

ADVANCED EMBEDDED SYSTEMS DESIGN COURSE (Learning by Doing)

Goal: Become an Industry-ready Hands-on Embedded Engineer, by completing all the related Course-ware and Projects. Skill yourself with most advanced embedded systems training.

Target audience: Engineering in ECE, EEE, Mech.E, CSE, IT / MSc / MCA / Professionals looking to upscale your Career

Duration:

All modules, put together,

- 5 Months (Day Scholars)
- 13 Weekends (Working Professionals)

Customized one-to-one group project-wise mentoring with online support as per the chosen schedule of the total duration.

Learning environment:

Practical approach: 70% of the time you will be doing hands-on programming

Best-in class mentors: With real-time industry experience

Project oriented approach: Work on real-time industry standard projects, enough to land into your First Job

Online Learning Management System, Get access to enough artifacts to achieve your objective:

Videos, Audios and Text – Go through the Expert Classroom sessions repeatedly

Online Practice Tests

Practice Exercises and Assignments

Module based Projects to give you a wide exposure of embedded systems to enhance your Resume

Courseware / Materials:

Plenty of quality resources, in sync with industry needs

Live hardware: Embedded programming in real hardware

Soft-skills and Interview Preparation:

Learning by Doing workshops: Resume Preparation, Facing interviews to building career – How to?

Industry seminar: Interact with senior professionals, learn what industry wants

SYLLABUS:

- Module 1:
 - Advanced / Embedded C programming
 - Data Structures and Logic Analysis
- Module 2: Micro-controllers (8051 and PIC)
- Module 3: Embedded programming on complex ARM9

Prerequisites: Basic C programming knowledge

Platforms: [BeagleBone Black](#)

MODULE I

Module Name: Advanced C language

Duration: 4 weeks

Objectives:

- Clearly understand concepts of C language
- To obtain good quality and style in programming
- Gear you up for programming in embedded environment

Most importantly, to induce confidence in you! By introducing exceptional programming skills!!

Overview: Lot of books tells about what programming is. Many also tell how to write a program, but very few cover the critical aspect of translating logic into a program. Specifically, in this fast paced industry, when you don't have time to think to program, this course comes really handy.

It builds on the basics of programming, smooth sailing through the advanced nitty-gritty of the Advanced C language by translating logic to code. Every class is backed by discussion and topic related assignments. Finally a project letting you apply most of the concepts learned throughout following modules.

- Delivery method: Instructor lead, Specific assignments and Mini Project

Topics covered

- Basics of C - Operators, Conditionals, Arrays, Pointers
 - Structures, Unions, Functions, Files, Preprocessor directives, Recursion
 - Project environment - Creating & Building a project, Makefiles
 - Deep dive - Logic to program translation, Creating your own library, Dry-run
 - Introduction to Data Structures
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MODULE 2

Module name: Micro controllers

Objectives:

- Enable you to read and understand data-sheets and hardware manuals.
- Setup, develop and download Embedded applications into a target hardware.
- To provide a basic idea of hardware/electronics aspects of programming
- Enable you to program any micro controller.
- To get you started with basic Embedded application development with ease

Overview: A complete module deals with writing an Embedded C program for Hardware with any microcontroller on it. This module gives you first-hand experience of running your program on target hardware, thereby giving you the “Embedded” feel.

With custom designed self-learning kit boards (based on 8051 / AVR / PIC) you will learn how to write optimized Embedded programs.

Duration: 4 – 6 weeks

Platform: Self Learning Kits (based on 8051 / PIC / AVR micro-controllers)

Delivery method: Instructor led, Assignments and Mini Project

Topics covered

- Introduction to embedded systems
 - Microprocessors vs. Microcontrollers with intense hardware focus
 - Hands-on working with GPIOs, Analog I/Os, Memory usage, interfacing etc.
 - Micro controller peripherals usage - Timers, Counters, Interrupts and its sources
 - Communication protocols - UART, SPI, I2C etc
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MODULE 3

Module name: Embedded Bare Metal Programming on ARM 9

Objectives:

- Get you exposed with various trends in Embedded OS
- Making appropriate Open source choices for your Embedded device
- Get hands-on with Flash memory usage, EEPROMS using development boards.
- Equip you with high end application Embedded development with ARM 9

Overview: An unique module combining various previous modules you have learnt by combing OS administration, Hardware knowledge, OS, C/Computer programming areas. This is a complete module on Embedded OS, as of now no books are written on this with such practical aspects.

Every class is backed by discussion and topic related assignments, demo by instructor and practice by you.

Finally a project letting you apply most of the concepts learned throughout the module

Duration: 4 – 6 weeks class and lab

Platform: BEAGLE BONE BLACK ARM development board Windows.

Delivery method: Instructor lead, Assignments and mini project

Topics covered

- BARE METAL ecosystem
 - Making choices for Embedded OS
 - Evolution of high end Embedded Systems
 - Host and Target concepts • U-boot, cross compiling, porting
 - file system on the board, debugging methods, Real-time OS.
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