

Course code	Course Name:	L-T-P-Credits	Year of Introduction
EE339	ELECTRICAL ENGINEERING LAB	0-0-3-1	2016

Prerequisite : EE214 Electrical technology and instrumentation

Course Objectives:

- Introduction to devices commonly used in carrying out experiments pertaining to the domain of electrical engineering.
- Familiarization in setting up of experiments in a laboratory environment.
- To carryout load test on various electrical machinery and evaluate their performance.
- Provide an environment to correlate theoretical knowledge gained in the class room with the physical world.

List of Exercises/ Experiments (Minimum 12 experiments/exercises are mandatory)

1. Study of 3-point and 4-point starters for D.C machines
Equipment: 3 Point Starter, 4 Point Starter.
2. OCC of self excited D.C machines – critical resistances of various speeds. Voltage built-up with a given field circuit resistance. Critical speed for a given field circuit resistance.
Equipment: D.C Motor-Generator set, Ammeter, Voltmeter, Rheostat.
3. OCC of separately excited D.C machines.
Equipment: D.C Motor-Generator Set, Ammeter, Voltmeter, Rheostat.
4. Load test on shunt generator – deduce external, internal and armature characteristics.
Equipment: D.C Shunt Generator- Motor Set, Ammeter, Voltmeter, Rheostat, Loading Rheostat.
5. Load test on compound generator.
Equipment: Compound Generator, Ammeter, Voltmeter, Rheostat, Loading Rheostat.
6. Swinburne's test on D.C machines.
Equipment: D.C Shunt Motor, Ammeter, Voltmeter, Rheostat.
7. Brake test on D.C shunt motors and determination of characteristics.
Equipment: D.C Shunt Motor, Ammeter, Voltmeter, Rheostat.
8. Brake test on D.C series motors and determination of characteristics.
Equipment: D.C Series Motor, Ammeter, Voltmeter.
9. Brake test on D.C compound motors and determination of characteristics.
Equipment: D.C Compound Motor, Ammeter, Voltmeter, Rheostat.
10. O.C and S.C tests on single phase transformers – calculation of performance using

equivalent circuit – efficiency, regulation at unity, lagging and leading power factors.

Equipment: Single Phase Transformer, Ammeter, Voltmeter, Wattmeter, Autotransformer.

11. Load test on single phase transformers.

Equipment: Single Phase Transformer Ammeter, Voltmeter, Wattmeter, Loading Rheostat

12. Alternator regulation by emf and mmf methods.

Equipment: Alternator Set, Ammeter, Voltmeter, Rheostat.

13. Study of starters for three phase induction motors.

Equipment: Star Delta Starter, TPDT switch, Autotransformer.

14. Load tests on three phase squirrel cage induction motors.

Equipment: 3 Phase Squirrel Cage Induction Motor, Ammeter, Voltmeter, Wattmeter.

15. Load tests on three phase slip ring induction motors.

Equipment: 3 Phase Slip Ring Induction Motor, Ammeter, Voltmeter, Wattmeter.

16. Load tests on single phase induction motors.

Equipment: Single Phase Induction Motor, Ammeter, Voltmeter, Wattmeter.

17. Polarity, transformation ratio of single phase transformer.

Equipment: Single Phase Transformer, Ammeter, Voltmeter.

18. Equivalent circuit of three phase squirrel cage induction motor.

Equipment: 3 Phase Squirrel Cage Induction Motor, Ammeter, Voltmeter, Wattmeter.

Course Outcome:

Upon successful completion of the course, the student will be:

- i. Familiar with the arrangement and conduct of experiments in an electrical laboratory environment.
- ii. Able to note down relevant readings and perform calculations while an electrical experiment is in progress.
- iii. Able to comprehend the factors responsible for variation between theoretical and experimental results.

Text Book:

- J. B. Gupta; Theory and Performance of Electrical Machines; S.K. Kataria & Sons.