

## Report on Certificate Course on PCB Design and Fabrication

The Electronics and Communication Engineering department has conducted a **certificate course on "PCB Design and Fabrication"** from 20<sup>th</sup> Feb 2019 to 23<sup>rd</sup> Feb 2019 in association with Technotran Electronic Solutions, Nellore. The resource persons were **Mr.R.Vikas, Director, Mr.G.Rudra Kumar, Technical Associate Engineer, Mr.T.Avinash, Technical Associate Engineer & Mrs.K.Varalakshmi, Senior Technical Associate Engineer** from Technotran, Nellore.

### Objective of the certificate course:

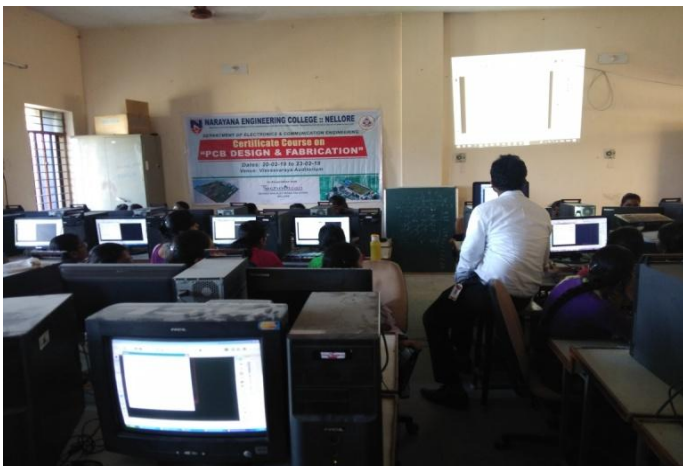
The aim of this certificate course is to provide Knowledge on Electronic components, Schematic drawing design, circuit simulation and PCB Design techniques



*Photos: Inauguration Session.*



*Photos: Hand-on Session*



## Day Wise Schedule:

### Day: 01 (20.02.2019)

- Introduction to PCB, Types of PCBs
- Advantages of PCB Design & Fabrication
- Methods of manufacturing PCB
- Toner Transfer Method
- Introduction to Etching Process
- PCB Designing - Career Prospects
- Introduction to KICAD
- Steps in KICAD-Eeschema , Schematic Design
- Annotation, Electric Rule Check
- Net List Generation, BOM Generation
- Cvp pcb- Changing Components to Module

### Day: 02 (21.02.2019)

- Footprint Description
- Selecting and Assigning Footprints
- PCB new-PCB Editing and Routing
- Designing the tracks, PCB Edges
- 3D View of Gerber File Generation
- Component Creation
- Adding components to Library, Footprint Creation

### Day: 03 (22.02.2019)

- Etching Process
- Drilling process and Drilling Techniques
- Soldering Techniques

### Day: 04 (23.02.2019)

- Soldering process
- Other manufacturing processes & Industrial Manufacturing Videos
- Circuit Explanation
- Testing the Board

\*\*\*\*\* REVIEW AND Q&A SESSION \*\*\*\*\*

### About Printed Circuit Board (PCB):

A Printed Circuit Board, or PCB, is used to mechanically support and electrically connect electronic components using conductive pathways, tracks or signal traces, etched from copper sheets, laminated onto a non-conductive substrate. Today printed

circuit boards are used in virtually all of the commercially produced electronic devices, and they can be manufactured using fully automated assembly processes, which were not possible or practical in earlier generations' tag type circuit assembly processes. Consumers are driving industry growth with a desire for cool and compact products and great technology alone is no longer enough to differentiate between such products. It must be squeezed into a "cool" package in order to sell and this has an effect on everything inside the box - including the PCB, the chip and what's packaged on the chip.

### **Certificate course on PCB Design & Fabrication:**

Students end up spending up to 50% of their project development time and money due to improper electronic component selection using trial & error method for their minor & major projects.

This Course is dedicated in training the students on the design and manufacturing of a Printed Circuit Board. This course is an invaluable resource for those who are learning PCB design. Designing a PCB is not something you will do in a couple of hours. It is a highly technical skill and it might take months or years to master it. This Course will provide an insight into the basics of PCB design, as well as some knowledge about more advanced topics.

This is a 4-day program which focuses on advanced topics of PCB design along with Fabrication Process.

**First day:** The resource person will give the overview of PCB. This includes introduction to PCB, Types of PCB, Advantages of PCB Design & Fabrication, Methods of manufacturing PCB, Toner Transfer Method, Etching Process, Introduction to KICAD, Steps in KICAD-Eeschema, Schematic Design etc. In first day totally concentrated on only theory part.

*Photos: 1<sup>st</sup> day Theory Session*







In software session students were designed different applications like ***Blinking LED, Buzzer, Fire detector, Water level Indication*** etc. Students felt very happy by seeing the output.

**Second day:** Each participant will design a PCB layout using KI-CAD software for different circuits.

**Third Day:** In this third day, students learned about etching process, drilling process & drilling techniques and also soldering techniques. Students carried out etching process on a laminated copper sheet provided to them. They also performed Drilling process using a hand driller, finally they made assembled and soldered the electrical components onto the board.

**Fourth Day:** Fourth day students designed & tested PCB boards for different circuits.

*Photos: Hands-on, Group Photos*



### **Kit Contents:**

- ✚ Laminated Copper Cladding Board
- ✚ Components Packet, Chemical Etchant( $\text{FeCl}_3$ )
- ✚ Hand Driller ,Soldering Iron, Lead & Flux

### **Benefits of attending Certificate Course:**

- ✚ Learn & Interact with renowned Industry Experts.

- ✚ Receive an unparalleled education on the art of PCB designing with personal one-on-one attention.
- ✚ Covers all the basics of PCBs.
- ✚ Softcopy developed by well-established Industry experts (through E-mail).
- ✚ Hands-On Experience of Latest PCB Techniques & Tools. All the necessary software & Hardware would be provided for the workshop purpose.
- ✚ **1 Take Away PCB board done by them.**
- ✚ All participants will be given a '**Certificate of Participation**'.

**Course outcomes:**

- ✚ Receive an unparalleled education on the art of PCB designing with personal one-on-one attention.
- ✚ The circuit designing in the KiCad software and can design their own circuits.
- ✚ Design Schematic of the circuit In EeSchema
- ✚ Selection of Foot Prints for the Components in CVPCB
- ✚ Plotting Gerber files
- ✚ Hands on experience in PCB Fabrication
  - ❖ Toner transfer method
  - ❖ Etching Process
  - ❖ Drilling and Placement of Components
  - ❖ Soldering And testing of the Circuit

**The total of 85 students from II year attended for this course.**

The content covered during these four days includes basic knowledge on electronic components, Schematic drawing, circuit simulation and hands – on experience in PCB layout design.

\*\*\*\*\*&&&&&&&\*\*\*\*\*  
\*\*\*\*\*

*Head dept. of ECE*