EMERALD GLOBAL AUTOMATION INDIA

Embedded Systems Design

Learn Innovation with impact

# PCB DESIGNING

AN ISO 9001 : 2015 CERTIFIED COMPANY

## IAO - INTERNATIONAL ACCREDITATION ORGANIZATION
## ISA - INTERNATIONAL SOCIETY OF AUTOMATION

**Do you have the thirst to work in CORE INDUSTRIES?**
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**/ PRODUCTION / AUTOMOBILE / MARINE ETC)**
**We Offer the Pathway & Opportunities**

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**Address : Unit No 21, 3rd Floor, Modern Towers, West Cott Road, Royapettah, Chennai – 14.**

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*INNOVATION & TECHNOLOGY*

"Embedded Systems Programming is Demand of Future"

# PCB DESIGNING

- PROTEUS
- OrCAD
- EAGLE
- ALTIUM
- FRITZING

## INDIAN GOVERNMENT

## AUTHORIZED TRAINING COMPANY

### AN ISO 9001 : 2015 CERTIFIED COMPANY

Logon to www.egai.in for more details
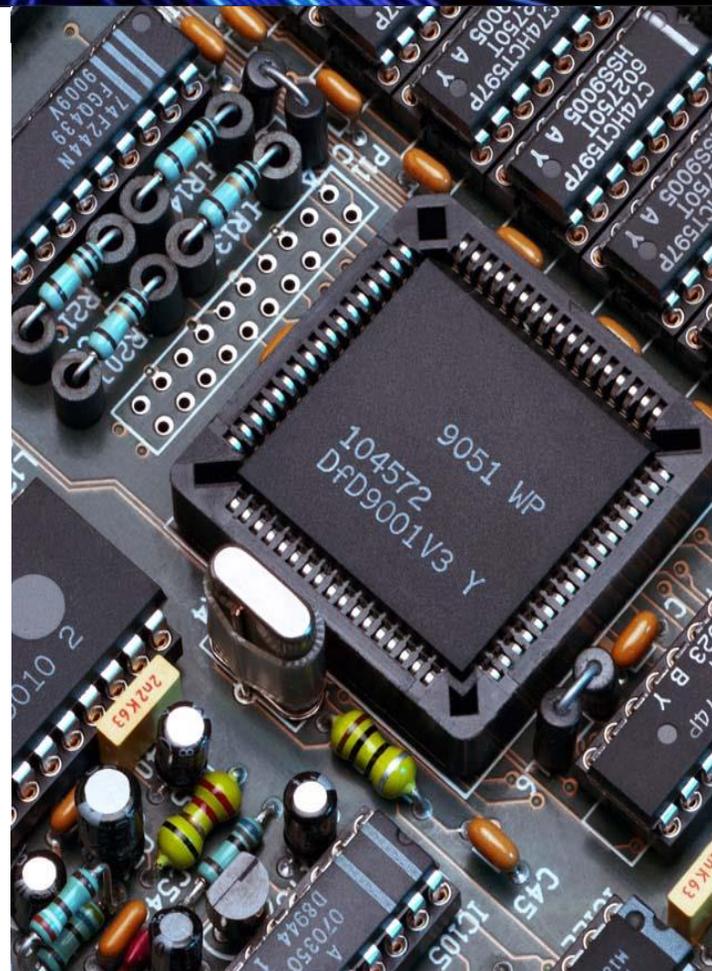
## GET TRAINED

