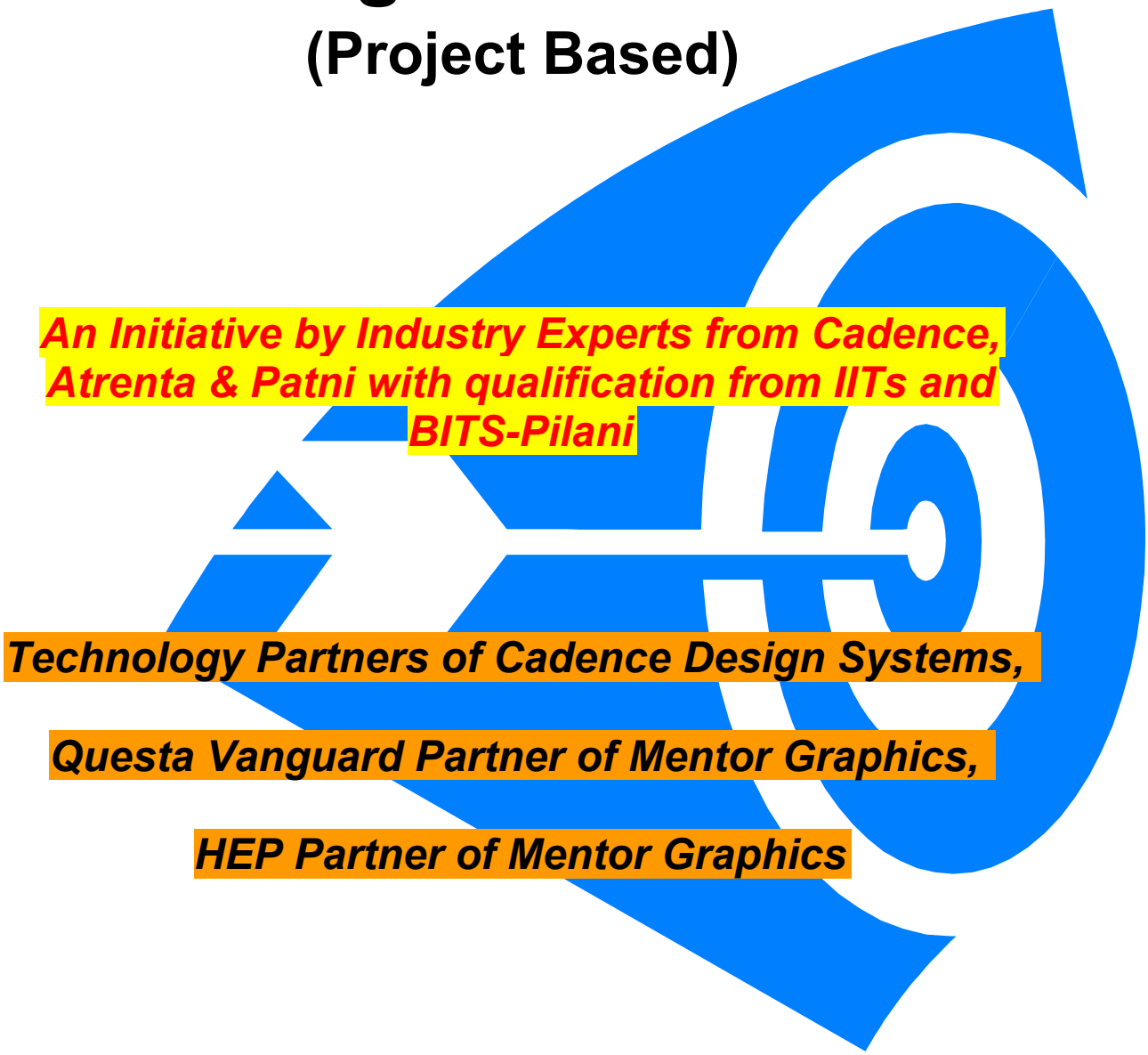
Industrial Training

in

Embedded, Internet Of Things & Android

(Project Based)

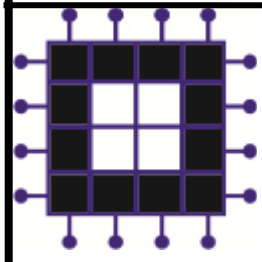


An Initiative by Industry Experts from Cadence, Atrenta & Patni with qualification from IITs and BITS-Pilani

Technology Partners of Cadence Design Systems,

Questa Vanguard Partner of Mentor Graphics,

HEP Partner of Mentor Graphics



DKOP Labs Pvt. Ltd.

Knowledge, Operations and Practices

A-82, Ground Floor, Sector – 57, Noida – 201301
Tel: 0120-4274237; Mob: +91-9780280410, +91-9910101496, +91-9971792797
Email: info@dkoplabs.com; Web: http://www.dkoplabs.com

PROGRAMS

There are different programs available in Industrial Training in Embedded Systems Development. Students can choose the programs they are inclined to pursue.

