



JSPM's BHIVRABAI SAWANT INSTITUTE
OF TECHNOLOGY AND RESEARCH
Wagholi, Pune.



Department of Electronics & Telecommunication Engineering

A Report On

“Printed Circuit Board Workshop”
Under Electronics and Telecommunication Students Association

Name of The Programme	“Two Day workshop on PCB Design” (Under the Electronics & Telecommunication Students Association)
Objective	The aim of this workshop is to implement electronic hardware by learning PCB artwork design, soldering, testing etc.
Date of Conduction	10/03/2023 and 11/03/2023
Programme Convenor	Dr. Y. S. Angal, HOD (E&TC)
Coordinator	Assit. prof. Poonam V. Gawade
Students Participated	76 students of TE (E&TC) class

On First day, explained introduction of PCB, Types of PCB as well as software Proteus used for design of PCB layout. On Second day, explained PCB fabrication Method and introduced all fabrication hardware and procedure. For PCB fabrication used Driller machine, UV Light exposure for printing negative image of layout, coater and drier machine and etcher.

Day 1: Date 10/03/2023

Introduction:

PCB is a copper laminated and non-conductive **Printed Circuit Board**, in which all electrical and electronic components are connected together in one common board with physical support for all components with base of board. When PCB is not developed, at that time all components are connected with a wire which increases complexity and decreases reliability of the circuit, by this way we cannot make a very large circuit like motherboard. In PCB, all components are connected without wires; **all components are connected internally**, so it will reduce the complexity of the overall circuit design. PCB is used to provide electricity and connectivity between the components, by which it functions the way it was designed. PCBs can be customised for any specifications to user requirements. It can be

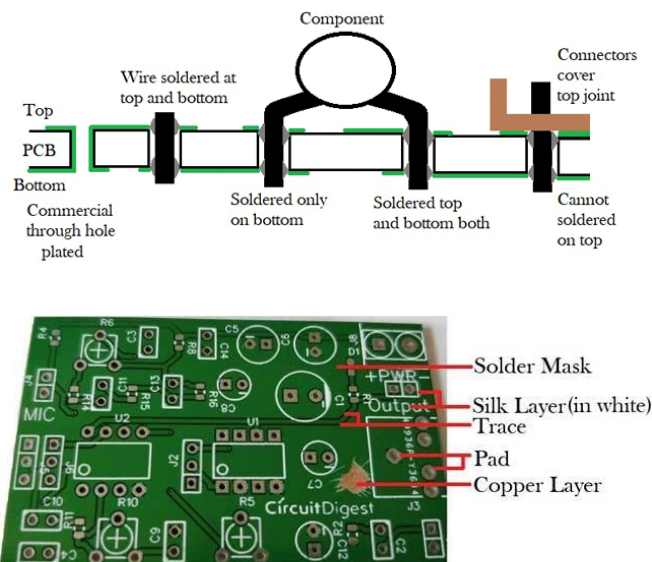
found in many electronics devices like; TV, Mobile, Digital camera, Computers parts like; Graphic cards, Motherboard, etc. It also used in many fields like; medical devices, industrial machinery, automotive industries, lighting, etc.

Types of PCB:

There are several types of PCB available for the circuit. Out of these types of PCB, we have to choose the appropriate type of PCB according to our application.

1. Single-layer PCB
2. Double-layer PCB
3. Multi-layer PCB
4. Flexible PCB
5. Aluminium backed PCB
6. Flex-rigid PCB

Different Parts of PCB:



Pad: Pad is nothing but a piece of copper on which lead of components are mounted and on which soldering are done. Pad provides the mechanical support to the components.

Trace: In PCB, components are not connected with the help of wires. All components are connected with a conducting material like copper. This copper part of PCB which is used to connect all components that is known as trace. Trace is looks like below figure.

Layers: According to application, cost and available space of circuit, user can choose the layer of PCB. Most simple in construction, easy to design and most useful in routine life is single layer PCB. But for very large and complex circuit, double layer PCB or Multi-layer PCB is most preferred compared to single layer PCB. Now a day, in multi-layer PCB, 10-12 layers can be connected and most critical thing is to communicate between the components in different layer.

