National Workshop on PCB Design and Fabrication (PDF 2K19)
19, 20 and 21 September 2019

1. **Title of the activity:** National Workshop on PCB Design and Fabrication (PDF 2K19)
2. **Activity Detail**
    a. **Objective:**

The objective of the workshop included:

- Understanding of the steps and processes involved in PCB design process
- PCB fabrication process
- Schematic capturing using industry standard schematic capturing tools
- Preparation of board for layout
- Practical hands on to demonstrate PCB fabrication of a circuit

b. Program detail:

A three days National workshop on "PCB Design and Fabrication (PDF2K19)" was organized by Department of Electronics and Communication Engineering, Swami Keshvanand Institute of Technology, Management and Gramothan, Jaipur, on 19, 20 and 21 September 2019. Mr. Pallav Rawal, Assistant Professor, ECE and Mr. Ankit Agarwal, Assistant Professor, ECE were the coordinators of workshop. Tutorial lecturers based on PCB design and fabrication was scheduled on the first day of the workshop. The tutorials have already started on September 19, 2019. Prof. (Dr.) S. K. Bhatnagar delivered a lecture on "PCB Design Considerations, Design Rules and Fabrication Process", in first session of the day one. In this Tutorial Prof. S. K Bhatnagar explained to the students about various steps used in PCB Fabrication and the critical parameters associated with Fabrication rules. After this lecture, there was a Hands-on practical session on "PCB Circuit and Layout Design with the help of software". It was educated by Mr. Pallav Rawal and Mr. Ankit Agarwal. After that, participants were divided into three groups. Three lab sessions were organized in parallel.

- PCB fabrication, taken by Mr. Pallav Rawal.
- Circuit designing and Simulation on Proteus, taken by Mr. Ankit Agarwal and Ms. Priyanka Sharma
- Visual inspection and PCB Pre and Post processing tools, taken by Ms. Pooja Choudhary, Ms. Kiran Rathi and Dr. S.K. Bhatnagar.

The workshop was inaugurated on September 20, 2019 at J.C. Bose seminar hall of the Institute.

Mr. V. Saravana Kumar (IAS), Director, Department of Science and Technology, Government of Rajasthan was the Chief Guest of the workshop.

Mr Anil Saboo, Chairman & Managing Director of Elektrolites (Power) Pvt. Ltd, Jaipur was the Guest of Honor of the workshop

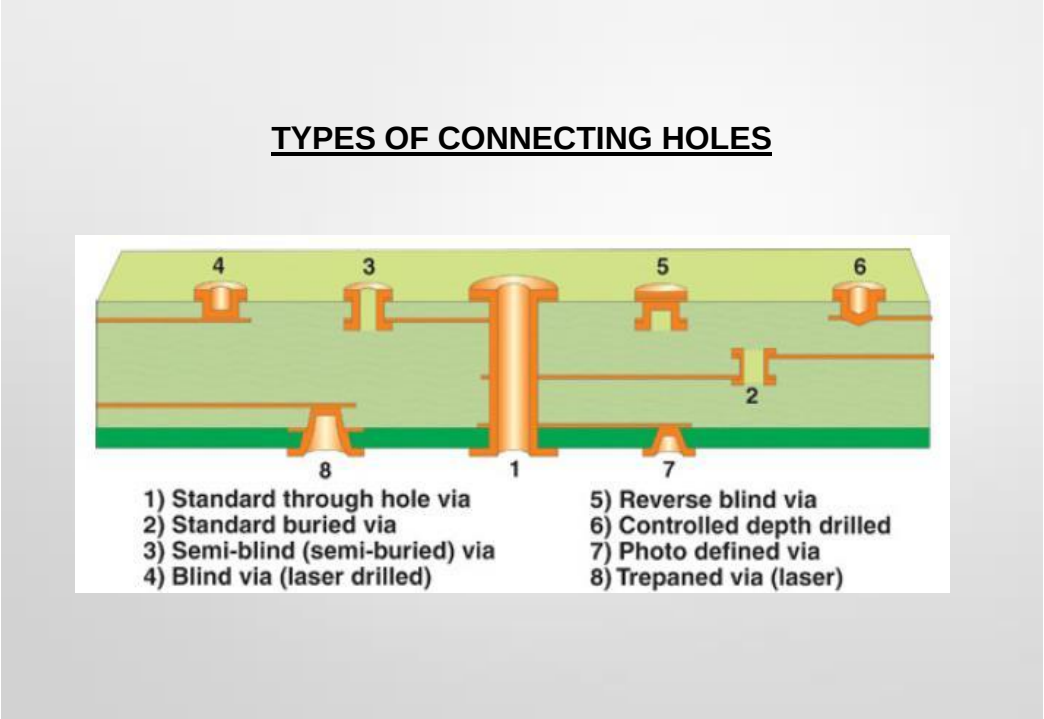
Prof. (Dr.) Vijay Janyani, Chairman, IEEE Rajasthan Subsection was also the Guest of Honor of the worksho

