

**I Year II Semester**

**L T P C**

**Code: 20ES2103**

**0 0 3 1.5**

**ESSENTIAL ELECTRICAL AND ELECTRONICS  
ENGINEERING LABORATORY**

**Preamble** It is an introductory laboratory course which emphasizes the practical investigations on fundamental concepts of electric circuits, dc machines, ac machines and Semi conductor devices.

**Course Objectives:**

1. To analyze a given network by applying basic electrical circuit laws.
2. To calculate, measure and know the relation between basic electrical parameters.
3. To analyze the performance characteristics of DC and AC Rotating machines.
4. To analyze the characteristics of basic semi conductor devices and Op-Amps

**Course Outcomes:**

1. Identify various electrical measuring instruments, equipment and tools and their usage.
2. Analyse, measure, interpret and validate the practical observations by applying the fundamental knowledge of electrical circuits on ac machines, dc machines and electronic devices
3. Design Op-amp based amplifier, voltage summer and integrator circuits for desired specifications.
4. Design circuit for speed control of dc shunt motor and three phase induction motor for desired speed.

**List of Compulsory Experiments**

1. Swinburne's test on a DC Shunt Machine and Predetermination of Efficiency as Generator and Motor
2. Open Circuit and Short Circuit Tests on Single Phase two winding Transformer
3. Brake Test on 3-Phase Induction Motor.
4. Speed Control of DC Shunt Motor by Armature Control Method and Field Control Method
5. Brake test on DC Shunt Motor.
6. Regulation of alternator by synchronous impedance method.

**Additional Experiments:**

1. OC and SC Tests on Single Phase Transformer
2. Brake Test on DC Shunt Motor
3. Input and output characteristics of CE configuration.
4. Design of voltage summer and integrator using op-amp.
5. Soldering practice.

**Reference Books:**

1. P. S. Dhogal, Basic Practicals in Electrical Engineering, Standard Publishers, 2004.
2. Yannis Tsividis, A First Lab in Circuits and Electronics, Wiley, 1st edition, 2001.