MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

DEPARTMENT OF CIVIL ENGINEERING

2030272- BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY

VISION

- The Civil Engineering department strives to impart quality education by extracting the innovative skills of students and to face the challenges in latest technological advancements and to serve the society.

MISSION

- To fulfill the promised vision through the following strategic characteristics and aspirations: Provide quality education and to motivate students towards professionalism.
- Address the advanced technologies in research and industrial issues

PROGRAM EDUCATIONAL OBJECTIVES

PEO – I: Solving civil engineering problems in different circumstances.

PEO – II: Pursue higher education and research for professional development.

PEO – III: Inculcate qualities of leadership for technology innovation and entrepreneurship.

PROGRAM SPECIFIC OUTCOMES

PSO 1 – UNDERSTANDING: Graduates will have ability to describe, analyse and solve problems using mathematical, scientific, and engineering knowledge.

PSO 2 - ANALYTICAL SKILLS: Graduates will have an ability to plan, execute, maintain, manage, and rehabilitate civil engineering systems and processes.

PSO 3 - EXECUTIVE SKILLS: Graduates will have an ability to interact and work effectively in multi disciplinary teams.

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PROGRAMME OUTCOMES

PO 1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO 2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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B.Tech. II Year - I Sem **L/T/P/C**

0/0/2/1

COURCE OUTCOMES

1. Analyze and solve electrical circuits using network laws and theorems.
2. Understand and analyze basic Electric and Magnetic circuits
3. Study the working principles of Electrical Machines
4. Study the working principles of Electrical Machines
5. Introduce components of Low Voltage Electrical Installations
6. Identify and characterize diodes and various types of transistors.

LIST OF EXPERIMENTS

PART A: ELECTRICAL

1. Verification of KVL and KCL
2. i) Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single-Phase Transformer ii) Verification of Relationship between Voltages and Currents (Star-Delta, Delta-Delta, Delta- star, Star-Star) in a Three Phase Transformer
3. Measurement of Active and Reactive Power in a balanced Three-phase circuit
4. Performance Characteristics of a Separately Excited DC Shunt Motor
5. Performance Characteristics of a Three-phase Induction Motor
6. No-Load Characteristics of a Three-phase Alternator

PART B: ELECTRONICS

1. Study and operation of (i) Multi-meters (ii) Function Generator (iii) Regulated Power Supplies (iv) CRO.
2. PN Junction diode characteristics.
3. Zenger diode characteristics and Zanier as voltage Regulator.
4. Input & Output characteristics of Transistor in CB / CE configuration.
5. Full Wave Rectifier with & without filters.
6. Input and Output characteristics of FET in CS configuration

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LIST OF EQUIPMENTS

- KVL and KCL kit
- Transformer 230V/115V
- 1-φ Variac
- Voltmeter (0-300V), Voltmeter(0-600)V-MI, Voltmeter(0-300)V-MC
- 3-φ Variac, 3-φ R-L Load
- Ammeter (0-1/5)A, Ammeter (0-10) A- MI, Ammeter (0-25) A- MC, Ammeter (0-2) A- MC
- DC Shunt motor
- Rheostat 360Ω /1.2 A
- 3-φ Induction Motor, 3-φ Alternator
- 3- φ Variac 440V/0-470V/20A
- Watmeter (UPF) 600V/10A
- Tachometer(Digital)
- RPS (0-30 V)
- CROs (0-20 MHz) dual channel
- Funtion generators (0-1 MHz)
- Multimeters
- Voltmeters(0-50 v), Voltmeters(0-100 v), Ammeters(0-100 μA), Ammeters(0-10 mA), Ammeter (0-1 mA), Ammeter (0-200 μA)
- Bread Boards
- Dacade Resistance Boxes, Dacade capacitance Boxes, Dacade inductance Boxes

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DO's

1. Avoid contact with energized electrical circuits.
2. Disconnect the power source before servicing or repairing electrical equipment.
3. When it is necessary to handle equipment that is plugged in, be sure hands are dry and, when possible, wear nonconductive gloves and shoes with insulated soles.
4. If it is not unsafe to do so, work with only one hand, keeping the other hand at your side or in your pocket, away from all conductive material. This precaution reduces the likelihood of accidents that result in current passing through the chest cavity.
5. If water or a chemical is spilled onto equipment, shut off power at the main switch or circuit breaker and unplug the equipment.

DONT'S

1. Do not make circuit changes or perform any wiring when power is on.
2. Do not wear loose-fitting clothing or jewelry in the lab. Rings and necklaces are usual excellent conductors in contact with your skin.