Mr. Jaipal Meel, Director SKIT, Dr. S.L. Surana, Director (Academics), SKIT, Dr. Ramesh Kumar Pachar, Principal, SKIT, Dr. S.K. Bhatnagar, Director

(Research), SKIT, Dr. Mukesh Arora, Head ECE Department, SKIT and participants of workshop attended the inaugural ceremony.

The Chief Guest explained the importance of PCB in electronics and also briefed about the programs run by the DST for students and researchers of technical institutes.
Our main resource person was Mr. U. Nagaraj, General Manager (Quality and Technical), Micropack Ltd, Bangalore, who delivered the lecture on Standards, test procedures and certification requirements for PCB and related products and Design, fabrication and testing issues of multilayer PCB. The Expert talk considered the types of connecting holes and multilayer PCB structure.

Some snapshots of his lectures are:

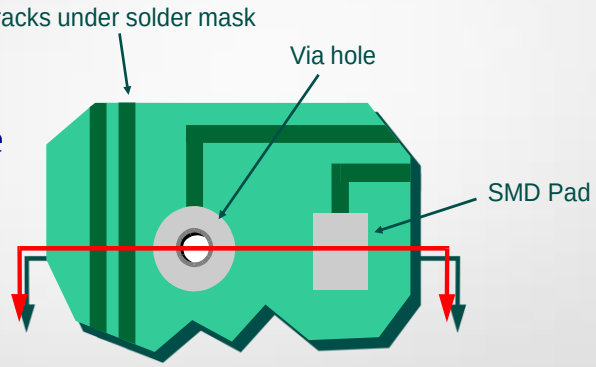


Types of connecting holes

Manufacturing Processes for a Multi-layer PCB

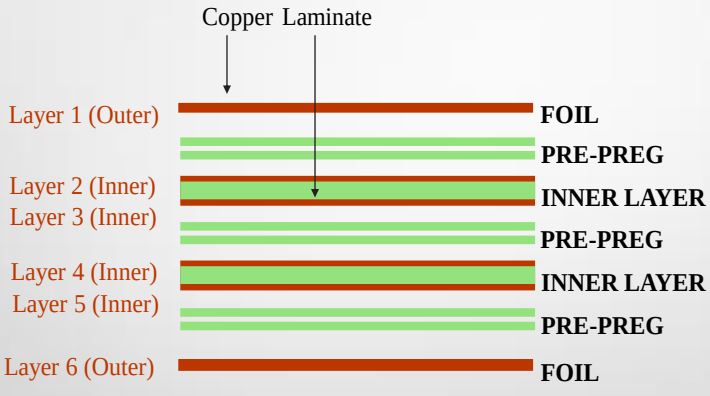
The following presentation covers the main processes during the production of a multi-layer PCB.

The diagrams which follow represent a section through a 6 layer PCB, as indicated in red.



