

Course Code – 214305  
Electrical & Electronics Technology

Credit Points	Teaching Hrs/Week	Practical Hrs/Week
5	3	2

Objective	<ul style="list-style-type: none"> <li>• Understand the basic concepts of electrical machines &amp; Electronics Basics.</li> <li>• Understand the relevance of electrical machines as applied to industrial applications</li> </ul>
Prerequisites	Basic Electrical Engineering

Unit	Topic Name	Details	Hrs
1	<b>D.C. Machines</b>	Working principle of d.c. machines, constructional features, types of d.c. machines, generating action, e.m.f equation. (Descriptive treatment only). Motoring action, torque equation of d.c. motor, characteristics of d.c. motor, back e.m.f in d.c. motor, starters, methods for speed control of d.c. motors.	7
2	<b>Electrical Power Measurement</b>	Measurement of active and reactive power in a three phase balanced circuit by using one, two and three Wattmeter methods.	3
3	<b>Transformer</b>	Transformers: Introduction, Phasor diagram of a Transformer, Concept of Equivalent circuit of a single phase transformer; OC and SC test to determine transformer efficiency, regulation. Welding transformer, CT and PT, study of a typical distribution transformer and accessories	5
4	<b>Three Phase Induction Motor &amp; Single phase motors</b>	Concept of rotating magnetic field, working principle of three phase induction motors, constructional features, torque equation, torque slip characteristic, torque ratios, power stages, efficiency; types of starters, conventional methods of speed control, applications of Induction motor. Working principle of single phase induction motor.	7
5	<b>Industrial Electronics Controllers</b>	SCR, TRIAC, MOSFET, IGBT, Characteristics and simple applications like controlled rectifiers, triggering circuits using DIAC/ UJT and digital logic, Transistor as an amplifier, power supply protection circuits (over voltage, thermal shutdown and current limiting), Block diagram of UPS.	7

6	<b>Op-Amps and Digital Electronics</b>	a) Introduction to Operational amplifiers, inverting and non-inverting type. b) Transistor as a switch, binary logic, Basic gates, Boolean algebra, half adder and full adder, Stepper motors and their drives, Introduction to NC, CNC and PLC.	7
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Lab/ Term Work
a. 1 Speed control of a d.c. shunt motor by armature voltage and flux control methods. b. Load test on a d.c. shunt motor. c. Load test on a d.c. series motor d. Load test on three phase induction motor. e. Study of Transistor as amplifier. f. Study of Op-Amps. g. Study of Logic gates. h. Application of SCR as a controlled rectifier. i. Study of Stepper motor controller. j. Study of PLC.

Text Books	<ul style="list-style-type: none"> <li>• Electrical machinery and transformer by Irvin Kosow, Prentice Hall</li> <li>• Thomas L Floyd Electronics Devices, 5<sup>th</sup> Edition Pearson, India, 1999.</li> </ul>
Reference Books	<ul style="list-style-type: none"> <li>• Process Instrumentation Hand Book. By Cinsidine MGH</li> <li>• Computer Based Industrial Control By Krishna Kant PHI-               <ul style="list-style-type: none"> <li>• Mechatronics – by Bolten.</li> </ul> </li> <li>• Allen Mottershed, Electronics Devices and circuits, Twentieth Indian edition, New Delhi ,1998.</li> <li>• Digital Principles and Application By Albert Paul Malvino, Donald P Leach</li> </ul>
Related Websites	

Examination Scheme	Internal Assessment – 40 marks	
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	Term Work – 25 marks	
	Final Theory Paper – 60 marks	