



**Darrang College
(Autonomous),
Tezpur-784001**

Syllabus for Certificate Course

**Course Name: Basic Electronics with bulb
Assembling / Manufacturing**

Certificate Course on Basic Electronics with LED bulb Assembling / Manufacturing

Course Duration: 36 hrs /3 months (12 weeks) :: **Eligibility:** 10+2 passed

Syllabus

Course objective and out come :

The Basic Electronics certificate program is designed to provide instruction covering the fundamental information required for understanding the theory of AC and DC electricity and electronics, including sources of electricity, basic circuits and components, and their application to practical devices. Students will learn how to work with various electronic devices. They will also learn about important electrical concepts used in consumer electronic devices and get a serious grounding in electronics theories that are absolutely essential for workplace safety and success.

Course Contents :

Module – I :

Lectures : 10

Introduction to Electricity and Electronics - Fundamental concepts of potential difference, electric currents (AC and DC), resistance and Ohm's laws.

Basic electrical and electronic components and devices, viz., resistors, capacitors, inductors, cells and batteries, diodes, Zener diodes, transistors, transformers, motors, integrated circuits (IC), rectifiers, power supply, relays, etc. and their usages and application in various electrical and electronic devices.

Module – II :

Lectures : 10

Semiconductors : Review of basic atomic structure and energy levels, concept of insulators, conductors and semi conductors, atomic structure of Germanium (Ge) and Silicon (Si), covalent bonds. Concept of intrinsic and extrinsic semi conductor. Energy level diagram of conductors, insulators and semi conductors; minority and majority charge carriers. types of semiconductors –P and N type semiconductors., PN junction diode, mechanism of current flow in PN junction, forward and reverse biased PN junction, potential barrier. Zener diode. Rectifiers – Half-wave and full-wave rectifiers, Bridge rectifier. Efficiency calculations of Half-wave and full-wave rectifiers.

Module – III :

Lectures : 16

Transistors : Configuration of transistors – CB, CE, CC configurations of a transistor; Input and output characteristics in CB and CE configurations; input and output dynamic resistance in CB and CE configurations; current amplification factors. Comparison of CB, CE and CC configurations. Application of Transistors as amplifier in CE Configuration. FETs and MOSFETs. Printed circuit board (PCB). Introduction to Logic gates – Basic gates : AND, OR, NOT, XOR, NAND, etc. Boolean Algebra, truth table of logic gates. Introduction to Integrated Circuits (IC) and their manufacturing. IC memory devices.

List of Practicals :

1. Identification of Electronic components.
2. Familiarization with operation and use of CRO/DSO, Signal generator, LCR meter, Regulated Power Supply.
3. Use of multi-meter – Measurement of DC and AC voltages.
4. Checking of components, measurement of values of various components, Checking of faults in circuits etc. using multi-meter.
5. Plotting of V-I characteristics of a PN junction diode.
6. Plotting of V-I characteristics of a Zener diode.
7. Construction of half-wave, full wave and bridge rectifiers with filters.
8. Construction of a basic amplifier circuit using transistors.
9. Fabrication of simple PCB power supply.
10. LED bulb Assembling.

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