

Requisition Letter

From,

Head of the Department,
Department of Electronics and Communication Engineering,
J.K.K.Munirajah College of Technology,
T.N.Palayam.

Permitted
[Signature]

To,

The Principal,
J.K.K.Munirajah College of Technology,
T.N.Palayam.

Respected Sir,

Sub: Seeking permission for conducting a Certificate Program-Reg

We have planned to conduct a certificate program for II, III and IV-year ECE students on "PCB Designing and Fabrication" from 11.12.2023 to 16.12.2023 by program coordinator Mrs.M.Sivaranjani AP/ECE. So, I request you to kindly provide permission to conduct the certificate program.

Thanking You,

Yours Truly,

Place: T.N.Palayam

Date: 30.11.2023

[Signature]

Principal
J.K.K.Munirajah College of Technology
(Autonomous)
T.N.Palayam, Gobi (Tk),
Erode (Dt) - 638 506

[Signature]



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JKKMCT/CIRCULAR/96/DEC-2023

DATE: 01/12/2023

CIRCULAR

The Department of Electronics and Communication Engineering is planning to organize a Certificate Program on "**PCB Designing and Fabrication**" (36 Hours) for the benefit of the students from **11.12.2023 (Monday) to 16.12.2023 (Saturday)**. Students those who are willing to attend the program can enroll their names to their class in-charges respectively on or before 04.12.2023.



11/12/23
PRINCIPAL

Copy To,

All the HODs and Staff Members,

The Student's circulation,

Notice boards and File copy


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Department of Electronics and Communication Engineering

PROGRAM SYLLABUS

Name of the Certificate Program : **PCB Designing and Fabrication**
Program Code : 22ECEPDFCP01
Name of the Program Coordinator : Mrs.M.Sivaranjani

Academic Year: 2023-2024

Program Contents

Total Hours: 36

Chapter 1 : Introduction to PCB designing concepts

- Introduction to PCB
- Single layer PCBs, Multilayer PCBs and Multiwire PCB
- Board Outlines and Cutouts
- Drill Details
- Components Outlines
- PCB Materials
- PCB Types
- Rules for Track
- Application Circuits
- Study of IPC Standards

Chapter 2 : Components, devices and their packages

- Fundamental of electronic components
- Component Package Types
- Basic electronic circuits
- Understanding the schematic Entry
- Creating Library & Components
- Drawing a Schematic
- PCB Board designing
- Layout planning
- Schematic to PCB Conversion
- General rules and parameters

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Chapter 3 : Design and Development tools

- Introduction to Electronic design automation (EDA) tools for PCB designing
- Brief Introduction of various simulators
- SPICE and PSpice Environment
- Introduction and Working of PROTEUS
- Selecting the Components Footprints as per design
- Making New Footprints, Assigning Footprint to components
- Net listing
- PCB Layout Designing
- Auto routing and manual routing
- Assigning specific text (silkscreen) to design
- Creating report of design
- Creating manufacturing data (GERBER) for design.

Chapter 4 : Printing process and quality control

- Introduction printed circuit board production techniques
- Photo printing
- Film -master production
- Reprographic camera
- Basic process for double sided PCBs
- Screen printing process
- Plating , relative performance
- Quality control
- Etching machines
- Solders alloys, fluxes, soldering techniques.
- Soldering methods
- Types soldering irons
- PCB soldering
- different soldering techniques
- Necessary soldering equipment
- Steps to PCB soldering

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Chapter 5 : PCB Designing Practice

- Making the schematic of Academic and Industrial projects
- PCB Designing of these projects
- Soldering and De-soldering of components as per Design
- Testing and Troubleshooting Methods
- Analyzing and validating power performance.
- Hands on project

Prepared by:

Name: Mrs.M.Sivaranjani

Designation: AP/ ECE

PROGRAM COORDINATOR

HOD

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Department of Electronics and Communication Engineering



Academic Year 2023-2024

Certificate Program on "PCB Designing and Fabrication"

