**CERTIFICATE COURSE IN PRACTICAL ELECTRONICS (CCPAE)**

Course Code: **MMCPHY/CCPAE 21-22**

Course Duration: 30 Hours

Course Co-ordinator: Dr. Sijo A. K.

Course Fee: Rs 100/- NIL

***Requirements: Any third-year degree student other than Physics mainstream can apply***

Candidates may contact the Department of Physics for more details. The application form can be downloaded from the college website <https://marymathacollege.ac.in/department/physics>

**Aim:** CCPAE is indented for developing your understanding of the basics of electronics. It will provide you with a solid understanding of the basic concepts of the basics of electricity and will give hands-on training on circuit-building activities. This course note provides practical knowledge of analogue electronics.

**LEARNING OBJECTIVES**

Upon completion of this course, the participant should be able to:

* Explain how to find resister values with a meter and colour code.
* Use Ohm’s law to find unknown values.
* Clear different modes of failure: open circuits, short circuits, and ground faults.
* Calculate voltage, wattage, resistance, current and power factor values.
* Select appropriate test equipment for taking voltage measurements.
* Interpret multi-meter readings to measure voltage, amperage, diodes, continuity, resistance, etc…
* Explain the basic concepts of AC and DC electrical current flow.
* Identify electrical symbols and measuring instruments.
* Voltage Step up & Step down transformer
* Rectifier -Half wave & Full wave rectifiers
* Filter Circuits

**COURSE CONTENT Duration: 30 hours**

1. **Electrical Fundamentals (Theory):** ( 14 hours)

Ohms law voltage, current and resistance, resistors, capacitors, colour code, Faraday’s law of electromagnetic induction, voltage step-up and step-down process, diodes, AC-DC conversion- Rectifiers, Filter circuits.

1. **Practical (Hands-on circuit building activities):**(16 Hours)
2. Use multi-meter readings to measure voltage, current, continuity, resistance, etc…
3. Hands-on circuit (parallel and series circuits) building activities (soldering) with resistors, capacitors, diodes and LEDs.
4. Electro-Magnetic induction Experiment
5. AC to DC conversion-Construction of rectifiers- Half wave & full wave rectifiers
6. Voltage step up, voltage step down and stabilization
7. Clearing different modes of failure: open circuits, short circuits, and ground faults.
8. Single-stage amplifier circuits
9. Voltage multiplier