PUNYASHLOK AHILYADEVI HOLKAR SOLAPUR UNIVERSITY, SOLAPUR

SKILL DEVELOPMENT CENTRE

पुण्यश्लोक अहिल्यादेवी होळकर
सोलापूर विद्यापीठ
॥ विद्यया संपन्नता ॥

Course Name: Certificate course in PCB Design and Manufacturing using Proteus CAD

Year- 2023

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

SKILL DEVELOPMENT CENTRE

Course Name: "Certificate course in PCB Design andManufacturing using Proteus CAD"

Syllabus

Duration of Course: 3 months

Need of Course:

1. Technical Skill improvement
2. Employability
3. Testing and troubleshooting of PCB.

Employment and Entrepreneurship Opportunities from Course:

1. High demand in the electronics industry
2. opening up various job prospects In PCB making industry.

Tentative Fees: 2000/-

Minimum Admission Eligibility for Student: 12th Pass

Teacher's Eligibility: M. Sc, B. Sc, B.E & Diploma

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Dr. P.M. Gavhane

mr. Mule S.S

Dr. V.D. Bachuwar

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

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Syllabus Structure

Course Duration :3 Months

Name of Skill Course	Duration	Name of Paper	Paper	Hours Per Paper	Th.	Int.	Pract.	Credits
Certificate Course in PCB Design and Manufacturing using Proteus CAD"	3 Months	1) Introduction to PCB	I	45	80	20	0	3 Credits
		2) PCB Layers & Design Rules	II	45	80	20	0	3 Credits
		3) PCB design of Analog circuit & Digital circuit	III	90	0	0	100	3 Credits
Total				**180**	**160**	**40**	**100**	**9 Credits**

Abbrevations :

Th.- Theory Evaluation,
Int.- Internal Evalution,
Pract.- Practical Evalution.

Dr. P.M. Gavhane

Punyashlok Ahilyadevi Holkar Solapur University, Solapur

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Course Title : "Certificate course in PCB Design andManufacturing using Proteus CAD"

SYLLABUS Details

1)	Paper Title	**Introduction to PCB**	
2)	Paper No	I	
3)	Objectives of Paper	1. To make aware of basics of PCB	
4)	Expected out comes from Paper	• On completion of the paper, the students will be able to know: The basics of PCB Circuit Design and Fabrication, student will learn with Proteus CAD a tool widely used in the industry.	
5)	**Content**		
	Unit-1	**Basics of PCBs:** Need, Classification, Electronics components and their categories (discrete, ICs, \SMDs) – symbols, dimensions, packages, Connectors and cables. Types of PCBs, PCB Materials. Rules for Track and Study of IPC standards.	20 Hour
	Unit-2	**Basics of printed circuit board designing:** Layout planning, general rules and parameters, ground conductor considerations, thermal issues and PCB Designing Flow chart, The Schematic, Keywords & their description, Imperial and Metric, Working to Grids, Working from the top, Tracks, Pads, Vias, Polygons and Clearances.	25 Hour
6)	Reference Book	1) Printed Circuit Boards: Design and Technology by Walter Bosshart.	

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1)	Paper Title	**PCB Layers & Design Rules**	
2)	Paper No	II	
3)	Objectives of Paper	1. To make students aware of layers of PCB	
4)	Expected out comes from Paper	• Identify dimensions of electronic and mechanical components for PCB layout & layers of PCB	
5)	**Content**		
	Unite-1	**PCB Layers:** Silkscreen, Solder Mask Mechanical Layer, Keep out, Layer Alignment, Net-lists, Rats Nest, Design Rule Checking, Forward and Back Annotation, Power Planes, Good Grounding, Good Bypassing, High Frequency Design Techniques, Component Placement & routing	20 Hour
	Unite-2	**Design:** Component packages, Basic Routing, Auto Routing. Finishing Touches. Single Sided and Design Double Sided Design. Introduction to GERBER FILE and its Generation. PCB fabrication techniques.	25 Hour
6)	Reference Book	1) Printed Circuit Boards: Design, Fabrication, and Assembly by R. Khandpur.	

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1)	Paper Title	**PCB design of Analog circuit & Digital circuit**	
2)	Paper No	III	
3)	Objectives of Paper	1. To make student aware of electronic design	
4)	Expected out comes from Paper	• Hands-on experience of working with PCB Design. • Acquire skills to do better Minor/Major Projects.	
5)	**Content**		
	Unite-1	**Analog Circuit Design: -** Power supply design using LM317/7805/7905, Transistor amplifier, Transistor and relay driver, Op-Amp as Integrator/Differentiator, Op-Amp as Comparator (IR module/LDR), DC-DC Converter, AM/FM Transmitter / Receiver PCB, Instrumentation Amplifier Using Three Op-Amp/AD 620.	45 Hour
	Unite-2	**Digital circuit Design: -** Logic-Gate 74XX , De-morgans law, MUX/DEMUX , Flip-Flop circuits, Shift register, Counter circuits, BCD to 7-Segment Decoder, Multivibrator (A stable / Monostable), Schmitt trigger, IC 555 based circuits, 8051 Development Board.	45 Hour
6)	Reference Book	1. PCB DESIGN & LAYOUT FOR DIY ETCHING: A PROJECT-BASED TUTORIAL by A. B. Lawal 2. https://www.labcenter.com/resources.	

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