1.	Industrial Training Embedded Hardware & IOT with AVR & Arduino ***Modules (1, 2, 5, 6, 7, 8, 9 & 18)***	15,000/-
2.	Industrial Training Embedded Hardware & IOT with ARM, AVR & Arduino ***Modules (1, 2, 5, 6, 7, 8, 9, 12 & 18)***	25,000/-
3.	Industrial Training Embedded Hardware, IOT with ARM, AVR, Arduino & Embedded Android ***Modules(1 to 9, 12 & 16 to 18)***	35,000/-
4.	Industrial Training Embedded Hardware, IOT with ARM, AVR, Arduino & Device Drivers ***Modules(1 to 15 & 18)***	35,000/-

* **Service tax as applicable**

Batches Commence in : Jan, Feb, July & Sept every year

Total Seats : 30 per batch (max)

Duration : 4 hrs/day, 5 days/week for 5 months

Payment Terms:

- Rs 5000 + service tax for registration
- Balance fee needs to be deposited at the time of joining
- Payment can be done by DD/Cheque in favor of **"DKOP Labs Pvt Ltd"** payable at Noida or can be transferred through NEFT using internet banking. Account details for internet banking will be provided on request.

MODULE TOPICS

MODULE 1: EMBEDDED SYSTEM OVERVIEW

1. **Introduction**
2. **History of Embedded System**
3. **Embedded System Design Parameters (GAS)**
4. **Challenges and Trends in Embedded System**
5. **Operating Systems for Embedded System**
6. **Difference between Microprocessor & Microcontroller**
7. **RISC & CISC**
8. **Introduction to PIC/AVR/ARM/Raspberry Pi/Arduino/8051**

MODULE 2: BASIC ELECTRONICS WITH SIMULATION

1. **Practical applications of Basic Components (RLC)**
2. **Number Representation and Conversions**
3. **Design Concepts**
4. **Introduction to Logic**
5. **Optimized Implementation of Logic Functions**
6. **Arithmetic Circuits**
7. **Combinational-Circuits Building Blocks**
8. **Flip-Flops, Registers, Counters, and Simple Processor**
9. **Synchronous Sequential Circuits**
10. **Asynchronous Sequential Circuits**
11. **Digital System Design**

MODULE 3: OPERATING SYSTEM - LINUX

1. **Introduction to LINUX**
2. **Managing Files & Directories**
3. **Basic SHELL structure**
4. **Files System, Process Management System**

MODULE 4: SHELL SCRIPTING

1. **Automating Tasks using Shell Scripts**
2. **Using Conditional Execution in Shell Scripts**
3. **Managing Repetitive Tasks Using Shell Scripts**

MODULE 5: ARDUINO MICROCONTROLLER INTERFACING AND PROGRAMMING

1. **Introduction: Microcontrollers and Microprocessors**
2. **Arduino Architecture**
3. **Memory Organization (in comparison with CPU)**
4. **Programming in Assembly and C**
5. **Hands on Compilers**
6. **Special Function Registers**
7. **Addressing Modes**
8. **Instruction Set**
9. **Interfacing & Implementation**
    1. **LED, Keypad, 7-Segment, LCD interfacing**
    2. **Various types of Sensors**
    3. **DC geared motors**
    4. **Stepper motor**
    5. **Motor Driver (H-Bridge)**
    6. **Basic Op-amp Circuits (Comparators)**
    7. **Designing line detecting sensors**
    8. **Timers and Counters**
    9. **Interrupt Handling**
    10. **Serial Communication**

MODULE 6: AVR/PIC MICROCONTROLLER INTERFACING AND PROGRAMMING

1. **AVR/PIC Architecture**

2. **Memory Organization (in comparison with CPU)**
3. **Programming in Assembly and C**
4. **Hands on Compilers**
5. **Special Function Registers**
6. **Addressing Modes**
7. **Instruction Set**
8. **Interfacing & Implementation**
    1. **LED, Keypad, 7-Segment, LCD interfacing**
    2. **Various types of Sensors**
    3. **DC geared motors**
    4. **Stepper motor**
    5. **Motor Driver (H-Bridge)**
    6. **Basic Op-amp Circuits (Comparators)**
    7. **Designing line detecting sensors**
    8. **Timers and Counters**
    9. **Interrupt Handling**
    10. **Serial Communication**

MODULE 7: BASIC 'C', EMBEDDED 'C' & DATA STRUCTURES

1. **Embedded Difference**
2. **Functions & Tasks**
3. **Pointers & Data Structures**
4. **Combining 'C' & Assembly**
5. **C Preprocessors for Embedded**

MODULE 8: INTERNET OF THINGS

1. **Introduction to IoT**
2. **Introduction to Cloud**
3. **Interfacing of various Internet modules**
4. **ESP8266, ESP8266 12E and Ethernet Module Interfacing**
5. **Interfacing Device and sharing data to Cloud**
6. **Various IoT protocols**
7. **Implementation of IoT protocols (MQTT)**
8. **Implementation of IoT Framework (aREST)**
9. **Implementation of IoT Broker (Mosquito on Raspberry – only if raspberry module is opted)**

