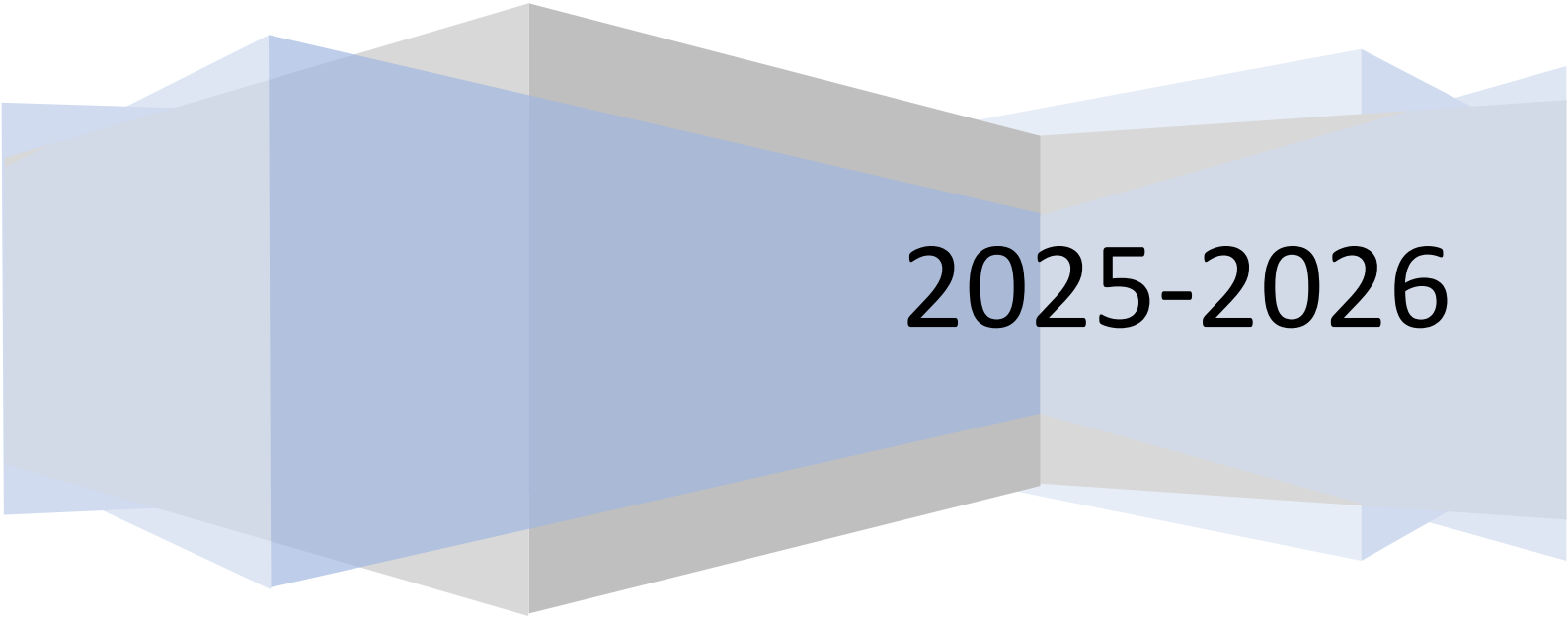


SWARNA INSTITUTE OF TECHNOLOGY

PCB DESIGN COURSE

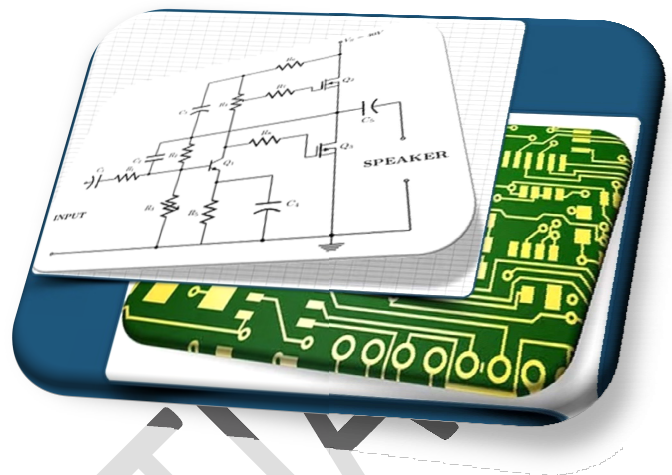
BY PRADEEP RAJ



2025-2026

WHO WE ARE?

