# Techno College of Engineering Agartala

An Engineering College Approved by AICTE, MHRD, Govt. of India
Affiliated to Tripura University (A Central University),
**Department of Electrical Engineering**

## List of Laboratory Experiments

| Power System Laboratory | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Course Code** | **Hours / Week** | | | | **Maximum Marks** | | |
| PC EE 607 | L | T | P | C | **CIA** | **SEE** | **Total** |
| | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| **Number of classes: 24 hours** | | | **Prerequisites:** Power System; Electrical machine | | | | |
| **Branch: EE** | | | **Semester: VI** | | | | |

**Course overview:**

The Power System Laboratory offers hands-on experience in analyzing and testing key components of electrical power systems. Students conduct experiments on transmission line performance, including no-load tests, Ferranti effect, ABCD parameter determination, and load regulation. Fault analysis for both symmetrical and unsymmetrical conditions is performed and compared with theoretical results. The course also includes practical studies of DC distribution networks and protection systems, such as Buchholz relays, differential relays, and numerical motor protection relays. Students also learn to test and plot characteristics of over-voltage and under-voltage relays, enhancing their understanding of real-world power system operation and protection.

**Course objectives:**

1. To understand and analyze the performance of electrical transmission lines through experimental methods.
2. To study and verify the behavior of power systems under fault conditions.
3. To explore different types of DC distribution systems and their configurations.
4. To gain practical knowledge of power system protection devices and relay testing.

**Course outcomes:**

| CO Number | CO Description | K-level |
|---|---|---|
| CO-1 | Determine the constants of Transmission lines | K-5 |
| CO-2 | Identify different types of Distribution networks | K-3 |
| CO-3 | Analyse the characteristics of different types of relays. | K-4 |

| | | |
|---|---|---|
| CO-4 | Understand different types of protection scheme of power network. | K-2 |
| **Sl. No.** | **EXPERIMENT NAME** | **CO** |
| 1. | No load test &Ferranti effect of electrical transmission lines. | CO1 |
| 2. | Determination of transmission line constants (ABCD) by experimental measurement using 2-port method as well as by knowing components values and its verification. | CO1 |
| 3. | Load Test & Calculation of Regulation, efficiency of Transmission Line | CO1 |
| 4. | Verification of practical results with theoretical calculations for symmetrical faults of transmission lines. | CO1 |
| 5. | Verification of practical results with theoretical calculations for unsymmetrical faults of transmission lines | CO1 |
| 6. | Study the various type of dc distribution network system like · Distribution system fed at one end · Distribution system fed at both end · Distribution system fed at centre · Ring Main distribution system | CO2 |
| 7. | Study the working principle of Bucholtz relay by Experiments. | CO3 |
| 8. | Study of the working principle percentage biased single phase differential relay by Experiments. | CO3 |
| 9. | Study (Practical) the three phase AC Motor protection using numerical type power systems relay consisting<br>· Testing of motor protection relay with Over-Current Fault · Testing of motor protection relay with Motor Earth- Fault · Testing of motor protection relay with Motor Rotor Locked Fault · Testing of motor protection relay with Motor Un-Balanced Voltage Fault · Testing of motor protection relay with Under Current Fault · Testing of motor protection relay with Thermal Fault Protection | CO4 |
| 10. | Study and testing of over voltage relay with different voltage & time setting multiplier. · Measurement of relay tripping time. · Plotting the IDMT characteristics of over voltage relay. | CO4 |
| 11. | Study and testing of under voltage relay with different voltage setting multiplier. · Measurement of relay tripping time · Plotting the IDMT Characteristics of Under voltage relay. | CO4 |