Silk layer: Silk layer is used for printing line, text or any art on the surface of PCB. Usually, for screen printing epoxy ink is used. Silk layer can be used in top and/or bottom layer of PCB according to user requirement which is known as silk screen TOP and silk screen BOTTOM.

Top and bottom layer: In Top layer of PCB, all components are mounted in this layer of PCB. Generally, this layer is green coloured. In bottom layer of PCB, all components are soldered through the hole and lead of components is known as bottom layer of PCB. Sometime, in top and/or bottom layer PCB is coated with green colour layer, which is known as solder mask.

Solder Mask: There is one additional layer on the top of copper layer called as Solder Mask. This layer generally has green color but it can be of any color. This insulating layer is used for to prevent accidental contact of pads with other conductive material on PCB.

PCB Layout design Software:

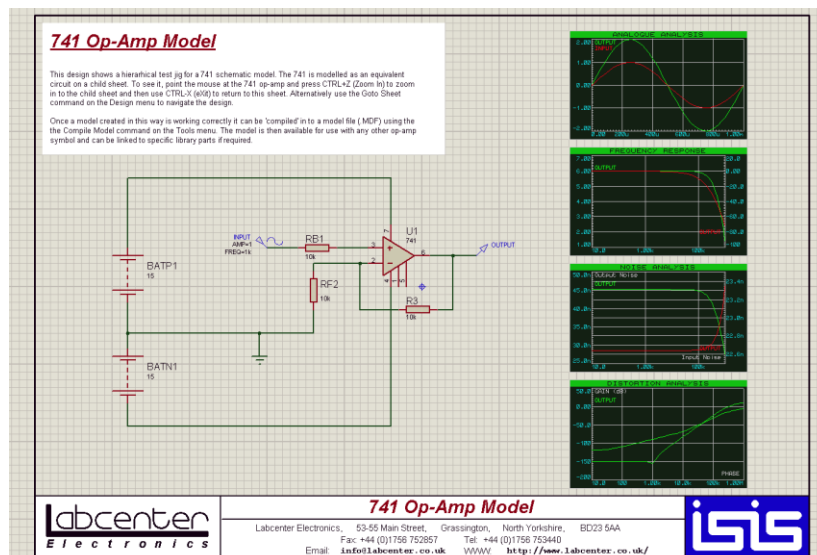
Proteus:

The Proteus electronic CAD solution, was developed by Lab center Electronics Ltd., a company founded by John Jameson in 1988 in the United Kingdom. Wide spreaded, Proteus is marketed in over 50 countries

Features and specifications

This suite has two main software programmes:

- Proteus ISI: diagram creation and electric simulation
- Proteus ARES: printed circuit routing solution with automatic component positioning



Day 2: Date 11/03/2023

Actual PCB fabrication procedure done by using hardware tools like PCB cutter, PCB coater and dryer, UV Exposure, Etcher and Driller.

Some glimpses of students participations:



PCB Cutting



PCB layout UV Exposure



Applying Photo resist and drying PCB



PCB Drilling


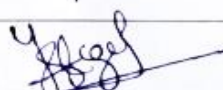



Soldering/component mounting

Outcomes:

By attending the workshop, the students can be able to perform different projects under mini project as well as Major projects, as part of the curriculum. Further, the students will gain knowledge on hardware design related issues.

Sr. No.	Workshop Outcome	PO	PSO
1	Understand the steps involved in schematic, layout, fabrication and assembly process of PCB design	PO1, PO2, PO3, PO4, PO10	PSO1, PSO2
2	Design (schematic and layout) and fabricate PCB for simple circuits.	PO1, PO2, PO3, PO4, PO5, PO10	PSO3

Programme Co-Ordinator	Asst. Prof. P. V. Gawade (E&TC) BSIOTR	
Programme Convenor	Dr. Y. S. Angal, HOD (E&TC), BSIOTR	
Principal	Dr. T. K. Nagaraj, Principal, BSIOTR	 PRINCIPAL

Bhivarabai Sawant Institute Of Technology & Research
Wagholi, Pune-412207.