC and DC) used in power systems.
5. To acquaint the various types of surge protection and earthing.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Identify the equipment's for protection scheme on Power Systems.	L2
CO2	Analyze the different applications of the relays in power system.	L4
CO3	Interpret the protection of transformer, Bus bar and transmission line.	L3
CO4	Comprehend the various circuit breakers (AC and DC) used in power system.	L2
CO5	Analyze the protection against over voltages and working of lightning arrester.	L4

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability





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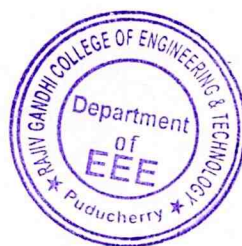
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	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
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CO2	3	3	–	2	–	–	–	1	2	–	–	–	3	3	3
CO3	3	–	2	–	2	–	–	1	2	–	–	–	3	3	3
CO4	3	–	2	–	2	–	–	1	2	–	–	–	3	3	1
CO5	3	–	3	–	–	–	–	1	2	–	–	–	3	3	3
AVG	3	1.2	1.4	0.4	0.8	–	–	1	2	–	–	–	3	3	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE E12- RENEWABLE ENERGY SOURCES [Total no. of. Students: 16] [4<sup>th</sup> Year, 8<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge of different type Renewable Energy & its application

### Course Objective:

1. To impart knowledge on renewable energy sources and technologies.
2. To gain adequate knowledge on variety of issues in harnessing renewable energy sources.
3. To outline about the alternate renewable energy sources for both domestics and industrial applications.
4. To provide knowledge about grid connectivity in renewable energy systems.
5. To provide in-depth knowledge in the key concepts of energy policies.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Analyze the national and international energy scenario of renewable energy Sources.	L4
CO2	Analyze the aerodynamics of wind turbines and calculate their energy production.	L4
CO3	Analyze electrical power generation from biomass, geothermal, tidal, wave etc.	L4
CO4	Analyze technical and sustainability issues involved in the integration of renewable energy systems.	L4
CO5	Compare the cost economics of using renewable energy sources with non-renewable energy sources.	L2

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability







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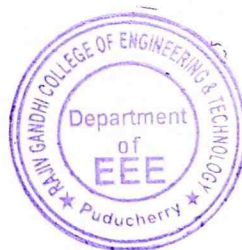
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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
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CO2	3	2	2	3	2	3	2	3	2	3	2	3	3	3	3
CO3	3	2	3	3	2	3	2	3	2	3	2	3	3	3	3
CO4	3	2	3	3	2	3	2	3	2	3	2	3	3	3	1
CO5	3	2	2	3	2	3	-	3	2	3	2	3	3	3	3
AVG	3	1.8	2.4	3	2	3	1.4	3	2	3	2	3	3	3	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE E15- HIGH VOLTAGE DC TRANSMISSION [Total no. of. Students: 16] [4<sup>th</sup> Year, 8<sup>th</sup> Semester]

Course Prerequisite: Knowledge of HVDC transmission systems

### Course Objective:

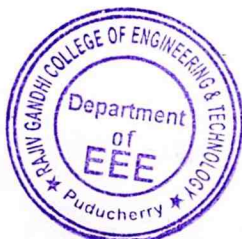
1. To provide an overview of High voltage techniques.
2. To Understand the power converters which are the building block of the HVDC systems
3. To understand the various types of faults and protection..
4. To understand the filters and elimination of harmonics
5. To provide on multi terminal HVDC systems and their different types.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Compare AC & DC systems and different types of DC links, Modern trends of HVDC transmission system	L2
CO2	Analyze the Greatz circuits with various conditions	L4
CO3	Describe various fault and protection techniques	L1
CO4	Analyze the harmonics and Design the filters in HVDC	L3
CO5	Analyze the operation of various shunt devices and types of MTDC System	L4

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		
		PSO2	Problem Solving Skills
		PSO3	Computing and Research Ability





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	–	–	3	–	2	–	3	–	–	2	3	3	3
CO2	3	3	3	3	3	–	–	–	3	–	–	2	3	3	3
CO3	3	3	–	3	2	–	2	–	3	–	–	2	3	3	3
CO4	3	2	3	2	–	–	2	–	3	–	–	2	3	3	1
CO5	3	3	3	–	2	–	3	–	3	–	–	2	3	3	3
AVG	3	2.8	1.8	1.6	2	-	1.8	-	3	-	-	2	3	3	2.6



  
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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE PW8- PROJECT WORK PHASE – II [Total no. of Students: 16] [4<sup>th</sup> Year, 8<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge of different field of Electrical & Electronic subject

