

# ADVANCE COURSE IN ELECTRONICS

## COURSE DETAILS

### BASIC ELECTRONICS

#### THEORY

- Resistors, Capacitors, Inductors
- Diodes, Transistors
- Thyristor, SCR
- TRIAC, JFET, MOSFET
- Wires & Cables
- Switches, Relays
- Microphone & Speakers
- Crystals
- Voltage Regulators, Line Filters
- LCD, 7-Segment Displays
- Bread-board, ICs (Digital, Analog,  $\mu\text{P}/\mu\text{C}$  etc.)
- Soldering Components etc.

#### Projects Work

- Fixed DC Power Supply
- Positive DC Power Supply
- Negative DC Power Supply
- Variable DC Power supply
- Transistor as switch (NPN & PNP)
- Transistor Application as Relay Driver (Darlington Pair)
- Transistor Application as Voltage Level-Shifter
- Dark/Light Activated Relay Operation
- DC Motor driving.

#### Do you know???

What is difference b/w BC547, BC557, CL100?  
CK100, TIP31C?

Very Valuable unit of any project is regulated power supply. Are you able to design that on your own?

There are five types of resistance and 7 types of diodes.

And there are many more .....

### DIGITAL ELECTRONICS

#### THEORY

- TTL, CMOS
- Logic gates
- Mix, Demux
- Decoder, Encoder

- Flip/Flops
- Shift Register
- Counter, Timer
- Buffers, Drivers

### **PROJECT WORK**

- Verification of Truth table of Digital Gates (NAND, X-OR etc.)
- Flip-Flops(R-S, J-K etc.)
- 555 Timers
- Astable Mode
- Bistable Mode
- Monostable Mode
- Counters (Binary/Decade)
- Display Drivers/Decoders
- Multiplexers (MUX)
- Demultiplexers (DEMUX)

### **Do you know???**

Have u realized that CMOS IC works for the range of 3-18 V but not TTL?

Have u seen output waveforms of 555 IC in all basic modes of operation (Astable, Bistable, monostable)?

There is only one IC that can be used for counter (BINARY/DECADE) and display driver/ decoder application.

And there are many more .....

## **ANALOG ELECTRONICS**

### **THEORY**

- Op amps
- Instrumentation Amplifier
- AC Amplifier
- V-I/I-V Converter
- Sample & Hold Circuit
- Log & Antilog Amplifiers
- Multiplier & Divider
- Differentiator
- Integrator
- Comparator
- D/A, A/D etc.

### **PROJECT WORK**

- Amplifier
- Summing Amplifier
- Subtracting Amplifier
- Comparator Usage
- A to D converter
- Temperature indicator using A/D Converter & Temp Sensor.

### **Do you know???**

What is analog ground, digital ground and virtual ground in analog electronics circuits & how they differ?

Same voltage is being measured at inverting and non-inverting input terminal of an op amp irrespective of voltage applied?

How actually is voltage amplified by an op amp? Why there is need of offset control pins in all Op amp?

And there are many more questions that can be solved within training program.

NOTE: All the project work will be done by hand soldering on a general purpose board.

### **Measuring instruments and debugging tools**

Ammeter

Voltmeter

Multi meter

CRO

Storage CRO

Spectrum Analyzer

**An Investment in Knowledge Pays Best Returns. Benjamin Franklin**

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