



## TRAINING

- Expert Training in the Latest Technologies
- Industry-Demanded Certifications

## PCB TECHNOLOGY

### Quality & Inspection

- IPC-A-610 Instructor & Operator Certification

### Soldering & Assembly

- IPC J-STD-001 Instructor & Operator Certification

### Bare Board Inspection

- IPC-A-600 Instructor & Operator Certification
- IPC-6012 Instructor & Operator Certification

### Rework & Repair

- IPC-7711 & IPC-7721 Instructor & Operator Certification

### Hand Soldering Skills

- Soldering Basics, Wires & Terminals, Lap Solder Joints, Through-Hole and Surface Mount Training

### PCB Fundamentals

- Component Identification
- Electrostatic Discharge

### PCB Design

- Essentials of PCB Design
- IPC Designer Certification

## COUNTERFEIT COMPONENTS

### IDEA-STD-1010

- Seminars & Workshops
- IDEA-STD-1010 Essentials
- SAE AS5553 Counterfeit Electronics

## CABLE & WIRE

## HARNESS TECHNOLOGY

### Quality & Inspection

- IPC-A-620 Instructor & Operator Certification

### Hands-On Labs

- Crimping & Harness Assembly Training

## TECHNICAL SUPPORT

- Manufacturing Start-Up
- Process Evaluation
- Subcontractor Qualification
- Equipment Evaluation
- Lead-Free, ESD, Process and Quality Audits

## IPC ADVANCED DESIGNER CERTIFICATION (CID+)

IPC's Interconnect Designer Certification

IPC-2221 / IPC-2222 / IPC-T-50

## COURSE DESCRIPTION

Continuing the educational series for PCB Design, the IPC Advanced Designer Certification or (CID+) is for Certified CID's looking to continue and expand their educational understanding of board design and production problem solving started from their successful completion of the IPC Designer Certification or CID.

This 4-day, lectured course (3-days lecture, 1-day review and testing), delves into design and fabrication issues that go beyond the fundamentals of layout, component placement and routing consideration to understanding fabrication materials, testing of not only electrical, but physical aspects of boards, electrical and signaling issues, complex component mounting strategies and requirements, and fabrication considerations for high end designs and circuitry.

The program continues the utilization of IPC-2221 "Generic Standard on Printed Board Design" and IPC-2222 "Sectional Design Standard for Rigid Organic Printed Boards", reviewing in more detail the parameters and requirements within these standards to gain a better appreciation between board design and doing so in such a way that the designer manages problematic issues that can occur in the production environment.

Taught by recognized industry professionals, this program enhances your experience by exposing you to IPC Certified Instructors who possess a broad expertise and appreciation for the process. This course is open to anyone who has completed the IPC Designer Certification CID.

*Class materials are sent out upon enrollment. Participants are expected to be familiar with course materials prior to class.*

## WHO SHOULD ATTEND

This course would benefit anyone involved in the development, design and fabrication—at any level from sales, management, procurement, or quality—in printed circuit board production, however it is primarily taken for the advancement of the designer.

## PREREQUISITES

- Understanding of the English language, oral and written

## CLASS SIZE

Maximum number of students is limited to ten (10) in order to provide greater instructor interaction. Call early to reserve your space.

## COURSE OUTLINE

### DAY 1

#### DESIGN CONSIDERATIONS

- Board Material Properties
- Plating Characteristics for Conductors and Holes
- Surface Finish and Treatment Characteristics
- Solder Mask/Coating Material Properties and Compatibility
- Homogeneous Material Performance Capability
- Statistical Process Control (SPC) with Test Coupons
- Reliability and Stress Test Evaluations
- Quality Life Cycle Tracking
- Materials and Compliance
- Solder Joint Reliability

#### PRINTED BOARD CHARACTERISTICS

- Design Standards to meet Fabrication and Assembly Goals
- Manufacturing Equipment Size Limitations
- Printed Board Length to Width Relationships
- Balanced Construction and Copper Balance
- Printed Board Thermal Management Techniques
- Controlled Expansion Constructions Using Special Cores
- Non-Standard Mechanical Outline (Case) Integration
- Individual Board Tooling Considerations
- HDI - Interconnect Vias Types and Strategies

### DAY 2

#### ELECTRICAL PARAMETERS

- Physical Board Dielectric Parameters
- Shielding Techniques to Prevent Signal Emission
- EMI and EMC Emissions/Susceptibility
- General Principles of Impedance Control
- Signal Integrity Analysis
- Electrical Clearance and Dielectric Spacing
- Power and Ground Routing Techniques
- Conductor Current Carrying Capacity vs. Temperature Rise
- Layout Approaches for Crosstalk Minimization

### DAY 3

#### COMPONENT AND ASSEMBLY ISSUES

- Component Comparison Between Area and Peripherals Arrays
- Component Types and Mounting Strategies
- Component Placement Strategy and Assembly Sequence
- Component Mounting Shock and Vibration Requirements
- Evaluation of Component Attachment Methods

#### DOCUMENTATION AND DIMENSIONING

- Parts List Development - BOM (Bill of Materials)
- Printed Board Tolerance Analysis
- Document to Facilitate Design to Fabrication Interface
- Printed Board & Assembly Data Format Standardization
- Assembly, Repair & Modification Tools and Techniques

### DAY 4

#### Q & A

#### CERTIFICATION TESTING

**REGISTRATION** For up to date pricing and more information on any of the EPTAC programs, or to enroll, please call us toll free or visit eptac.com.

**Toll Free:** 1-800-64-EPTAC  
**email:** register@eptac.com  
**Web:** eptac.com

**ON-SITE TRAINING** Please call a training consultant and ask about customized course content, on-site training and training around your production schedules.