### Course Objective:

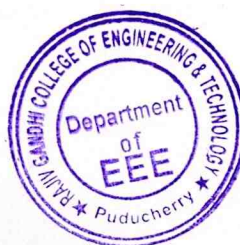
1. To develop students innovative ideas for the prototype design.
2. To develop the skills to solve a specific problem right from its identification and literature review till the successful solution of the same.
3. To encourage the students to work as a team to solve the engineering problem
4. To train the students for the preparation of project reports.
5. To train the students to defend reviews and viva voce examination.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Identify the problem statement for the project work through the literature survey.	L3
CO2	Choose the proper components as per the requirements of the design/system.	L2
CO3	Apply the acquainted skills to develop final model/system.	L4
CO4	Estimate, plan and execute the project as a team.	L3
CO5	Defend the finding and conclude with oral/written reports.	L3

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage	PSO2	Problem Solving Skills
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics	PSO3	Computing and Research Ability
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		





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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
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CO2	3	3	3	2	3	3	2	1	1	3	2	2	3	3	3
CO3	3	2	2	1	3	3	2	1	3	3	2	2	3	3	3
CO4	3	3	3	1	3	3	2	1	2	3	2	2	1	3	1
CO5	3	3	3	1	3	3	2	1	1	3	2	2	3	3	3
AVG	3	2.6	2.6	1.4	3	3	2	1	2	3	2	2	2.4	2.8	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE P81-COMPREHENSIVE VIVA VOICE [Total no. of Students: 16] [4<sup>th</sup> Year, 8<sup>th</sup> Semester]

Course Prerequisite: Knowledge of different field of Electrical & Electronic subject

### Course Objective:

1. To acquire knowledge and skills to face the interview panel.
2. To equip the students with analytical and evaluation abilities
3. To respond to impromptu questions by the panel members.
4. To make the students to face the expert panel and present the knowledge, skills and problems in the most efficient way.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Demonstrate the application of the knowledge acquired in all subjects.	L2
CO2	Understand the practical difficulties in applying the various forms of solutions to find the feasible solution.	L3
CO3	Solve the problems and assess the implications of various forms of solutions.	L2
CO4	Make effective presentation of different topics learnt before the expert problem.	L3
CO5	Respond to the questions by the panel members	L5

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society	PSO2	Problem Solving Skills
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work	PSO3	Computing and Research Ability
PO10	Communication		
PO11	Project management and finance		
PO12	Life-long learning		







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### CO Mapping with PO and PSO

	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
CO/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
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CO5	3	1	1	3	–	3	–	1	1	2	2	2	3	3	3
AVG	3	1	0.8	3	–	3	–	1	1	2	2	2	2.4	2.8	2.6



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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

### COURSE OBJECTIVES

EE P82-PROFESSIONAL ETHICAL PRACTICE [Total no. of Students: 16] [4<sup>th</sup> Year, 8<sup>th</sup> Semester]

**Course Prerequisite:** Knowledge of good ethical practices

### Course Objective:

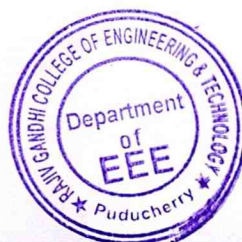
1. To enable the students to create an awareness on Engineering Ethics and Human Values,
2. To instill Moral and Social Values and Loyalty and to appreciate the rights of others.
3. To develop a firm ethical base.
4. To make the students to realize the significance of ethics in professional environment.
5. To acquaint students with latest intellectual property rights.

### Course Outcomes:

COs	Upon successful completion of this course, students should be able to:	LEVEL
CO1	Apply ethics in society.	L3
CO2	Discuss the ethical issues related to engineering.	L2
CO3	Act as a responsible Experimenter and to follow the codes of Ethics.	L3
CO4	Realize the responsibilities and rights in the society.	L2
CO5	Familiarize with the Multinational Corporations and its Social Responsibility.	L3

### PO AND PSO OVERVIEW

Program Outcomes		Program Specific Outcomes	
PO1	Engineering Knowledge	PSO1	Skilled Professional Electrical and Electronic Systems
PO2	Problem analysis		
PO3	Design/development of solutions		
PO4	Conduct investigations of complex problems		
PO5	Modern tool usage		
PO6	The engineer and society		
PO7	Environment and sustainability		
PO8	Ethics		
PO9	Individual and team work		
PO10	Communication		
PO11	Project management and finance	PSO2	Problem Solving Skills
PO12	Life-long learning		
		PSO3	Computing and Research Ability





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	Engineering knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long learning	Skilled professional Electrical and Electronic system	Problem solving Skills	Computing and Research Ability
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CO5	3	–	–	–	1	2	1	–	1	2	2	2	3	3	3
AVG	3	0.2	–	–	1	1.6	1	1.8	2	2	2	2	2.4	2.8	2.6



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