

Program : Diploma in Mechanical Engineering/Manufacturing Technology	
Course Code : 3028	Course Title: Electrical and Electronics Lab
Semester : 3	Credits: 1.5
Course Category: Program Core	
Periods per week: 3 (L:0, T:0, P:3)	Periods per semester: 45

Course Objectives:

This course is helping the student to attain the following industry identified competency to:

- Familiarize electrical energy and its application in mechanical engineering.
- Identify electronics components and its familiarization.

Course Prerequisites:

Topic	Course Code	Course Name	Semester
Knowledge of Physics		Applied Physics I&II	1&2
Basics of mathematics		Mathematics I&II	1&2

Course Outcomes:

On completion of the course, the student will be able to:

CO _n	Description	Duration (Hours)	Cognitive level
CO1	Select appropriate instruments and methods for measuring voltage, current, resistance and power in a given circuit	12	Applying
CO2	Develop simple circuits in open conduit system for domestic and motor wiring	9	Applying
CO3	Compute performance characteristics of AC motor and single-phase transformer using direct loading method	6	Applying
CO4	Construct rectifier circuits using the knowledge of various electronic components	12	Applying
	Lab Exam	6	

CO – PO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1				3			
CO2				3			
CO3				3			
CO4				3			

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

On completion of the course student will be able to:

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	Select appropriate instruments and methods for measuring voltage, current, resistance and power in a given circuit		
M1.01	Summarize the various electrical measuring instruments and its measurements.	1	Understanding
M1.02	Measure voltage, current and power in DC circuit with resistive load	2	Applying
M1.03	Measure voltage, current and power and power factor in 1-phase circuit with resistive and inductive load	3	Applying
M1.04	Measure power and power factor in three phase circuit using two wattmeter method	3	Applying
M1.05	Measure resistance (i) low resistance (ii) medium resistance by voltmeter and ammeter method	3	Applying
CO2	Develop simple circuits in open conduit system for domestic and motor wiring		
M2.01	Summarize the wiring accessories for wiring	3	Understanding
M2.02	Wire up circuits for (i) One lamp and one plug point controlled separately (ii) One lamp controlled by two switches in open conduit system	3	Applying
M2.03	Wire up a circuit in open conduit system for a three-phase motor connection	3	Applying
	Lab Exam I	3	
CO3	Compute performance characteristics of AC motor and single-phase transformer using direct loading method		

M3.01	Develop a circuit for computing the efficiency of an AC motor at different loads using direct loading method	3	Applying
M3.02	Develop a circuit for computing efficiency of a single-phase transformer at different loads using direct loading method	3	Applying
CO4	Construct rectifier circuits using the knowledge of various electronic components		
M4.01	Determine the value of the given resistor using digital multimeter to confirm with color code	1	Applying
M4.02	Connect resistors in series and parallel combination on bread board and measure its value in analytical method and compare using digital multimeter	2	Applying
M4.03	Connect capacitors in series and parallel combination on bread board and measure its value using digital multimeter	3	Applying
M4.04	Construct rectifier circuits (half wave and full wave) and observe the value by CRO	6	Applying
	Lab Exam II	3	

Text / Reference:

T/R	Book Title/Author
R1	Ritu Sahdev, Basic Electrical Engineering, Khanna Publishing House
R2	Mittle and Mittal, Basic Electrical Engineering, McGraw Education, New Delhi, 2015, ISBN : 978-0-07-0088572-5
R3	Saxena, S. B. Lal, Fundamentals of Electrical Engineering, Cambridge University Press, latest edition ISBN : 9781107464353
R4	Jegathesan, V., Basic Electrical and Electronics Engineering, Wiley India, New Delhi, 2015, ISBN : 97881236529513
R5	Sedha, R.S., A text book of Applied Electronics, S.Chand, New Delhi, 2008, ISBN-13: 9788121927833

Online Resources:

SI No	Website Link
1	www.circuitstoday.com
2	NPTEL >> Courses >> Electrical Engineering
3	http://www.electronicsteacher.com
4	https://www.allaboutcircuits.com/textbook/experiments