

KARNATAK LAW SOCIETY'S
GOGTE INSTITUTE OF TECHNOLOGY

UDYAMBAG, BELAGAVI-590008

(An Autonomous Institution under Visvesvaraya Technological University, Belagavi)

(APPROVED BY AICTE, NEW DELHI)



SKILL LABS

FOR

5th Semester Electrical & Electronics Engineering Students

**DEPARTMENT OF
ELECTRICAL & ELECTRONICS ENGINEERING
KLS GOGTE INSTITUTE OF TECHNOLOGY**



**INTRODUCTION TO ELECTRIC VEHICLE
TECHNOLOGY**

FOR

Students of 5th Semester

Overview:

This course covers essential fundamentals of EV design and battery technology. Students will learn about EV architecture, powertrain systems, battery technology, motor design and other aspects of EV technology. The course includes hands-on training to design, simulate and hardware implementation. It is career-focused, preparing students to work in the future automotive industry. This course equips students with the skills to innovate in the evolving electric vehicle sector.

Mode of Conduction of each Module:

Theory:	06 Hours,
Demo:	00 Hours,
Lab Sessions:	03 Hours
Total duration:	09 Hour
Certification exam:	03Hours

Module 1: Introduction to Electric Vehicles & subsystems

Study and demonstration of EV subsystems and key components-electric motor, battery, power electronic converters, types of EV chargers.

Module 2: EV Power train

EV Power train demonstration & working at various test conditions

Module 3: EV Battery System

Study of Battery parameters and connections, Series and parallel connection of cells. Design of Battery Pack using manual spot welding machine

Module 4: Cell testing

Testing of different cells and understanding the characteristics

Coordinators

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Outcomes

Upon completing the electric vehicle design course, participants will be able to:

- Design and analyze the architecture and components of electric vehicles.
- Develop and optimize battery systems tailored for EVs, understanding their chemistry and performance.
- Conduct battery cell testing, characterization, and evaluation for improved efficiency.
- Apply knowledge of EV powertrains, motors, and control mechanisms to simulate and build efficient electric vehicles.
- Pursue careers in electric vehicle design, testing, and innovation in the automotive industry.

Acceptance

In order to accept and start the training program, students are required to register with the respective department. Details to be provided by the student to the department include: **Name, USN, UID, Mobile No, Email id**

Terms and Conditions

- Only students who have paid a skill lab fee to the institution are eligible for the training.
- The students must maintain 90% attendance for obtaining the skill lab certificate.
- Students must attend training as per scheduled time

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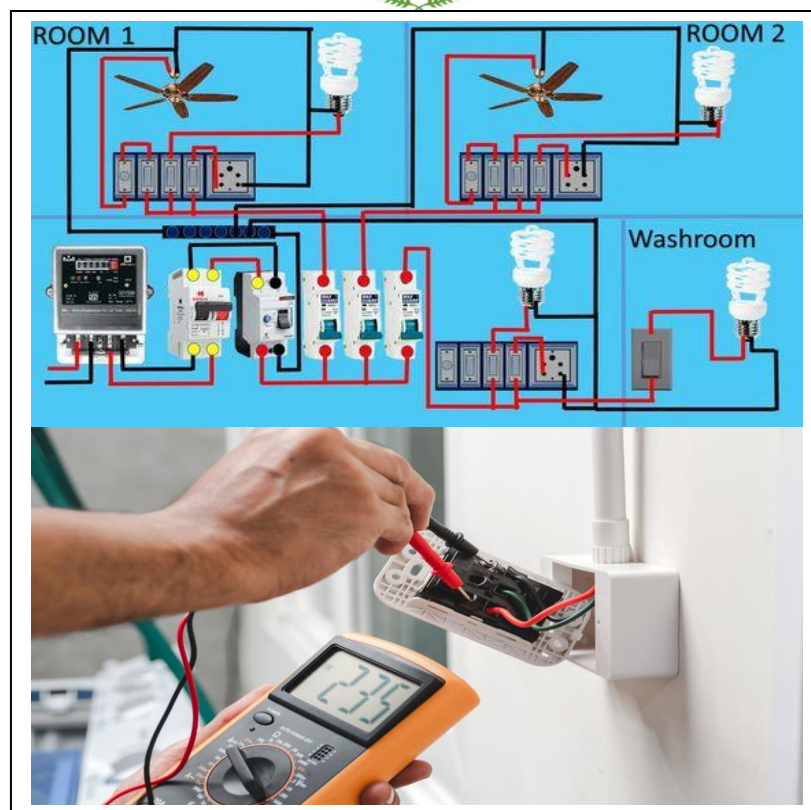
FOR

III Semester Electrical and Electronics Department Students

DEPARTMENT OF

Electrical and Electronics.