SWARNA INSTITUTE OF TECHNOLOGY, established in 2016, is providing the courses to the desired candidates. We provide the training on PCB layout design, Signal integrity and Power integrity. We promise that we will provide the best training classes to our students. Our main objective is to take the candidate's skill set to professional level.



CONTACT US

Contact Person: Pradeep Raj

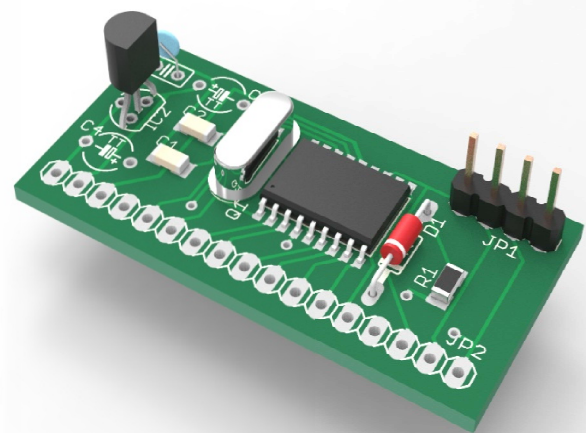
Phone: +91 90199 90775

Email: pradeip002@gmail.com

Web: <https://pradeip009.wixsite.com/pcb-design/pcb-design>

PCB DESIGN COURSE

PCB Design & Electronics circuit are basements for all type of electronics products. We provide industry level training, where they meet the industry standards. The PCB design course duration will be from one month to three months. We have fast track course for PCB design that will be completed within the two months. During the training period, enough assignments will be provided and will also train multilayered PCB layout design.



OUR APPROACH

Electronics – The Base



If you are looking for job in core electronics, then you need to have very strong knowledge over the basic concepts, theories, calculations, laws of Electronics.

Practical Approach



Concepts will be understood only if you have experience over practicals. Modules created to understand concepts, every candidate will spend time on practicals.

Expertise – The Skills



If you are looking for job in core electronics, then you need to have very strong knowledge over the basic concepts, theories, calculations, laws of Electronics.

COURSE FLOW

PHASE 1 – SCHEMATIC DESIGN

- Symbol Library Creation
- Schematic Preparation
- Electrical Rule Checking
- Bill of Material (BOM)

PHASE 2 – FOOTPRINTS DESIGN

- Surface Mount Device (SMD) Packages.
- Plated Through Hole (PTH) Packages.
- Ball Grid Array (BGA) Packages.
- All Interface Connector Packages.

PHASE 3 – BOARD DESIGN

- Board Shape Creation.
- Layer Stack Up Preparation.
- Constraint Manager Settings.
- Placements.
- Routing.
- VIAs Creation & Application.
- Multi-Layer Design Support.
- Plane Creation & Understanding.
- Artwork or Gerber Generation.



COURSE MODULES

NOTE: Online Classes Only

Program 1: PCB Design Course for Beginners

Level : Beginners Level (2-Layer Design)
Duration : 30 Days (+5 Task Days)
Time : 1.5 Hours to 2 Hours per Day
Projects : 10 Task Projects

Program 2: Advance PCB Design Course (Program 1 included)

Level : Advanced Level (up to 6-Layer Design)
Duration : 45 Days (+10 Task Days)
Time : 1.5 Hours to 2 Hours per Day
Projects : 12 Task Projects

Program 3: High Speed PCB Design Course

Level : Professional Level
Duration : 25 to 30 Days
Time : 1.5 Hours to 2 Hours per Day
Projects : 2 Task Projects

Program 4: Signal Integrity & Power Integrity Course

Level : Professional Level
Duration : 20 to 25 Days
Time : 1 Hours to 1.5 Hours per Day
Projects : Based on Requirement.