Schedule Plan

Dates	09:30 AM to 11:30AM (2 Hrs)		11.45 AM to 1.15 PM (1.30 Hrs)		2:00 PM to 4.30 PM (2.30 Hrs)
11.12.2023	Introduction to PCB Technology	BREAK	PCB Materials	LUNCH	PCB Types
12.12.2023	Description of PCB Layers		Rules for Track and Application Circuits		Study of IPC Standards, Component Package Types
13.12.2023	Schematic to PCB Conversion		PCB Designing Flow Chart		Introduction to Development Tools
14.12.2023	SPICE and PSpice Environment		PCB Layout Designing		Printing Process
15.12.2023	Screen printing process		Quality control		Troubleshooting PCB
16.12.2023	Making the schematic of Academic and Industrial projects		PCB Designing of these projects		Hands on training Questions and feedback

PROGRAM COORDINATOR

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Department of Electronics and Communication Engineering

Academic Year 2023-2024

Resource Person Profile

Title of the Program	PCB Designing and Fabrication
Duration and Timing of the Program	36 Hours & 9.30 AM to 4.30 PM
Name of the Resource Person	Mrs.M.Sivaranjani
Photo Image of the Resource Person	
E-mail	sivaranjanim@jkkmct.edu.in
Mobile No	9952251059
Designation	Assistant Professor / ECE
Official Address	Department of ECE, J.K.K.Munirajah College of Technology, T.N.Palayam, Gobi(tk), Erode(Dt) - 638506
Educational Qualification	B.E (Electronics and Communication Engineering), M.E (Applied Electronics)
Experience	Six years of Teaching experience as an assistant professor in our college.
Field of Interest	Electronic Devices, Digital system design, Analog IC Design

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Department of Electronics and Communication Engineering

Academic Year 2023-2024

Certificate Program on "PCB Designing and Fabrication"

Students Willing List

S.NO	REGISTER NUMBER	STUDENT NAME	WILLING STUDENTS SIGNATURE
FINAL YEAR			
1	731220106002	KALYAN K	K. Kalyan
2	731220106004	KUDIYARASU P	P. Kudiyarasu
3	731220106005	MUTHUKUMAR M	M. Muthukumar
4	731220106007	SUGUNA DEVI M	M. Suguna Devi
5	731220106301	JANARTHANAN K	K. Janarthanan
THIRD YEAR			
6	731221106007	NARMATHA M	M. Narmatha
7	731221106008	RANJITH B	B. Ranjith
8	731221106009	SAKTHISIVAN K	K. Sakthisivan
9	731221106010	SANTHIYA Y	Y. Santhiya
10	731221106011	SATHASIVAN R	R. Sathasivan
11	731221106012	SHARMILA V	V. Sharmila
12	731221106014	SUBASH K	Not willing
13	731221106015	VENEESWARI M	M. Veneeswari
14	731221106301	ARTHI V	V. Arthi
15	731221106302	SHARMILA V	V. Sharmila
16	731221106303	SOUNDARIYA S	S. Soundariya
SECOND YEAR			
17	731222106001	ABISHEK A	A. Abishek
18	731222106002	AMBIKA A	A. Ambika
19	731222106003	ARCHANA K	K. Archana
20	731222106004	ARCHANA P	P. Archana
21	731222106005	BALAJI S	S. Balaji
22	731222106006	DEVI U	U. Devi
23	731222106007	DHANRAJ R	Not willing
24	731222106008	DHARANI K S	S. Dharaani
25	731222106010	DINESH S	S. Dinesh
26	731222106011	HARIHARAN B	B. Hariharan
27	731222106012	HARINI S	S. Harini

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S.NO	REGISTER NUMBER	STUDENT NAME	WILLING STUDENTS SIGNATURE
28	731222106013	INDRAJITH A	A. Prasad
29	731222106015	JEEVA DEEPIKA S	Jeeva
30	731222106016	LAVANYA M	Lavanya M
31	731222106017	MAGENDHRA K	K. Mahesh
32	731222106018	NARMADHA N	Narmadha
33	731222106019	NIVASH V	Nivash
34	731222106020	PAVADHARANI K	K. Pavadharani
35	731222106021	PRASANTH P	P. Pranth
36	731222106022	RAGAVAN S	Ragavan
37	731222106025	RISHIKESAN R	R. Rishikesan
38	731222106026	RIYAS MOHAMMED M	M. Riyas
39	731222106027	ROGAN B	B. Rogan
40	731222106028	SANTHOSH E	Not willing
41	731222106030	SIVARANJANI G	G. Sivarajani
42	731222106031	SUDHI A	A. Sudhi
43	731222106034	THILAK M	M. Thilak
44	731222106035	VAISHNAVI A	A. Vaishnavi
45	731222106036	VIGNESH V	V. Vignesh
46	731222106037	VIJAYAKUMARI M	M. Vijayakumari
47	731222106302	ARTHI M	M. Arthi
48	731222106307	JEEVITHA P	P. Jeevitha
49	731222106309	KALAMANI G	G. Kalamani
50	731222106311	LOGESHWARAN D	Not willing
51	731222106314	NIBILA SRI P	P. Nibila
52	731222106318	RAJESHKANNAN R	Rajeshkannan
53	731222106322	SARAVANAN S	Not willing
54	731222106323	SIBIYON K	K. Sibiyan
55	731222106325	THAMARAISELVI A	A. Thamaraiselvi
56	731222106328	VAIDEGI M	Not willing
57	731222106501	KAVIYARASU S	S. Kaviyarasu