## BY EGAI PROFESSIONALS

ADVANCED HARDWARE & SOFTWARE DESIGNING

- Creating a New Project
- User Interface & Navigation in the work area
- Edit the Tittle Block
- Select and Place components from Proteus Library
- Components with Simulator Model
- Set Keyboard Shortcuts
- Manage Components
- Schematic Design
- Schematic Circuit
- Create a New Schematic Library
- Creating the Connector
- Creating the Resistors
- Creating the Potentiometer
- Creating the 555 Timer
- Connecting the Schematic
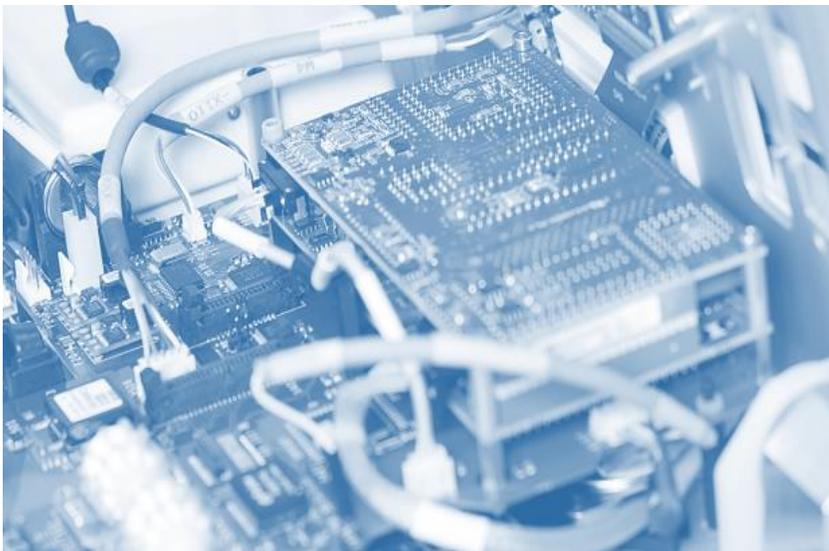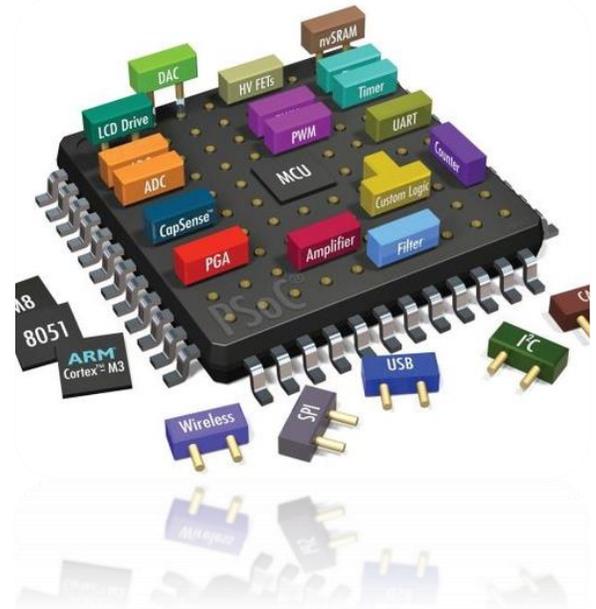
- PCB Layout
- Switching from Schematic to PCB Layout
- Basic PCB Layout Terminology
- Create a Footprint Library
- Creating the Resistors Footprints
- Creating the Potentiometer Footprint
- Creating the Diode Led Footprint
- Creating the Connector Footprint
- Creating the 555 Timer Footprint
- Placing the Footprints
- Creating the PCB Border
- Design Rule Managers
- Autorouting
- Manual Routing - Tracks
- Manual Routing - Vias

- **Teardrop**
- **Power Plane Generator**
- **Adding Text and Logo**
- **3D Visualization**
- **3D Navigation**
- **Adding 3D Components**

# PROTEUS

EGAI has a team of expertised professionals in the field of Embedded Designing and Hardware Programming.

**EGAI's**

**Robotic Training**

- **Setting the 3D PCB**
- **Where to find 3D components**
- **Output Files**
- **Exporting PDF Schematic**
- **Exporting PDF Layers**
- **Generate Gerber Files**

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# OrCAD

- **Introduction to OrCAD Lite**

- **How to install OrCAD Lite**

- **Project #1: Fast Simple LED Circuit**
- LED: Creating and simulating a schematic in Capture CIS Lite
- LED: Associating Schematic Footprints and Setting PCB Parameters
- LED: Placing Components and Routing the PCB
- LED: Generating Gerber and Drill Files and Online Check
- LED: LED Recap and Finished
- Why OrCAD/Allegro for PCB Design?
- Overview of OrCAD Capture CIS Lite
- Projects in Capture and the Design Hierarchy
- Capture CIS Part Libraries