KLS GOGTE INSTITUTE OF TECHNOLOGY



Domestic and Industrial Wiring Lab

FOR

Students of III Semester

Overview

The six-day training program provides comprehensive knowledge and hands-on experience in both domestic and industrial wiring systems. It begins with understanding electrical drawings and the tools used for wiring, progressing to wire size calculations, wiring techniques, and switchgear selection. Participants gain practical experience in switchboard wiring, mains connections, and layout planning for homes. The program also introduces essential electrical components such as switches, relays, and circuit breakers, including a visit to an HT yard. Power distribution systems, including three-phase power, transformers, and power factor correction, will be covered. Motor control wiring for single-phase and three-phase motors, along with motor protection systems will be covered.

Mode of Conduction of each Module

Theory: 03 Hours
Demo: 03 Hours
Lab sessions: 03 Hours
Total duration: 06 Hours
Certification exam: Hours

Module 1: Name

- Understanding the Electrical drawing (Wiring Diagram, Symbols etc. E.g. 1BHK Electrical Layout in Auto CAED), Tools used for wiring.
- Wire size calculations with examples, Wire selection, Switchgear Selection approach (Fuse, MCB's etc.), types of wiring (PVC conduit, concealed wiring)

Module 2: Name

- Switch-board wiring (3 pin socket, indicator, Switches) (Hands on), Wiring for 2-BHK house (Plan), Mains connection through Energy meter (From Pole)
- Power Distribution Systems, Transformers, switchgears, and bus bars, Distribution boards and panels, power factor correction devices.

Module 3: Name

- Introduction to Electrical Components and Devices Namely Switches, relays, contactors, Circuit breakers, fuses, Transformers and isolation devices (Visit to HT Yard GIT, Campus), Distribution Boards, Control panels etc.

Module 4: Name

- Motor and Motor Control Wiring for Single-phase and three-phase motors, Starters and contactors, Variable frequency drives (VFD) wiring, Motor protection and control circuits, Wiring for 3-phase motor (Irrigation pump) as a case study.

Coordinators

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Outcomes

1. **Practical Understanding of Wiring Techniques:** Students gain hands-on experience in both domestic and industrial wiring, understanding the intricacies of various circuits, wiring layouts, and safety protocols. This helps bridge the gap between theoretical knowledge and practical application.
2. **Electrical Safety and Risk Management:** By working with real-world wiring scenarios, students learn the importance of electrical safety, protective measures, and how to mitigate risks during installation or maintenance of wiring systems, which is critical in both residential and industrial settings.
3. **Familiarity with Tools and Equipment:** Exposure to tools like wire strippers, pliers, multimeters, and more specialized industrial wiring equipment enables students to become comfortable handling the tools needed for wiring tasks.
4. **Problem-Solving and Troubleshooting:** Students develop skills in diagnosing wiring faults, troubleshooting electrical issues, and identifying potential points of failure in wiring systems, all of which are key skills in the workplace.
5. **Understanding of Electrical Codes and Standards:** The lab can introduce students to the relevant electrical codes and regulations governing wiring in homes and industries, fostering a sense of responsibility for compliance with legal and safety standards.
7. **Skill Development for Employability:** These practical skills are highly sought after in the job market, particularly in industries such as construction, electrical engineering, manufacturing, and facility management. The hands-on experience can give students an edge in job interviews and internships.
8. **Real-World Application of Electrical Engineering Principles:** Students can apply the theoretical concepts they learn in class to real-world scenarios, reinforcing their understanding of topics like current flow, resistance, voltage, and power distribution.
9. **Fostering Innovation and Creativity:** Through practical exposure, students may be encouraged to think creatively about wiring solutions, possibly innovating new ways to improve efficiency or safety in wiring installations.
10. **Confidence in Independent Work:** After completing the skill lab, students often feel more confident in undertaking wiring tasks independently, whether for home repairs, industrial setups, or during professional internships and projects.

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