



NARAYANA ENGINEERING COLLEGE::NELLORE

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ISO 9001:2015 certified Institution, Approved with 'A+' Grade by NAAC



DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

A REPORT ON "PCB DESIGN & FABRICATION"

1	Name of the Activity/Event	Certificate course on "PCB Design and Fabrication"		
2	Date of Activity/Event	19 th August 2019 to 23 rd August 2019		
3	Organized by	Department of <i>Electronics And Communication Engineering</i>		
4	Place of Activity/event	Visvesvaraya auditorium		
5	Resource persons / guest / organization	Mr.Rakesh Rajan, TAKEOFF GROUP, Tirupati.		
6	Type of activity/Event	Certificate course		
7	Activity/Event objectives	1. To give basic knowledge on Electronic components. 2. Schematic drawing and circuit simulation.		
8	Participation	Students	Faculty	Total Participation
		112	0	112
9	General remarks	<ul style="list-style-type: none">Hands-on experience was very good.The entire session was conducted smoothly.		
10	Suggested Improvements	Insufficient computers in lab for software session.		
11	Enclosures	1. Program report with Snapshots 2. Participants List 3. Attendance sheet 4. Certificates		
12	Signature of In charge / convener	Mr.J.Sunil Kumar, Assoc. Prof, Dept of ECE		

The Electronics and Communication Engineering department has organized a five day certificate course on "PCB Design and Fabrication" from 19th August 2019 to 23rd August 2019 in association with TAKEOFF GROUP, Tirupati under IETE banner.. The resource person was Mr.Rakesh Rajan from TAKEOFF GROUP, Tirupati.

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



Day Wise Schedule:

Day: 01 (19.08.2019)

➤ 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 Proteus
➤ Steps in Proteus - Schematic Design
➤ Annotation, Electric Rule Check
➤ Net List Generation, BOM Generation
➤ CVPCB - Changing Components to Module

Day: 02 (20.08.2019)

➤ 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 (21.08.2019)

➤ Etching Process
➤ Drilling process and Drilling Techniques
➤ Soldering Techniques

Day: 04 (22.08.2019)

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

<u>Day: 05 (23.08.2019)</u>
Making a Mini-Projects
***** REVIEW AND Q&A SESSION *****
Certificate Distribution

About Printed Circuit Board (PCB):

Printed Circuit Boards (PCB) are thin plates which are usually made of fiberglass, laminated materials, or composite epoxy used as physical base to support chips and electronic components. These boards are printed or etched with conductive pathways to form circuits that will power electronic devices or gadgets. They support different electronic components like integrated circuits, resistors, and transistors, which are interconnected in the copper tracks. These components are put by drilling holes in the board and soldering them into the circuit pattern. Today's products are extremely complex. In order to meet market demand for competitively differentiating features, many modern products have evolved into an integrated system of mechanical components, electronics, and software. Managing this system is complex in itself, but it also adds even more complexity to each aspects of the design. The result: more is needed from the PCB. The result is that designing the PCB has become extremely challenging, which sets the designers need more for this industries.

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 5-day program which focuses on advanced topics of PCB design along with Fabrication Process.

Certificate Course Objective:

- Introduction of PCB.
- Advantages of PCB.
- Basic electronics
- Proteus software tool explanation.
- Schematics Creation.
- Reference component names / Adding Reference Texts silk screen prints on PCB.
- Layout preparation of PCB.
- Making print on copper board, Etching process.
- Soldering and testing components on board.

Topics to be covered during Course:

- Introduction of PCB.
- Advantages of PCB.
- Basic electronics
- Proteus software tool explanation, Schematics Creation.
- Reference component names / Adding Reference Texts silk screen prints on PCB.
- Layout preparation of PCB.
- Making print on copper board.
- Etching process.
- Soldering and testing components on board.

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 Proteus, Steps in Proteus - Eeschema, Schematic Design etc. In first day totally concentrated on only theory part.

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 Proteus 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 & Fifth Day: These two days students designed & tested PCB boards for different circuits like Blinking LED, Buzzer, Fire detector, Water level Indication.



Photos: Hands on Session in both Software & Hardware

Kit Contents:

- Copper coated Board
- PCB stickers, Soldering rods
- Ferric chloride solution
- IR sensor module, DC motor
- Transformer
- Stripper & Connecting wires

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 Certificate Course purpose.
- + **Batch members can 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 Proteus 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 112 students from II year attended for this course.

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

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