Manufacturing a multi-layer PCB

Typical Layer Construction - 6 Layer PCB



Different layers construction

c. Expected Outcome:

The outcomes included:

- Understanding the PCB fabrication process
- Knowledge about Standards, test procedures and certification requirements for PCB and related products
- Use of schematic capture tools and Gerber file creation.

d. Type: National

3. Details of the Activity

a. Resource person

(Internal from ECE Department):

- Prof. (Dr.) S. K. Bhatnagar
- Mr. Pallav Rawal
- Mr. Ankit Agarwal.
- Ms. Priyanka Sharma
- Ms. Pooja Choudhary
- Ms. Kiran Rathi

(External):

Mr. U. Nagaraj, General Manager (Quality and Technical), Micropack Ltd, Bangalore, who delivered the lecture on Standards, test procedures and certification requirements for PCB and related products and Design, fabrication and testing issues of multilayer PCB.

b. No of participants: 144

List of participants of National Workshop on PCB design and fabrication (PDF 2K19)

Sr. No.	Name
1	Mukesh Arora
2	Swati Arora
3	Shubhi Jain
4	Praveen Kumar Jain
5	Lalit Kumar Lata
6	Jayprakash Vijay
7	PallavRawal

8	Rukhsar Zafar
9	Gloria Joseph
10	Satish Kumar Bhatnagar
11	Sunil Lakhawat
12	Neeraj Jain
13	Manju Choudhary
14	Priyanka Sharma
15	Monika Mathur
16	Kiran Rathi
17	Vikas Pathak
18	Ankit Agarwal
19	Namrata Joshi
20	Satya Narayan Vijayvergiya
21	Pooja Choudhary
22	Harshal Nigam
23	Ravi Kumar Jangir
24	Rahul Pandey
25	Abhinandan Jain
26	Richa Sharma
27	ShanuTripathi
28	Suman Sharma
29	SardarSarabjeet Singh
30	Anil Verma
31	Deendayal
32	Premaram
33	Sunil Acharya
34	SushmaPoonia
35	RuchiMahawar
36	RenuKumari
37	Seema Bhati
38	Dhurendra Singh
39	R S Ola
40	Aadarsh Singh Mertia
41	Aditya Choudhary
42	Akshat Gupta
43	AkshitSaxena
44	Ananya Tiwari
45	AniketRathi
46	Anjali Jain
47	Anjali Parik
48	Anju Choudhary
49	Ansh Garg

50	Aparna Maleti
51	Arpit Agarwal
52	AshvinKhandelwal
53	AviVanawat
54	AyushParasrampuria
55	Bharat Singh
56	Bhunesh Kumar
57	Brijbhushan
58	Charu Shukla
59	Chatrapal Singh
60	Cherrisha Sharma
61	Chinmay Sharma
62	Deepa Kumari
63	Devang Agrawal
64	Gargi Sharma
65	Harsh Khandelwal
66	HimanshuBairwa
67	Ishan Rajvanshi
68	Jatin Bhandari
69	Jayesh Mehta
70	KartikMathur
71	Kashish Sharma
72	Kinjalk Sharma
73	KoustoobhPareek
74	Mahipal Singh Chauhan
75	Manju Choudhary
76	Manvendra Shekhawat
77	Mayank Jain
78	MayankShrimali
79	Monalisa
80	Naman Mishra
81	Nikita Modi
82	Padmakshi Jain
83	Parul Sinha
84	Poorvi Jain
85	Pratik Prakash
86	Priyanka Jain
87	PuneetMathur
88	Quasim Qureshi
89	Rahul Mangal
90	RajkumarVerma