M. Sibiyan
PROGRAM COORDINATOR

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Department of Electronics and Communication Engineering
Academic Year 2023-2024

Certificate Program on "PCB Designing and Fabrication"
Enrolled Students Name List

S.NO	REGISTER NUMBER	STUDENT NAME
FINAL YEAR		
1	731220106002	KALYAN K
2	731220106004	KUDIYARASU P
3	731220106005	MUTHUKUMAR M
4	731220106007	SUGUNA DEVI M
5	731220106301	JANARTHANAN K
THIRD YEAR		
6	731221106007	NARMATHA M
7	731221106008	RANJITH B
8	731221106009	SAKTHISIVAN K
9	731221106010	SANTHIYA Y
10	731221106011	SATHASIVAN R
11	731221106012	SHARMILA V
12	731221106015	VENEESWARI M
13	731221106301	ARTHI V
14	731221106302	SHARMILA V
15	731221106303	SOUNDARIYA S
SECOND YEAR		
16	731222106001	ABISHEK A
17	731222106002	AMBIKA A
18	731222106003	ARCHANA K
19	731222106004	ARCHANA P
20	731222106005	BALAJI S
21	731222106006	DEVI U
22	731222106008	DHARANI K S
23	731222106010	DINESH S
24	731222106011	HARIHARAN B
25	731222106012	HARINI S
26	731222106013	INDRAJITH A
27	731222106015	JEEVA DEEPIKA S
28	731222106016	LAVANYA M
29	731222106017	MAGENDHRA K
30	731222106018	NARMADHA N
31	731222106019	NIVASH V
32	731222106020	PAVADHARANI K

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S.NO	REGISTER NUMBER	STUDENT NAME
33	731222106021	PRASANTH P
34	731222106022	RAGAVAN S
35	731222106025	RISHIKESAN R
36	731222106026	RIYAS MOHAMMED M
37	731222106027	ROGAN B
38	731222106030	SIVARANJANI G
39	731222106031	SUDHI A
40	731222106034	THILAK M
41	731222106035	VAISHNAVI A
42	731222106036	VIGNESH V
43	731222106037	VIJAYAKUMARI M
44	731222106302	ARTHI M
45	731222106307	JEEVITHA P
46	731222106309	KALAMANI G
47	731222106314	NIBILA SRI P
48	731222106318	RAJESHKANNAN R
49	731222106323	SIBIYON K
50	731222106325	THAMARAISELVI A
51	731222106501	KAVIYARASU S

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Department of Electronics and Communication Engineering

Academic Year 2023-2024

Certificate Program on "PCB Designing and Fabrication"