- Placing Parts in Capture CIS
- Wiring a Schematic in Capture CIS
- Capture CIS Customization and Preferences
- Capture CIS Annotations, Text and Smart PDF
- Overview of Padstack Editor
- Through-Hole Padstacks and the editing environment
- Creating a surface mount device (SMD) padstack
- Overview of PCB Editor Lite
- Environment Setup and Grid Spacing
- Add Lines, Shapes and Text
- Constraints Manager and Vias
- Create Your First Footprint from Scratch
- Create a Footprint using Package Symbol Wizard
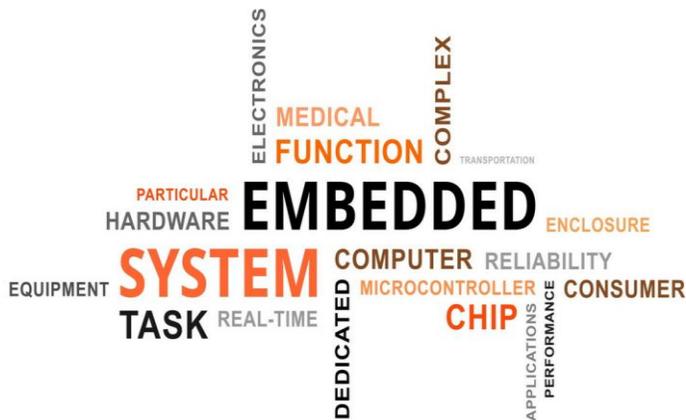
- **Project #2 Part 1: The AstableMultivibrator 1.0 Schematic**
- Overview of the AstableMultivibrator
- AMV1.0 Drawing the Schematic in Capture CIS
- AMV1.0 Simulating in PSPICE
- AMV1.0 Cleaning up the schematic
- AMV1.0 PCB Environment Setup

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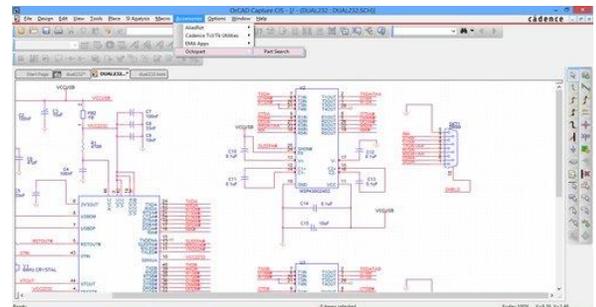
- **Project #2 Part 2: AstableMultivibrator Footprints**
- AMV1.0 Batch Padstack Creation
- AMV1.0 Through-Hole Capacitor Footprint
- AMV1.0 Footprint for Test Points TP1, TP2
- AMV1.0 Footprint for J1
- AMV1.0 Footprint for Connecters J2, J3
- AMV1.0 Footprint for LED D1, D2
- AMV1.0 Footprint for Transistor Q2
- AMV1.0 Modifying LED Footprint
- AMV1.0 Footprint for Resistors R1, R4
- AMV1.0 Footprint for Surface Mount Transistor Q1
- AMV1.0 Footprint for Surface Mount Resistors R2, R3
- AMV1.0 Footprint for Surface Mount Capacitor C1
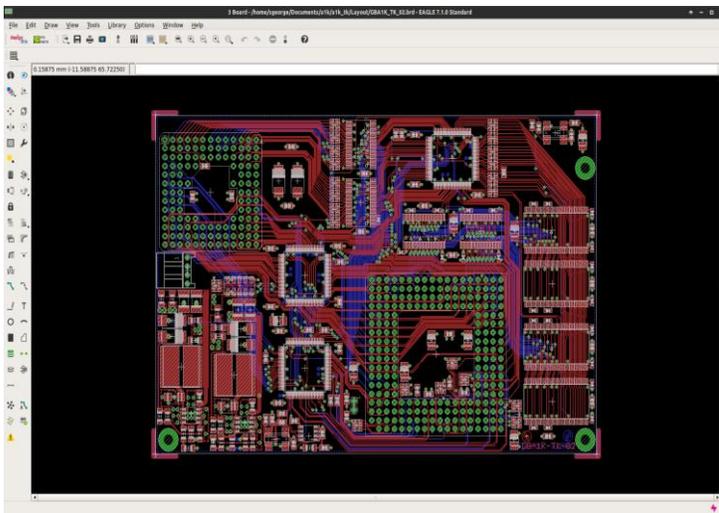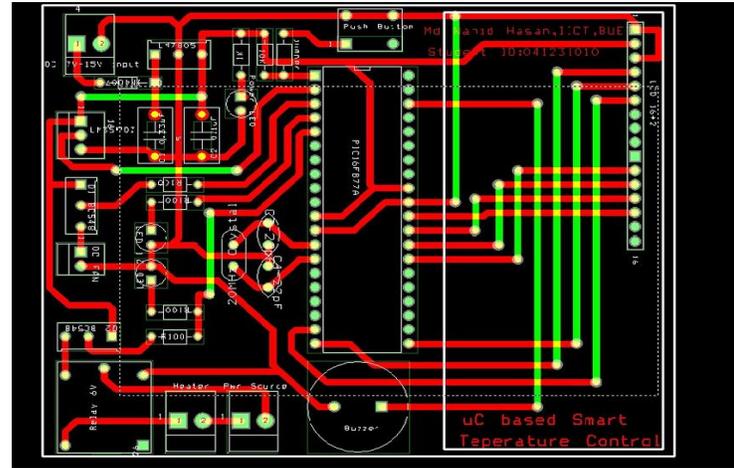