91	Riya Soni
92	Rohit Singh Shekhawat
93	Sandeep Singh Rawat
94	Sanket Sharma
95	Saransh Sharma
96	Saurabh Sharma
97	Shilpi Mittal
98	ShivaniPriyadarshani
99	Shreyash
100	Simran Arora
101	Srashti Sharma
102	Subhash Nagar
103	Surbhi Sen
104	Tanisha Gupta
105	TanmayNayyar
106	TarunAwasthi
107	UjjawalMatolia
108	Vishakha Agarwal
109	Vishal Soni
110	Yash Kumar
111	MohitBalotia(Bc-Me To Ece)
112	Mahak Hussain
113	Akshay Sharma
114	Aman Sharma
115	AniketChaturvedi
116	Ankit Pareek
117	BhanuPratap Singh Rathore
118	Chirag Jain
119	DeepikaKerwal
120	Devendra Aggarwal
121	HarshitSinghal
122	Jitisha S Gupta
123	Kanak Agrawal
124	KeshavHinger
125	Manish Kumar Saini
126	Neha
127	PrernaVerma
128	PriyanshDadheech
129	Rishika Jain
130	Ritik Kala
131	Ritik Sharma

132	Rupam Garg
133	Sushant Kumar
134	Vaibhav Singh Chouhan
135	Atul Gaur
136	RitvikChaturvedi
137	Riya Khandelwal
138	Rishabh Rana
139	Ankit Yadav
140	Bahadur Choudhary
141	Jyoti Sharma
142	Cmaune Sharma
143	Nakshatra Bhardwaj
144	Rajeev Sharma

c. Brief Proceeding of each day of the activity:

Day 1: TUTORIALS

From	To	Program	Speaker	Proposed Title
8:00 am	**9:00 am**	**Registration**		
9:00 am	11:00 am	Tutorial 1	Dr. S. K. Bhatnagar, Director (Research), SKIT, Jaipur	PCB Design Considerations, Design Rules and Fabrication Process
11:00am	11:30 am	TEA Break		
11:30 am	1:00 pm	Tutorial 2 Lab Work	PallavRawal, Ankit Agrawal, SKIT, Jaipur	PCB Circuit and Layout Design on computer
1:15 pm	2:30 pm	Tutorial 3 Lab Work	PallavRawal, Ankit Agrawal, S. K. Bhatnagar, Priyanka Sharma, Pooja Choudhary, Kiran Rathi	G1. PCB fabrication
				G2. Circuit on Proteus
				G3. Visual inspection and PCB processing tools
Day 2: Inauguration and Technical Sessions				
9:00 am	10:00 am	Inauguration and address	Chief Guest	National and international market trends and policies of DST for Project Funding
10:00 am	11:00 am	Key Note Address	Guest of Honor	Quality Assurance for high reliability work
11:00am	11:30 am	High TEA		

11:30 am	1:00 pm	Lab Work	PallavRawal, Ankit Agrawal, S. K. Bhatnagar, Priyanka Sharma, Pooja Choudhary, Kiran Rathi	G1. Visual inspection and PCB processing tools
				G2. PCB fabrication
				G3. Circuit on Proteus
1:00 pm	1:30 pm	LUNCH Break		
1:30 pm	2:30 pm	Invited Talk	Mr. U. Nagaraj GM (Quality and Technical), Micropack Pvt. Ltd, Bangaluru	Evolution of simple PCB to multilayer PCB with SMD components
Day 3: Technical Sessions				
8:45am	9:45am	Invited Talk	Mr. U. Nagaraj, Bengaluru	Design, fabrication and testing issues of multilayer PCB
9:45 am	10:00 am	TEA Break		
10:00 am	11:00 am	Invited Talk	Mr. U. Nagaraj Bengaluru	Standards, test procedures and certification requirements for PCB and related products
11:00am	11:30 am	Tea Break		
11:30am	12:45 pm	Lab Work	PallavRawal, Ankit Agrawal, S. K. Bhatnagar, Priyanka Sharma, Pooja Choudhary, Kiran Rathi	G1. Circuit on Proteus
				G2. Visual inspection and PCB processing tools
				G3. PCB fabrication
12:45pm	1:30 pm	Valedictory Function		
1:30 pm		Lunch		

d. Attainment of the activity: All expected outcomes and objectives were attained by the workshop

e. Recommendations: Such workshops are recommended for future as it is very beneficial for both students and faculty point of view in the field of ECE

4. Enclosures

a. Brochure:

National Workshop on
PCB Design and Fabrication (PDF-2K19)
19th-21st September, 2019
Sponsored by: IEEE MTT SKIT Student Chapter

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ABOUT SKIT
The institute is inspired from the learning's of Swami Keshvanand Ji. The Institute is affiliated to Rajasthan Technical University, Kota and approved by All India Council for Technical Education (AICTE), Ministry of Human Resource Development, and government of India to offer Doctoral, Postgraduate and Graduate Courses in Engineering. The B. Tech. Programme of CS, EE, ME, ECE and IT departments of institute are accredited by National Board of Accreditation (NBA).