COURSE SYLLABUS

Program 1: PCB Design Course for Beginners

Level	:	Beginners Level (2-Layer Design)
Duration	:	30 Days (1.5 Hours to 2 Hours per Day) (+5 Task Days)
Projects	:	10 Task Projects
Tools	:	Cadence: OrCAD/Allegro or Eagle CAD (Any one)

Learnings:

- All types of IEEE standard symbol creation (Around 100+ symbol creation).
- Schematic preparation.
- BOM preparation for all projects.
- Datasheet collection & understanding component dimensions.
- Footprint creation (Around 150-to-200 footprint creation).
- Switching process from schematic to Board.
- Constraint manager setup for Physical, Electrical & Spacing.
- Board design of 2-Layer with low, moderate and high-density boards.
- Component Placement, Routing & Plane creation.
- Gerber Generation.

Program 2: Advance PCB Design Course (Program 1 included)

Level	:	Advanced Level (2-Layer Design)
Duration	:	45 Days (1.5 Hours to 2 Hours per Day) (+10 Task Days)
Projects	:	12 Task Projects
Tools	:	Cadence: OrCAD/Allegro or Eagle CAD (Any one)

Learnings:

- All types of IEEE standard symbol creation (Around 100+ symbol creation).
- Schematic preparation.
- BOM preparation for all projects.
- Datasheet collection & understanding component dimensions.
- Footprint creation (Around 150-to-200 footprint creation).
- Switching process from schematic to Board.
- Layer Stackup: Setup & understanding of multilayer stackup.
- Constraint manager setup for Physical, Electrical & Spacing.
- Board design of 2-Layer, 4-Layer and 6-Layer PCBs.
- Component Placement, VIA creation, Multilayer Routing & Plane creation.
- Gerber Generation.

Program 3: High Speed PCB Design Course

Level	:	Professional Level
Duration	:	25 to 30 Days (1.5 Hours to 2 Hours per Day)
Projects	:	2 Task Projects
Tools	:	Cadence: OrCAD/Allegro

Learnings:

- Schematic understanding and analysis.
- Understanding & building multilayer stackup.
- Constraint setting for High speed designs.
- Understanding multilayer routing.
- High speed design routing & practice.
- VIAs: Blind, Buried & Micro VIA understanding.
- Routing topologies & Transmission line fundamentals.
- Understanding cross talk & reflections.
- Termination strategy.
- Differential signalling.

Tool Practice:

- Hierarchical design blocks.
- Constraint manager Settings.
- **DDR3** and **DDR3 Memory** interface design guidelines and practice.
- **SATA** design guidelines and practice.
- **PCIe** design guidelines and practice.
- **HDMI** design guidelines and practice.
- **USB** design guidelines and practice.
- **ETHERNET** interface design guidelines and practice.
- **UART** interface design guidelines and practice.
- Other High Frequency design practice.

Program 4: Signal Integrity and Power Integrity Course

Level	:	Professional Level
Duration	:	20 to 25 Days (1 Hours to 1.5 Hours per Day)
Projects	:	Based on Requirement.
Tools	:	HyperLynx

Learnings:

Signal Integrity (SI):

- Importance of SI in high-speed PCB design.
- Layer stackup & role of dielectric materials.
- Transmission line behavior – Microstrip vs Stripline.
- Reflections & termination methods.
- Crosstalk analysis – NEXT & FEXT.
- Pre-simulation vs Post-simulation approaches.
- IBIS models – importing and using in simulation.
- Differential pairs & SerDes (skew, balance, impedance).
- Via modeling and its effects on SI.
- S-Parameter simulations – Insertion loss & Return loss.
- Eye diagram analysis & timing margins.
- High-speed interface case studies: DDR, PCIe, USB.

Power Integrity (PI):

- Importance of PI in reliable high-speed systems.
- Power Delivery Network (PDN) design concepts.
- Decoupling analysis & capacitor optimization.
- IR Drop analysis – DC power distribution issues.
- Current density plots – hotspots & reliability concerns.