- **Project #2 Part 3 - AstableMultivibrator 1.0 PCB**
- AMV1.0 Netlist & Color Views
- AMV1.0 Constraint Manager and Last Color View
- AMV1.0 Placing Parts (Part 1)
- AMV1.0 PCB Part Placement (Part 2)
- AMV1.0 PCB Editing Padstacks
- AMV1.0 Routing (Part 1)
- AMV1.0 Routing (Part 2)
- AMV1.0 Generate Silkscreen Text
- AMV1.0 Export Gerber and Drill Files
- AMV1.0 Submitting Gerber files for Manufacture
- AMV1.0 Documentation

- **Project #3 - AstableMultivibrator Version 2**
- Intro to AMV 2.0
- AMV2.0 Schematic
- AMV2.0 Simulation
- AMV2.0 Design for Manufacture
- AMV2.0 First Footprint (IC chip)
- AMV2.0 Creating All Footprints
- AMV2.0 Setting Paths, Netlist and Fixing Footprint Errors
- AMV2.0 Placing Components
- AMV2.0 Constraints and Routing the PCB
- AMV2.0 Generating Silkscreen
- AMV2.0 Generating Gerber Files
- AMV2.0 3D Model & STEP files
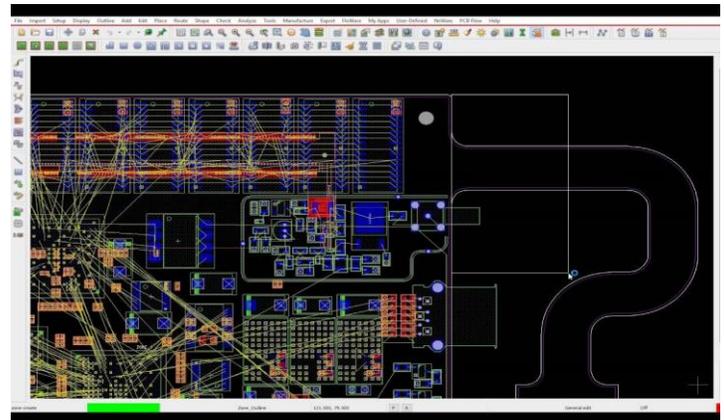
- **Introduction.**
    - Download & setup Eagle.
- **Introduction To control Panel in Eagle.**
- **Create your own project**.
    - Create project and add schematic to your project.
    - Delete an existing project.
    - Understand the difference between active and non active project.
- **Start your first project on Eagle(Audio Amplifier LM386 PCB).**
    - How to transfer your idea to real design and find reference to your project.
- **Place components to schematic editor.**
- **Connect the components on schematic editor.**
    - Use wire tool and connect the components in the right way.
    - Using junction tool and how to use it correctly.
- **Electrical check rule for your schematic design.**
- **Transfer the schematic to Layout editor and arrange PCB board.**
    - How to transfer schematic to PCB board and how to set the board dimensions, and arrange the components on the board.
- **Route PCB components.**
    - Route components together and how to set the track width and choose the layer we want to use it.
- **Add Polygon, design check rule(DRC),and finishing PCB design.**