DEPARTMENT OF ECE
We have a rich tradition in research and teaching. All efforts are subtly harnessed with the aim of preparing the budding engineers to face the challenging dimensions of technical excellence in various areas of engineering.

Printed Circuit Boards provide electronic connections and mechanical support to electronic components and assemblies. Conductive tracks, pads and other features etched from copper sheets laminated onto a non-conductive substrate to connect capacitors, resistors or active devices which are generally soldered on the Printed Circuit Board. We can't rely upon bread board for substantially increased number of components and for smaller packaging sizes of Integrated circuits that's makes PCB more essential. It is more of an art than just science with lots of scope for designer.

Programme topics

A Computerized capture of electronic designs
B Introduction to PCB Layout
C PCB Designing (Single and Multi-Layer)
D Testing Issue and Test Procedure

Objective of the workshop

- **Understanding of the steps and processes involved in PCB design Process**
- **PCB Fabrication Process**
- **Schematic Capture using Industry Standard Schematic Capture tools**
- **Preparation of Board for Layout**
- **Gerber file Creation and View**
- **Practical hands on to demonstrate PCB fabrication of a circuit.**

Speakers

- **Mr. U. Nagaraj, GM (Quality and Technical), Micropack Ltd., Bengaluru.**
- **Ms. Meenakshi Jwala, Director, Electronic Testing & Development Corporation, Jaipur.**
- **Dr. S. K Bhatnagar, Director (Research), SKIT Jaipur.**

Programme coordinators

Ankit Agarwal	ankit.agarwal@skit.ac.in	7877556914
Pallav Rawal	prawal87@gmail.com	9887487953

Registration

Registration is open to students, faculty, industry persons, research scholar of all the branches of Engineering. Participants will be admitted on a *first-come first-serve basis*. Selected participants will be notified on or before 16th September, 2019.

Fee

(A) The registration fees for Participant (outside SKIT) is Rs.600/-
(B) The fee covers the participation in the programme along with Tea & lunch on all the days of the workshop.
(C) The travel and other expenses would have to be borne by the participants or their parent organizations.
(D) Lodging for very limited number of outside participants is available on first-come first-served and additional payment basis.
(E) The registration is to be done by filling the Google form at link: https://forms.gle/UDg8U3aeYNhVvJHu7

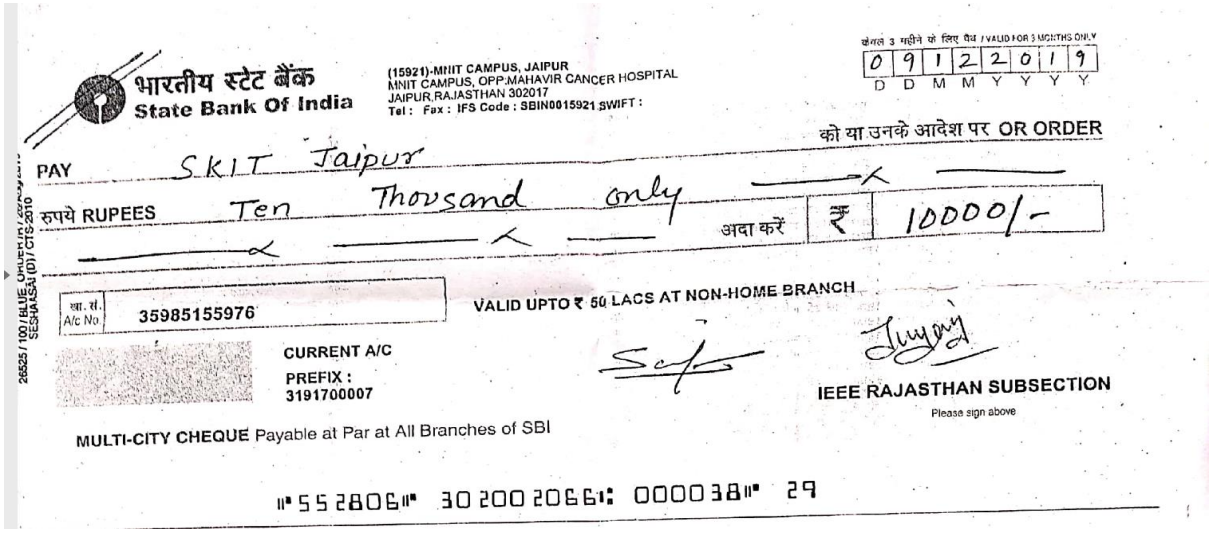
❖ **No Registration Fees for IEEE and IETE Members**

