COURSE CONTENT

PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING LAB

I Semester : CSE

II Semester : CSM / CSD

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
24X0271	Foundation	0	0	2	1	40	60	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes:30				Total Classes:30		
Co requisites: Principles of Electrical and Electronics Engineering								

Course Overview: The Electrical and Electronics Engineering Laboratory provides a hands-on and simulation-based learning environment where students apply theoretical concepts using practical circuits and industry-standard software tools. The laboratory strengthens understanding of circuit design, electronic devices, and electrical systems by bridging theory with real-world experimentation and analysis.

Course Objectives

1. To analyze a given network by applying various electrical and electronics laws and network theorems
2. To know the response of electrical circuits for different excitations.
3. To calculate, measure and know the relation between basic electrical parameters.
4. To understand basic block sets of different simulation platform used in electrical/electronic circuit design.
5. To understand use and coding in different software tools used in electrical/ electronic circuit design.
6. To understand the simulation of electric machines/circuits for performance analysis.

Course Outcomes: After Completion of the Course, Students should be able to

1. Get an exposure to basic electrical laws.
2. Understand the response of different types of electrical circuits to different excitations.
3. Understand the measurement, calculation and relation between the basic electrical parameters.
4. Get an exposure to basic electronics devices and laws and Develop knowledge of software packages to model and program electrical and electronics systems.
5. Model different electrical and electronic systems and analyze the results by used software packages for simulation in laboratory experimentation.

List of experiments / demonstrations:

PART A: Conduct All the experiments

1. Verification of Ohms Law.
2. Verification of KVL and KCL.
3. Verification of super position theorem.
4. Verification of Norton's and Thevenin's Theorem.
5. Resonance in Series RLC circuit.

PARTB: Simulate any five from following experiments using Multisim / MATLAB Software:

1. Simulate V-I Characteristics of PN Junction Diode in a)Forward Bias and b)Reverse Bias.
2. Simulate V-I Characteristics of Zener Diode and Observe Zener as a Voltage Regulator.
3. Simulate Characteristics of Half Wave Rectifier
4. Simulate Characteristics of Full Wave Rectifier.
5. Simulate the Performance Characteristics of a DC Shunt Motor.

7. Simulate Kirchhoff's voltage law using basic series DC Circuit - 4 with resistors. Where Vs = 6 V, R1 = 100 Ω, R2 = 220 Ω, R3 = 1k Ω
8. Simulate Kirchhoff's current law using basic parallel DC Circuits - 5 with resistors. Where Vs = 6 V, R1 = 100 Ω, R2 = 220 Ω, R3 = 1k Ω

TEXT BOOKS:

1. D.P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 4th Edition, 2019.
2. MS Naidu and S Kamakshaiah, "Basic Electrical Engineering", Tata McGraw Hill, 2nd Edition, 2008.

REFERENCE BOOKS:

1. P. Ramana, M. Suryakalavathi, G.T.Chandrasheker,"Basic Electrical Engineering", S. Chand, 2 nd Edition, 2019.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009
3. M. S. Sukhija, T. K. Nagsarkar, "Basic Electrical and Electronics Engineering", Oxford, 1st Edition, 2012.
4. Abhijit Chakrabarthi, Sudipta Debnath, Chandan Kumar Chanda, "Basic Electrical Engineering", 2nd Edition, McGraw Hill, 2021.
5. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
6. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.

ELECTRONIC RESOURCES:

1. https://nptel.ac.in/courses/108/101/108101093/
2. https://ocw.mit.edu/courses/6-002-circuits-and-electronics-spring-2007/
3. https://www.allaboutcircuits.com/textbook/
4. https://www.electronics-tutorials.ws/
5. https://circuitverse.org/

MATERIALS ONLINE:

1. Lab Manual
2. Open-ended experiments