



OVERVIEW: Hands-On-Training on the Basics of Electronics

Objectives of the course

- ✓ To get familiar with commonly used active and passive electronic components
- ✓ To learn the basic building blocks commonly used in making projects
- ✓ To learn software simulation tools used for circuit design and analysis
- ✓ To learn soldering and the use of test equipment in fault finding
- ✓ To construct a simple project

Familiarization with electronic components

- a) Resistors – functions, characteristics and types
- b) Capacitors -- functions, characteristics and types
- c) Inductors and transformers
- d) Relays, switches, cables and connectors
- e) Diodes, zener diodes and LEDs
- f) Transistors as switching devices
- g) Operational amplifiers
- h) 555 timers
- i) Basic logic gates and combinational circuits

Circuit simulation and analysis using QUCS Simulator

- a) DC analysis (steady state) of simple circuits, and verifying basic laws of electrical circuits
- b) Transient behaviour of circuits containing energy storing elements like inductors and capacitors
- c) Simulation of diode and transistor characteristics
- d) Design and simulation of half wave, full wave and bridge rectifiers with filters
- e) Opamp's operation as inverting, non-inverting amplifier
- f) Opamp's application -- differential amplifier, summing amplifier, comparator, integrator, differentiator, square wave generator

Basic building blocks

- a) Rectifier circuit with filter and regulator
- b) Switching circuit using transistor
- c) Inverting, and non-inverting amplifier circuits using $\mu A741$ op-amp
- d) Astable and monostable circuits with 555 timer

Electronics workshop practice

- a) Essential components of an Electronic Tool Kit that the hobbyist should have
- b) Use of digital multimeter
- c) Soldering techniques -- fixing of components on a PCB, and soldering them

Project work

- a) Burglar alarm
- b) Timer for students

Note:

1. Course fee is Rs 4000 + 10.3% service tax = Rs 4,412 (including registration, training, reference CD and take away project)
2. Timings for week days are 10:30 AM to 5:30 PM
3. Timings for weekend classes are:
Saturday 1.30 PM - 5:30 PM; Sunday 10 PM - 5 PM
4. Students will receive certificates from EFY on successful completion of the course.
5. A CD, which contains the course content, the reference manual, data manual and related software, will be provided at the end of the course