Further query: Please contact the programme coordinators.

Orgranised By:
Department of Electronics and Communication Engineering
Swami Keshvanand Institute of Technology, Management and Gramothan, Ramnagaria, Jagatpura, Jaipur

b. Detail of funding if any:

The workshop was funded by IEEE Rajasthan subsection by an amount of 10000 rupees as below: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c. Souvenir: NIL

d. Proceedings: NIL

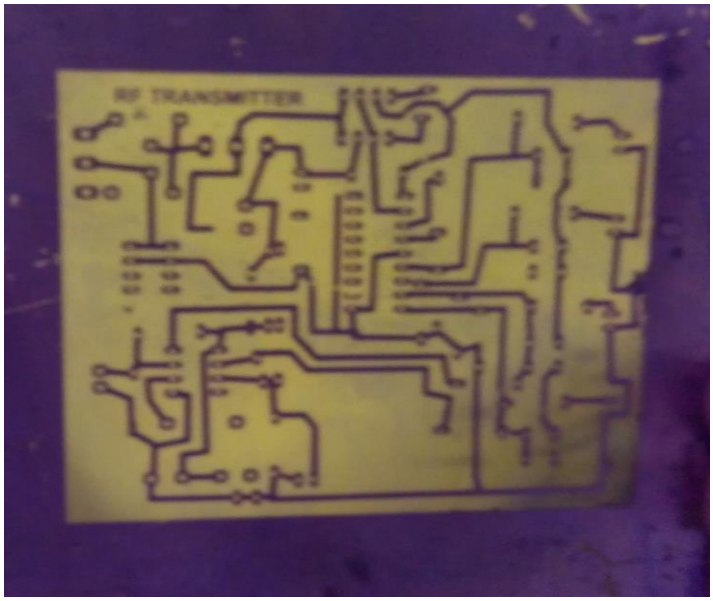
e. Photographs:

