

iMobile Computing Technology

Incubated by Science and Technology Park, University of Pune, DST. www.imct.in

Linux base Embedded Mobile Computing Technology

Course: Linux base Embedded Mobile Computing Technology

Duration: 3 days (5-7hrs/day)

Dates: -

Time: -

Eligibility: BE/BTech/ME/MTech (CSE / E&TC / Electronics)

Objectives:

- Learn about Key principles of Linux base Embedded OS
- Learn how to build a handheld/mobile embedded system, Simputer
- Learn how to develop applications on mobile handheld devices
- Learn about open source Micro-controller tools

Results:

- Expected results – a working – handheld embedded system with advanced applications

Skills developed:

- Mobile application Development
- Designing a Linux base embedded system
- Open Source Software Skills



Training Details



Background

- Introduction To Embedded System
- Introduction To Open Source S/W
- Importance of Linux base Mobile handheld Computing Technology and Development

Linux Operating System Fundamentals

- Linux OS Design Flow
- Process and Threads
- Signal Handling
- Interrupt Management
- Memory Management
- File System and Implementation
- System Call Interface
- Inter Process Communication
- I/O Subsystem
- Network And Security

Introduction to ARM-GCC Cross Compilation Tool chain and Environment

- ARM-GCC Cross Compiler
- Linker
- Loader
- Makefile

LAB- Installation of ARM-GCC Cross Compilation Tool chain

Introduction To Mobile Handheld Device Platform, Simputer

- Simputer Overview
- Simputer OS Design
- File system in Simputer
- Programming On Simputer
- Communication between Simputer and host machine

LAB- Compile and Run programs on Simputer mobile device

LAB- Minicom Configuration for communication between Simputer and host machine

Introduction To PXA Microcontroller (Advanced ARM Processor) in Simputer

- Architecture of PXA255 Microcontroller
- GPIO pin Configuration in PXA255

Introduction To Graphical User Interface, GTK for mobile devices

- GNOME Development Tool Kit (GTK) Libraries and Utilities
- GTK Programming

LAB- Develop GTK Applications for Simputer mobile device

Introduction To Smartcard Operating System

- Smartcard Overview
- Smartcard OS Fundamentals
- Smartcard Libraries and Functions
- Smartcard programming

LAB- Develop Smartcard reader and writer application for mobile device, Simputer

Configuration and Compilation Of Linux Kernel for Simputer mobile device

- Configuration Of Linux OS
- Compilation Of Linux OS
- Study Linux Kernel Makefile

LAB- Install Kernel Cross Compilation Tool chain and compile the kernel for Simputer

Implementation Of Device Driver and modules for Simputer mobile device

- Device Driver Development
- Kernel Module Development

LAB- How to write, compile and run device driver



LAB- How to write and add modules in kernel space

References and Guideline for Linux base Embedded System

Advantages of training:

1. Open Source Linux is a very popular OS among all industries so there is strong demand for Linux expertise from industries all over the world. (Linux- Need Of Today's market)
2. As it is very necessary for all engineers to have knowledge about open source environment, iMCT will insist students and professionals to work on open source S/W (Linux) and compilation tools and utilities.
3. This will be common training activity for all having CSE and electronics background. It will be added advantage for their curriculum and they could get good opportunities to work with best organizations. Though this activity will be added advantage, it is not out of syllabus and scope for students also.
4. CSE people can develop software applications for advanced microcontrollers whereas ETC people can implement more hardware specific software in the training program.
5. iMCT is the 1st organization who is delivering such training programs based on industry projects and not available in the educational system till the date in such a low cost solutions.

Prerequisite:

-  Machines installed with Linux OS Red Hat 9.0 or Fedora 4 onwards for students
-  Simputer Educational Boards (If not then inform iMCT in advance for Simputer Lab set up)

NOTE:

- ✚ The training will be conducted by iMCT's expertise and delivered to only college students, staff and industry people.
- ✚ Time for training can be extended if required.
- ✚ Training will be conducted in the premises of collage/University, it is expected that college will provide required logistics like classroom, lab room with all prerequisite like computer, software, LCD projector.
- ✚ If students want to take training in iMCT/STP premises need to intimate 15 days before the training schedule.
- ✚ *We have other courses RTOS with ARM 7, Linux programming, Advance topics like Verilog HDL for IC design and Verification, Open Source Verification Technology for IC design Please contact us for more details on support@imct.in and sales@imct.in*



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