    - How to add Polygon to your board and why polygon is a useful tool.
    - Check design rule (DCR) to detect if there is any error in our design.
    - Finish our design and how to add text and measure dimensions of the board and components.
- **More useful Layout editor tools.**
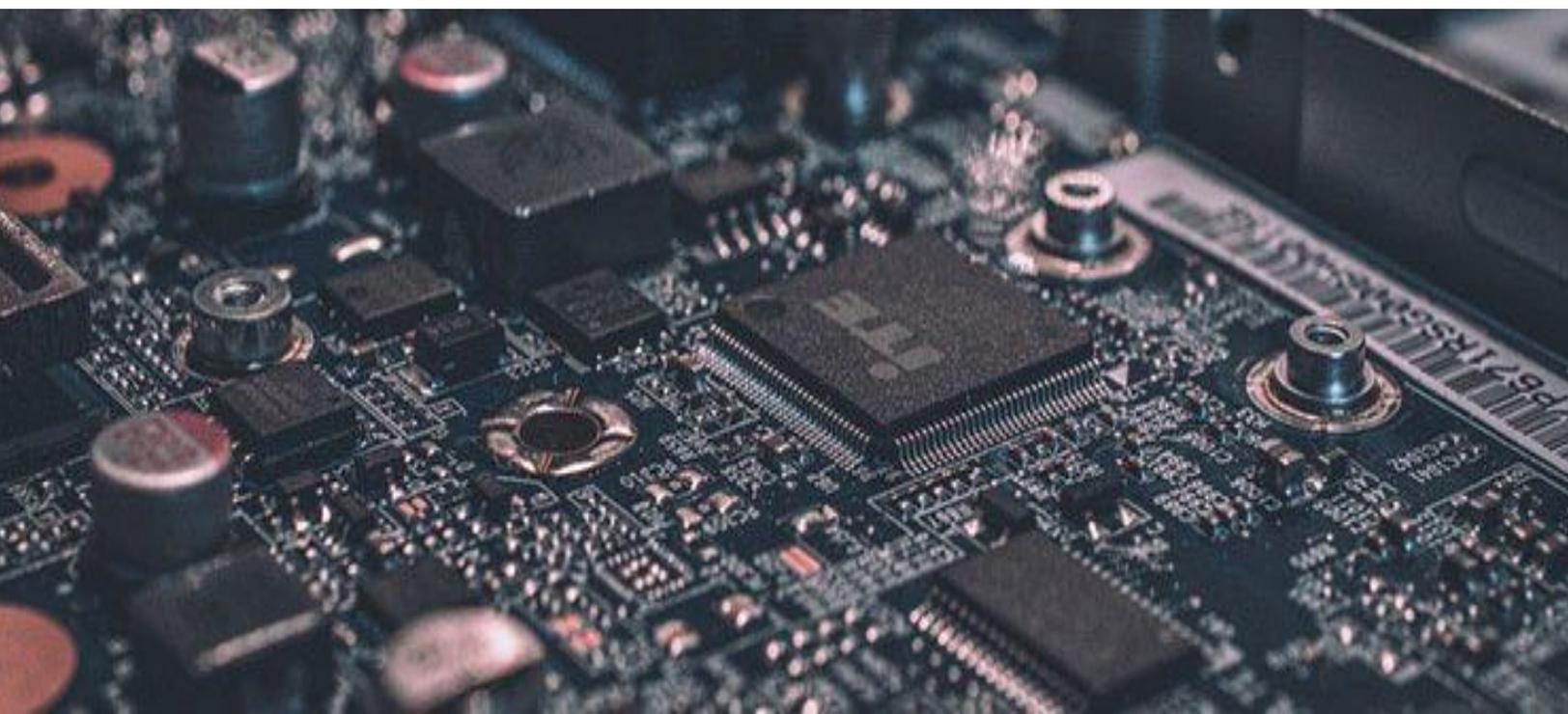
- **Second project MAX7219 Seven segment driver, Improve your skills**.
  - Introduction and first look to Datasheet.
  - Create the project and place the schematic components.
  - Connect the schematic components using Bus line and Label Method.
- **Run Electrical rule check ERC for the schematic**.
- **Arrange the PCB components on Layout editor.**
- **Routing the PCB part 1, learn how to route two Layers board.**
- **Routing the PCB part 2, learn how to use via on your board.**
- **Add polygon to your board and run the design rule check DRC.**
- **Finishing the PCB and add text to the board.**
  - Board designing, edit the board text using SMASH tool and add some texts to the design.
- **Third project - Design TPS61097 Step up circuit.**
- **Analyze the project and first look to the datasheet**
  - STEP UP circuit which is used in many smart phones and electronics devices.
- **Create the project and place the schematic components.**
  - Create the project and create the schematic and place all components.
- **Connect the schematic components.**
  - Connect the components together in schematic editor.
- **Arrange the PCB components.**
  - Move to layout and arrange all the components on our PCB.
- **Routing the PCB components and add Polygons.**
  - Routing the PCB component.
  - Add Polygon to your design.
- **Finishing the PCB board design and add text to the board.**
- **How to create a custom library and design a custom part on Eagle.**
  - Select the component and first look to the Datasheet.
  - Draw the symbol for the component.
  - Draw the footprint and finish the library.



