

iMobile Computing Technology

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

Introduction to Linux Operating System and Programming

Course: Linux Operating System Introduction and Programming

Duration: 3days (5hrs/day)

Dates: -

Time: -

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

Objectives:

- Learn about Key principles of Linux OS
- Learn Linux OS programming

Results:

- Expected results –Introduction to Linux OS

Who can participate in the training module?

- Third year or final year Students from CSE/IT/Electronics background can do this training.

What you will archive out of this?

- It will be added advantage for students in their curriculum and they could get good opportunities in the best organizations to work with.
- Though this activity will be added advantage, it is not out of syllabus and scope for students.
- Students will get enough idea to decide domain to work in future.
- Biggest plus point of this activity is students are going to save time and money to learn about latest technology and he/she could take decision in early phase of life.
- 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.
- In some cases iMCT will help in setting up lab and this will help students to do experiments in house rather than going out for some institute to learn same.
- Training will be given by iMCT's highly experience engineering resource.

DAY-1

1. Role Of Operating system

- What is Operating system?
- Objective Of OS
- Types of Operating systems

2. Introduction To Linux Operating System

- What is Linux OS?
- History
- Open source Linux
- Linux Place in Market
- Linux Distributions

3. Linux installation with LAB

- Pre-requisite for Linux installation
- How to install Linux

LAB: Install Linux on native machine.

4. Linux OS Architecture

- Linux Features
- Linux Kernel Source Directory Structure
- Linux Kernel Components
- User Mode Vs Kernel Mode
- System Initialization – Booting Process

5. Linux important commands and utilities

- Study file handling Commands
- Basic user commands
- System management commands
- Network Management Commands
- Command redirections and pipelines

LAB: Exercise important commands

LAB: Mounting and unmounting FS

LAB: How to create Symbolic Links?

6. Introduction to Linux tools, compilers and utilities

- GCC Compilation process
- Study VI editor
- Introduction To Makefile

LAB: Compile and run C language programs on Linux

LAB: How to write Makefile to compile programs on Linux

7. Shell scripting in Linux

- Why scripting languages.
- Available scripting languages
- Bash Shell Programming
- Variables
- Control Constructs
- Functions

LAB: How to write and execute shell scripts?

LAB: Shell Script Examples

DAY-2

Detail study of Linux OS components

8. Process Management

- What is Process?
- Process Control Block (PCB)
- Types Of Processes
- States Of Process
- How to Create Process?
- Process Scheduling

LAB: How To create and terminate processes?

9. Thread Management

- What is Thread?
- Thread Control Block (TCB)
- User level Vs Kernel level Threads
- How to create and cancel threads?
- Thread Scheduling
- Process Vs Threads

LAB: How to create and cancel threads?

LAB: How to control Multithreading?

10. Interrupt Management

- What are interrupts?
- Types Of Interrupt
- Interrupt Handling
- Interrupt Service Routine (ISR)
- Interrupt Latency

11. Signal handling

- What are signals in Linux OS?
- Signal Implementation
- Signal Handling

LAB: How to send and catch signals?

LAB: How to handle signals?

<p>DAY-2</p> <p>12. System call interface</p> <ul style="list-style-type: none"> • Introduction To System Call Mechanism • Significance Of System Calls <p>13. Memory Management</p> <ul style="list-style-type: none"> • Memory Management in Linux • Swapping • Paging • Virtual Memory Management (VM) • Demand Paging • Static and Dynamic Linking <p>14. File System</p> <ul style="list-style-type: none"> • Need Of File System (FS) • Internal Representation Of Files • Virtual File System • Linux File System- ext2fs and proc 	<p>DAY-3</p> <p>15. Inter-Process communication (IPCs)</p> <ul style="list-style-type: none"> • Introduction To Inter-process communication mechanism • Pipes, Message Queue and Shared Memory • Semaphores and Mutex • Socket Programming on Linux <p>LAB: How to send and receive data using pipes and message queues</p> <p>LAB: How to share data using shared memory mechanism?</p> <p>LAB: How to use Semaphores to share resources?</p> <p>LAB: Socket Implementation</p> <p>16. Device driver</p> <ul style="list-style-type: none"> • Devices and Device Driver (DD) • Types Of DD • Registration Of DD • Linux Kernel Modules • Linux Kernel Compilation <p>LAB: How to write kernel module?</p> <p>LAB: How to add device driver in kernel?</p> <p>LAB : Linux kernel compilation</p>
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Training Schedule

Prerequisite:

- Machines should have IDE hard disk having separate free partition of 20GB for Linux installation.
- Basic understanding of OS, 8085 base hardware systems.

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.
- ✚ *We have other courses RTOS with ARM 7, Mobile Computing Technology and mini OS, 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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