Some Glimpse of Lab Session running parallel

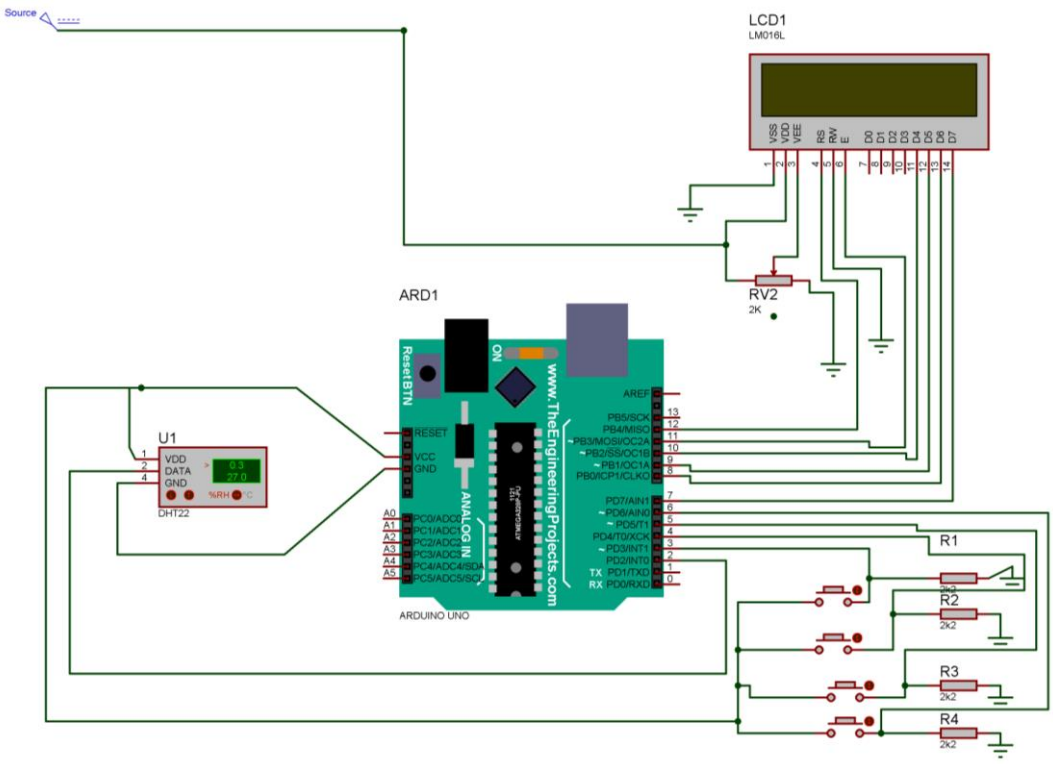
Layout being designed on software

Instructions as given by the resource person

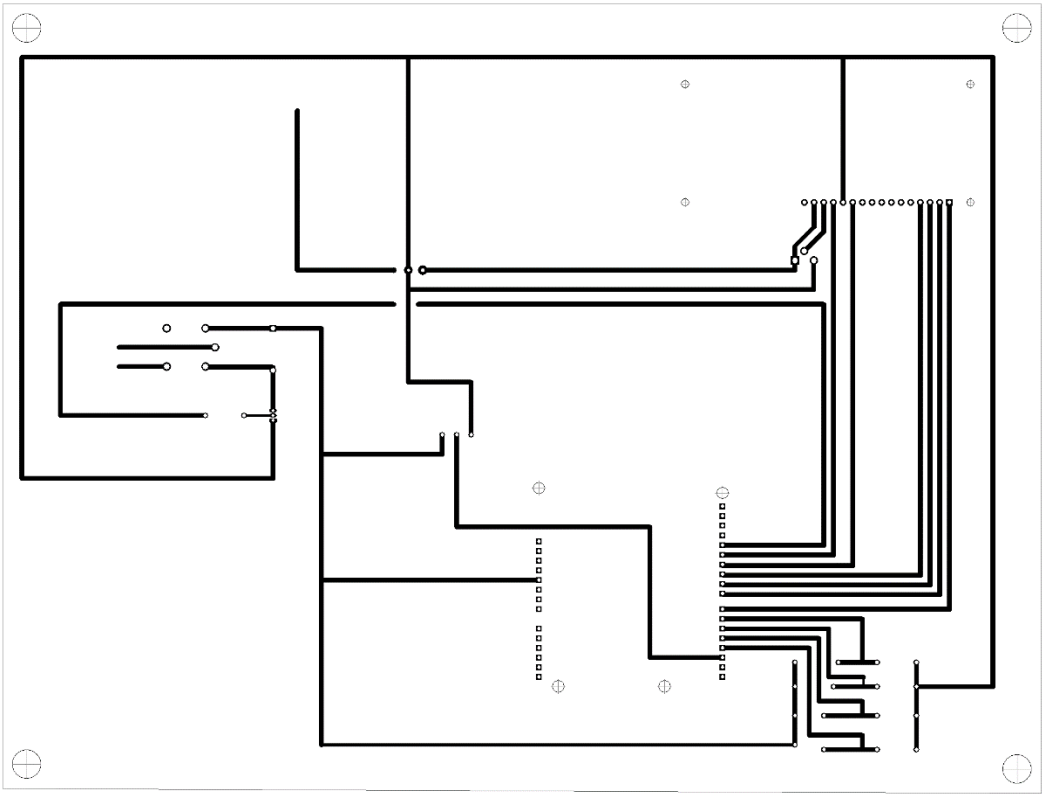
Reflow soldering machine designed and developed by ECE Department, SKIT was inaugurated in the presence of Mr. U Nagaraj (Resource person for the workshop)