Embedded Systems
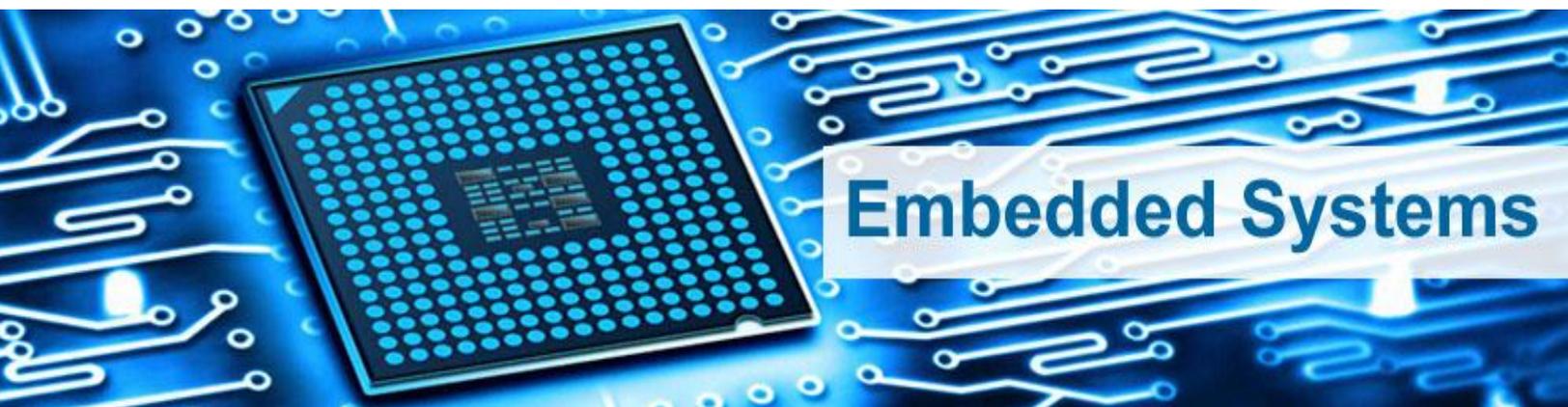
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- **Introduction**