Attendance Details

S.NO	NAME OF THE STUDENT	ATTENDANCE OF THE PARTICIPANTS											
		11.12.2023		12.12.2023		13.12.2023		14.12.2023		15.12.2023		16.12.2023	
		FN	AN	FN	AN	FN	AN	FN	AN	FN	AN	FN	AN
FINAL YEAR													
1	KALYAN K	/	/	/	/	/	/	/	/	/	/	/	/
2	KUDIYARASU P	/	/	/	/	/	/	/	/	/	/	/	/
3	MUTHUKUMAR M	/	/	/	/	/	/	/	a	/	/	/	/
4	SUGUNA DEVI M	/	/	/	/	/	/	/	/	/	/	/	/
5	JANARTHANAN K	/	/	/	/	/	/	/	/	/	/	/	/
THIRD YEAR													
6	NARMATHA M	/	/	/	/	/	/	/	/	/	/	/	/
7	RANJITH B	/	/	/	/	/	/	/	/	/	/	/	/
8	SAKTHISIVAN K	/	/	/	/	/	/	/	/	/	/	/	/
9	SANTHIYA Y	/	/	/	/	/	/	/	/	/	/	/	/
10	SATHASIVAN R	/	/	a	/	/	/	a	a	a	/	/	/
11	SHARMILA V	/	/	/	/	/	/	/	/	/	/	/	/
12	VENEESWARIM	/	/	/	/	/	/	/	/	/	/	/	/
13	ARTHI V	/	/	/	/	/	/	/	/	/	/	/	/
14	SHARMILA V	/	/	/	/	/	/	/	/	/	/	/	/
15	SOUNDARIYA S	/	/	/	/	/	/	/	/	/	/	/	/
SECOND YEAR													
16	ABISHEK A	/	/	/	/	/	/	/	/	/	/	/	/
17	AMBIKA A	/	/	/	/	/	/	/	/	/	/	/	/
18	ARCHANA K	/	/	/	/	/	/	/	/	/	/	/	/
19	ARCHANA P	/	/	/	a	/	/	/	/	/	/	/	/
20	BALAJI S	/	/	/	/	/	/	a	/	/	/	/	/
21	DEVI U	/	/	/	/	/	/	/	/	/	/	/	/
22	DHARANI K S	/	/	/	/	/	/	/	/	/	/	/	/
23	DINESH S	/	/	/	/	/	/	/	/	/	/	/	/
24	HARIHARAN B	/	/	/	/	/	/	/	/	/	/	/	/
25	HARINI S	/	/	/	/	/	/	/	/	/	/	/	/
26	INDRAJITH A	/	/	/	/	/	/	/	/	/	/	/	/
27	JEEVA DEEPIKA S	/	/	/	/	/	/	/	/	/	/	/	/
28	LAVANYA M	/	/	/	/	/	/	/	/	/	/	/	/
29	MAGENDHRA K	/	/	a	/	/	/	/	/	/	/	/	/
30	NARMADHA N	/	/	/	/	/	/	/	/	/	/	/	/
31	NIVASH V	/	/	/	/	/	/	/	/	/	/	/	/
32	PAVADHARANI K	/	/	/	/	/	/	/	/	/	/	/	/

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		11.12.2023		12.12.2023		13.12.2023		14.12.2023		15.12.2023		16.12.2023	
		FN	AN	FN	AN	FN	AN	FN	AN	FN	AN	FN	AN
33	PRASANTH P	/	/	/	/	/	/	/	/	/	/	/	/
34	RAGAVAN S	/	/	/	/	/	/	/	/	/	/	/	/
35	RISHIKESAN R	/	/	/	/	/	/	/	/	/	/	/	/
36	RIYAS MOHAMMED M	/	/	/	/	/	/	/	/	/	/	/	/
37	ROGAN B	/	/	/	/	/	/	a	/	/	/	/	/
38	SIVARANJANI G	/	/	/	/	/	/	/	/	/	/	/	/
39	SUDHI A	/	/	/	/	/	/	/	/	/	/	/	/
40	THILAK M	/	/	/	/	/	/	/	/	/	/	/	/
41	VAISHNAVI A	/	/	/	/	/	/	/	/	/	/	/	/
42	VIGNESH V	/	/	/	/	/	/	/	/	/	/	/	/
43	VIJAYAKUMARI M	/	/	/	/	/	/	/	/	/	/	/	/
44	ARTHI M	/	/	a	/	/	/	/	/	/	/	/	/
45	JEEVITHA P	/	/	/	/	/	/	/	/	/	/	/	/
46	KALAMANI G	/	/	/	/	/	/	/	/	/	/	/	/
47	NIBILA SRI P	/	/	/	/	/	/	/	/	/	/	/	/
48	RAJESHKANNAN R	a	a	/	/	/	/	a	a	/	a	/	/
49	SIBIYON K	/	/	a	/	a	a	/	/	a	a	/	/
50	THAMARAISELVI A	/	/	/	/	/	/	/	/	/	/	/	/
51	KAVIYARASU S	/	/	/	/	/	/	/	/	/	/	/	/
Total No. of Present		50	50	47	50	50	50	47	48	49	49	51	51
Total No. of Absent		01	01	04	01	01	01	04	03	02	02	-	-
Signature of Program Coordinator													
Signature of HOD													