In PCB Fabrication Lab students fabricated the PCB (RF Transmitter Circuit)



In Circuit designing lab session students designed the circuit of sensor and LCD Interface on proteus software



In PCB layout Design students got aware about Dip trace software. They design the PCB layout on dip trace software.

Media Coverage:

News of this event was covered by different Newspapers. Some newspaper cuttings are as follows:

एसकेआईटी में तीन दिवसीय वर्कशॉप शुरू

जयपुर ◆ जगतपुरा रामनगरिया स्थित एसकेआईटी कॉलेज में शुक्रवार को प्रिन्टेड सर्किट बोर्ड डिजाइन एवं फैब्रिकेशन पर तीन दिवसीय वर्कशॉप की शुरुआत हुई। डॉयरेक्टर डीएसटी राजस्थान के वी.सरवन कुमार मुख्य अतिथि व गेस्ट ऑफ ऑनर अनिल साबू, यू. नागराज, प्रो. विजय जनयानी, संस्था के डायरेक्टर जयपाल मील, डायरेक्टर एकेडमिक्स डॉ. एस. एल. सुराना, प्राचार्य डॉ. रमेश कुमार पचार, डायरेक्टर रिसर्च प्रो. एस. के. भटनागर एवं विभागाध्यक्ष प्रो. मुकेश अरोड़ा उपस्थित थे। मुख्य अतिथी ने अभियांत्रिकी के क्षेत्र में पीसीबी डिजाइन की उपयोगिता व राजस्थान सरकार की ओर से प्रायोजित डीएसटी की विभिन्न योजनाओं के बारे में बताया।

विद्यार्थियों को बताई डीएसटी की विभिन्न योजनाएं

जयपुर (कासं)। एसकेआईटी में शुक्रवार को इलैक्ट्रोनिक्स एंड कम्युनिकेशन विभाग के द्वारा प्रिन्टेड सर्किट बोंड डिजाइन एवं फेब्रिकेशन पर तीन दिवसीय वर्कशॉप की शुरूआत हुई। इस अवसर पर वर्कशॉप के मुख्य अतिथी डॉयरेक्टर डीएसटी राजस्थान आई.ए.एस वी. सरवन कुमार, चेयरमैन एव एम.डी. इलेक्ट्रोलाइट्स प्रा. लिमिटेड गेस्ट ऑफ ऑनर अनिल साबू, जीएम माईक्रोपेक लिमिटेड यू. नागराज, एवं चैयरमैन आईईईई राजस्थान सब सेक्शन प्रो. विजय जनयानी, संस्था के डायरेक्टर जयपाल मील, डायरेक्टर (एकेडमिक्स) डॉ एस. एल. सुराना, प्राचार्य डॉ. रमेश कुमार पचार, डायरेक्टर रिसर्च प्रो. एस.के. भटनागर एवं विभागाध्यक्ष प्रो. मुकेश अरोड़ा उपस्थित थे। कार्यक्रम के शुरूआत मे मुख्य अतिथी वी. सरवन ने अभियांत्रिकी के क्षेत्र में पी.सी.बी. डिजाईन की उपयोगिता के बारे में बताया। राजस्थान सरकार द्वारा प्रायोजित डीएसटी की विभिन्न योजनाओं के बारे में छात्रों को अवगत कराया।