- **How to Download and Install Altium Circuit Maker**

- **Schematic Design**
- **Adding Components to Schematic Design**
- **Wiring the Schematic Diagram in CircuitMaker**
- **Assigning Designators, Compiling Project and Cleaning up Schematic Design**
- **Printed Circuit Board Design**
- **Importing Components and Defining Board Shape**
- **Placing Components on the Arduino Nanite**
- **Design Rule Check and Multilayer PCB Components**
- **Design Rule Checking**
- **Optimizing Component Placement in Altium CircuitMaker**
- **Routing and Auto Routing Tiny Arduino in Circuit Maker**
- **Design Rule Check After Routing PCB**
- **PCB Design**
- **Generating Manufacturing Output Files**
- **Generating the Gerber and NC Drill Files**
- **Generate the Bill of Materials**
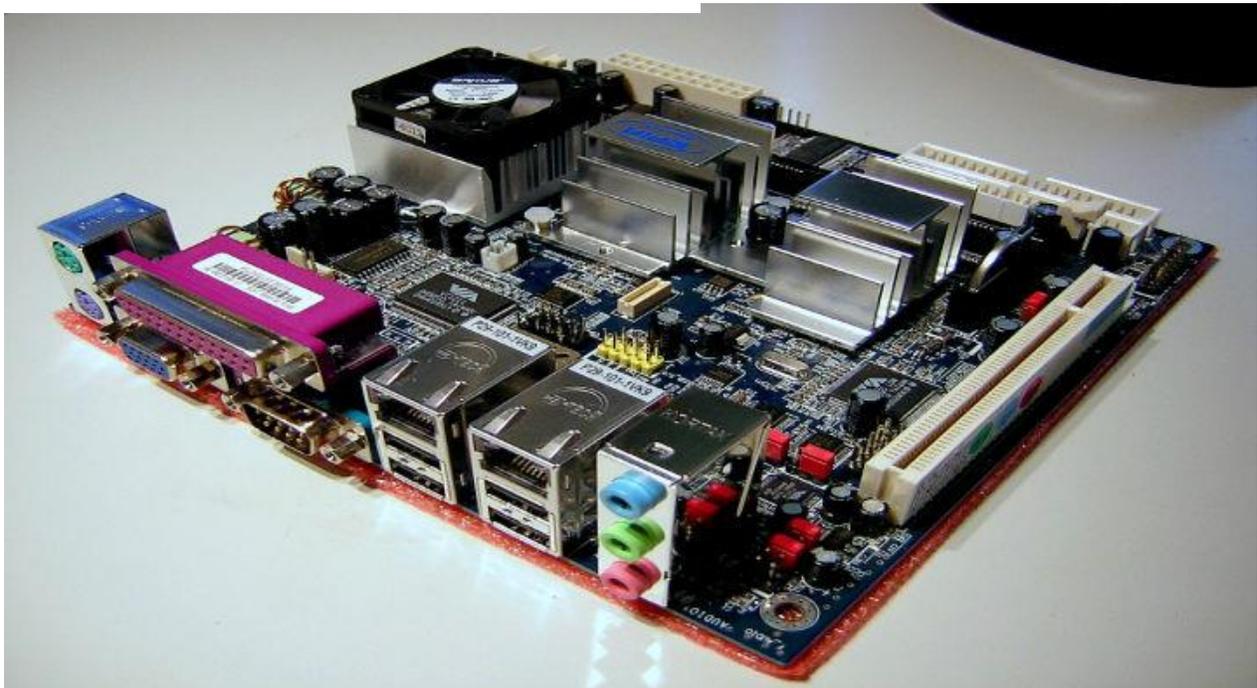
# TRAINING PROGRAMS IN PCB DESIGN & EMBEDDED SYSTEMS

- **CERTIFIED PCB DESIGN ENGINEER (CPDE)**
  - **Duration : 30 Days**
  - **Fees : 25,000/-**

- **ADVANCED DIPLOMA IN PCB DESIGN (ADPD)**
  - **Duration : 60 Days**
  - **Fees : 40,000/-**

- **POST GRADUATE DIPLOMA IN PCB DESIGN (PGDPD)**
  - **Duration : 90 Days**
  - **Fees : 50,000/-**

- **MASTERS IN PCB DESIGN (MPD)**
  - **Duration : 120 Days**
  - **Fees : 70,000/-**

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- **CERTIFIED EMBEDDED ENGINEER (CEE)**
  - **Duration : 30 Days**
  - **Fees : 25,000/-**

- **ADVANCED DIPLOMA IN EMBEDDED SYSTEM (ADES)**
  - **Duration : 60 Days**
  - **Fees : 40,000/-**

- **POST GRADUATE DIPLOMA IN EMBEDDED SYSTEM (PGDES)**
  - **Duration : 90 Days**
  - **Fees : 50,000/-**

- **ADVANCED POST GRADUATE DIPLOMA IN EMBEDDED SYSTEM (APGDES)**
  - **Duration : 120 Days**
  - **Fees : 70,000/-**

## KEY POINTS….. WHY EGAI ?

- SPECIAL OFFERS FOR ON THE SPOT REGISTRATION
- SPECIAL GROUP DISCOUNTS
- 100% PLACEMENT ASSURANCE
- SPECIAL **EMBEDDED & PCB DESIGN** COMBINED PACKAGES AVAILABLE
- SPECIAL DISCOUNT & CUSTOMIZED PACKAGES FOR EDUCATIONAL INSTITUTES
- SPECIAL TRAINING PACKAGES & CUSTOMIZATION FOR CORPORATE SECTORS
- INTERNATIONAL CERTIFICATIONS & GLOBALLY VALID CERTIFICATIONS
- WE HAVE A TEAM OF SPECIALIZED INDUSTRIAL PROFESSIONALS WHO INDIVIDUALLY FOCUS AND PROVIDE HANDS – ON – EXPERIENCE IN ALL THE TOPICS