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Department of Electronics and Communication Engineering

Academic Year 2023-2024



Certificate Program on "PCB Designing and Fabrication"

Assessment Details

1. Which type of PCB has a single conductive layer?
A) Multilayer PCB
B) Multiwire PCB
C) Single-layer PCB
D) Hybrid PCB
2. IPC standards are primarily used for:
A) Design automation
B) PCB material testing
C) Quality assurance
D) Electrical safety
3. Track width in PCBs primarily depends on:
A) Board size
B) Current capacity
C) Number of components
D) Voltage rating
4. Which is an example of an active component?
A) Resistor
B) Capacitor
C) Diode
D) Inductor
5. What is a TO-92 package used for?
A) Microcontrollers
B) Power transistors
C) Small-signal transistors
D) ICs
6. Which file format is typically used to create a PCB schematic?
A) .pdf
B) .sch
C) .gerber
D) .pcb

Principal

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7. What is the first step in PCB design?
- A) Routing
 - B) Schematic entry
 - C) Library creation
 - D) Netlisting
8. Which parameter is not relevant in PCB layout planning?
- A) Component size
 - B) Board shape
 - C) Ambient temperature
 - D) Power source type
9. What does SPICE stand for in simulation?
- A) Simple Process Integrated Circuit Environment
 - B) Simulation Program with Integrated Circuit Emphasis
 - C) Standard Program for IC Emulation
 - D) Schematic Process with Integrated Components
10. PROTEUS is used for:
- A) PCB fabrication
 - B) Simulation and PCB design
 - C) Material testing
 - D) Quality control
11. What is auto-routing in PCB design?
- A) Manual placement of tracks
 - B) Automated generation of track connections
 - C) Assigning text to silkscreen
 - D) Netlist creation
12. Which data format is used for manufacturing PCBs?
- A) SPICE
 - B) XML
 - C) GERBER
 - D) JSON
13. Footprints in PCB design refer to:
- A) Thermal dissipation areas
 - B) Physical dimensions of components
 - C) Track layouts
 - D) Silkscreen text

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14. What is the primary technique used for double-sided PCB production?
- A) Film-master production
 - B) Etching
 - C) Screen printing
 - D) Soldering
15. Which flux is commonly used for soldering?
- A) Lead flux
 - B) Rosin flux
 - C) Acid flux
 - D) Base flux
16. Which machine is used for etching PCBs?
- A) Drilling machine
 - B) CNC machine
 - C) Etching machine
 - D) Reprographic camera
17. Which method is used to troubleshoot a faulty PCB?
- A) Visual inspection
 - B) Power testing
 - C) Circuit simulation
 - D) All of the above
18. What is the primary goal of PCB testing?
- A) Aesthetic validation
 - B) Functionality verification
 - C) Cost estimation
 - D) Component replacement
19. Desoldering is the process of:
- A) Removing soldered components
 - B) Adding flux to solder joints
 - C) Increasing solder joint strength
 - D) Reducing soldering temperature
20. Which PCB type is suitable for high-density designs?
- A) Single-layer PCB
 - B) Multilayer PCB
 - C) Multiwire PCB
 - D) Double-sided PCB

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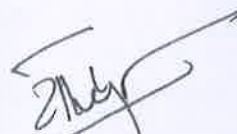



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21. What is the primary purpose of board cutouts?
- A) To reduce weight
 - B) To allow for mechanical fitting
 - C) To enhance electrical performance
 - D) To simplify routing
22. Which component package type is ideal for surface mounting?
- A) DIP
 - B) SMD
 - C) TO-220
 - D) QFP
23. Netlisting is used to:
- A) Connect components logically
 - B) Create footprints
 - C) Add silkscreen text
 - D) Perform soldering
24. Which soldering technique uses hot air for soldering?
- A) Wave soldering
 - B) Reflow soldering
 - C) Hand soldering
 - D) Dip soldering
25. Which tool is used to analyze power performance in a PCB?
- A) Power supply analyzer
 - B) Multimeter
 - C) Oscilloscope
 - D) All of the above


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Department of Electronics and Communication Engineering