MODULE 9: INTRODUCTION TO PCB DESIGNING

1. **Circuit Simulation**
2. **Schematic Designing**
3. **Net Listing**
4. **Auto routing**
5. **Multi-layer PCB Designing**
6. **Layout Designing**
7. **Hands on some PCB designs**

MODULE 10: LINUX INTERNALS

1. **Memory Management System**
2. **OS Services and Kernel Architecture**
3. **Inter process communication methods**
4. **IPC in Linux**
5. **Programming and debugging using Linux**

6. **Threads and its implementation**

MODULE 11: DEVICE DRIVERS

1. **Hardware Basics and low level programming**
2. **Introduction to C Cross compilers**
3. **Introduction to device drivers**
4. **Interrupt handling and interrupt protocols**
5. **SCULL, BLUETOOTH, USB drivers and network drivers**

MODULE 12: ARM CORTEX M4F AND ARM 7 COMPLETE

1. **Introduction**
2. **History of arm**
3. **Genesis of ARM in comparison with other risc processors**
4. **Processor modes**
5. **Designing the first arm1**
6. **Improving on arm**
7. **The arm in the market**
8. **Arm design objectives**
9. **RISC machine**
10. **Introduction to ARM7**
11. **Arm cortex M4F**
12. **Arm programming model**
13. **Memory Organization**
14. **Hands on Compilers**
15. **Addressing Modes**
16. **ARM exceptions**
17. **Thumb instruction set overview**
18. **Arm C/C++ compiler details**
19. **Arm processor application**
20. **LED, Keypad, 7-Segment, LCD interfacing**
21. **Timers, Serial port**
22. **Serial peripheral interface**
23. **I2C protocol and interfacing**

MODULE 13: RTOS

1. **Overview of RTOS**
2. **Gantt chart**
3. **IPC of RTOS VS DEVICE DRIVERS**
4. **Tasks**
5. **Priority handling of tasks**
6. **multitasking and interrupts in task**
7. **Introduction to IPC of RTOS**
8. **Pipes and Named pipes**
9. **Shared Memory**
10. **Message Queue and Mail Boxes**
11. **Semaphores and Lock**
12. **Sockets, Threads and its implementation**
13. **Scheduling in RTOS**
14. **Memory allocation**

MODULE 14: PYTHON

1. **Basics of Python**
2. **Functions & Tasks**
3. **Data Structures & Algorithms**
4. **List and Tuples**

MODULE 15: RASPBERRY PI

1. **Overview of RASPBERRY PI**
2. **Booting OS into SD card (RASPIAN,PINDORA,UBUNTU)**
3. **LED, LCD , Keyboard interfacing**
4. **Servers and Types of Servers**
5. **Game Server**
6. **Introduction to cloud and build own private cloud**
7. **IPC using RASPBERRY PI**
8. **Interfacing Raspberry and Arduino**

MODULE 16: CORE JAVA

1. **JAVA Introduction**
2. **Data Types, Operators, Selection Constructs**
3. **Arrays & Vectors**
4. **Classes & Objects**
5. **Graphics Programming using Swings**
6. **Event Handling**

MODULE 17: ANDROID APP DEVELOPMENT

1. **Architecture of Android OS**
2. **Android Layouts & Controls**
3. **Android UI & Components**
4. **Android Graphics & Multimedia**
5. **Persistence in Android using SD Cards**
6. **SQLite Database**

MODULE 18: PROJECTS

Students will be implementing all their concepts which they built in the above MODULES to make out a MAJOR PROJECT which will add a great value to this training program.

TOOLS

Our labs are equipped with State-of-the-art Mentor Graphics EDA Tools, Windows/Linux based Open-Source EDA tools and demo versions of some industry tools.

- PCB Design & Simulation Tools
- Arduino, AVR & Keil Compiler
- ARM Development Kit

BENEFITS FOR YOU

1. Helps you in understanding the **practical** and **industrial applications** of academic curriculum
2. Build your knowledge to develop **innovative projects** during your **final year** of engineering
3. Enhances the Skill-Set in your resume for **better placement prospects** within the **semiconductor industry**
4. Helps the aspirants of **higher studies abroad** to face the stiff competition from students of other countries
5. Build your confidence through **hands on exposure** to various **tools & technologies**

TEAM OF TRAINERS

DKOP Labs is proud to have highly qualified and experienced professionals from Industry, Research and Academics. For details, click here.

PLACEMENTS

We have been providing excellent placement platform to our trainees in companies like Cadence, Xilinx, ST Microelectronics, Samsung, Synopsys, Mentor Graphics, SmartPlay, TrueChip, Agnisys, DKOP Labs, etc. For detailed list, click here.