Academic Year 2023-2024

Certificate Program on "PCB Designing and Fabrication"

Assessment Result

S.NO	REGISTER NUMBER	STUDENT NAME	MARRKS
FINAL YEAR			
1	731220106002	KALYAN K	84
2	731220106004	KUDIYARASU P	80
3	731220106005	MUTHUKUMAR M	76
4	731220106007	SUGUNA DEVI M	88
5	731220106301	JANARTHANAN K	92
THIRD YEAR			
6	731221106007	NARMATHA M	88
7	731221106008	RANJITH B	76
8	731221106009	SAKTHISIVAN K	84
9	731221106010	SANTHIYA Y	96
10	731221106011	SATHASIVAN R	36
11	731221106012	SHARMILA V	92
12	731221106015	VENEESWARI M	92
13	731221106301	ARTHI V	84
14	731221106302	SHARMILA V	80
15	731221106303	SOUNDARIYA S	84
SECOND YEAR			
16	731222106001	ABISHEK A	72
17	731222106002	AMBIKA A	68
18	731222106003	ARCHANA K	68
19	731222106004	ARCHANA P	84
20	731222106005	BALAJI S	72
21	731222106006	DEVI U	80
22	731222106008	DHARANI K S	76
23	731222106010	DINESH S	64
24	731222106011	HARIHARAN B	76
25	731222106012	HARINI S	84
26	731222106013	INDRAJITH A	92
27	731222106015	JEEVA DEEPIKA S	96
28	731222106016	LAVANYA M	88
29	731222106017	MAGENDHRA K	72
30	731222106018	NARMADHA N	72
31	731222106019	NIVASH V	80
32	731222106020	PAVADHARANI K	96
33	731222106021	PRASANTH P	92

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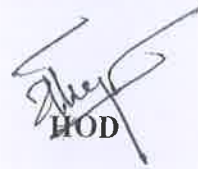
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S.NO	REGISTER NUMBER	STUDENT NAME	MARRKS
34	731222106022	RAGAVAN S	72
35	731222106025	RISHIKESAN R	80
36	731222106026	RIYAS MOHAMMED M	88
37	731222106027	ROGAN B	72
38	731222106030	SIVARANJANI G	80
39	731222106031	SUDHI A	84
40	731222106034	THILAK M	92
41	731222106035	VAISHNAVI A	84
42	731222106036	VIGNESH V	92
43	731222106037	VIJAYAKUMARI M	80
44	731222106302	ARTHI M	76
45	731222106307	JEEVITHA P	72
46	731222106309	KALAMANI G	80
47	731222106314	NIBILA SRI P	76
48	731222106318	RAJESHKANNAN R	24
49	731222106323	SIBIYON K	20
50	731222106325	THAMARAISELVI A	84
51	731222106501	KAVIYARASU S	96

Note : The students who secured 50 Marks and above are eligible to get certificates.


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Department of Electronics and Communication Engineering



Academic Year 2023-2024

SUMMARY/OUTCOME REPORT

Name of the Certificate Program : **PCB Designing and Fabrication**
Program Code : 22ECEPDFCP01
Name of the Program Coordinator : Mrs.M.Sivaranjani
Number of Students Enrolled : 51
Number of Students Completed : 48 **Duration : 36 Hours**

I hereby affirm that the entire program contents in the Certificate Program "**PCB Designing and Fabrication**" listed in the certificate program Syllabus have been actually learned by the students as the part of the prescribed co-curricular activities through certificate program by NAAC and NBA.

I confirmed that the Certificate program title as **PCB Designing and Fabrication** was done by me in the beginning of this semester and program delivery with attendance of the students were recorded.

I confirmed that all registered students for this Certificate program were actively attended and performed well throughout the duration of this program and all students were successfully completed and eligible to receive the participation certificate.

Outcome: Students shall able to gain knowledge in

- (i) Analyzing and describing the types and construction of single-layer, multilayer, and Multiwire PCBs.
- (ii) Exploring the principles of schematic entry, component packaging, and **PCB layout design**.
- (iii) Designing and analyzing PCBs using EDA tools such as SPICE, PSPICE, and PROTEUS.
- (iv) Developing practical skills in **PCB fabrication**, soldering, and quality control techniques.
- (v) Identifying troubleshooting methods and testing strategies for validating PCB performance in real-world applications.


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