

## 'Linux Device Drivers LIVE Workshop'

**Special Focus: Live hands-on with Character and USB "Device" Drivers**

**Next Workshop commencement dates:** Kindly check website / Contact directly

**Duration:** 8 sessions of 3 hours each over 4 weekends

**Course Fee:** Rs. 9000 /- Per Person

**Venue:** Emertxe Information Technologies Pvt. Ltd.  
#1, 5th Main, 9th Cross, Jayamahal Extension,  
Bangalore 560046. (Behind Jayamahal Bus Stop)

### Workshop Session Topics:

Session 1: Introduction & The First Driver  
Session 2 & 3: Character Drivers  
Session 4 & 5: USB Drivers  
Session 6 & 7: Block Drivers & File System Module  
Session 8: PCI Drivers & Wrap Up

### Workshop Pre-requisites:

- Good C & Programming Skills
- Basic Hands-On Linux Usage
- Understanding of Files, Filesystems, Kernel & User Space
- Hands-On with gcc & its friends
- Understanding of make & Makefiles

### Workshop Highlights:

- Platform: x86-based
- Kernel: Version 2.6.x
- Drivers: For Real Hardware
- Special Focus: Live hands-on with Character and USB "Device" Drivers

### Detailed Course Contents:

- Linux Driver Ecosystem
- The Kernel 2.6 Source Organization
- Driver Development Environment
- Character Drivers
  - Major & Minor Numbers
  - Registering & Unregistering
  - Device Files & Device Classes
  - File Operations & its related Kernel Data Structures

- Special Focus on open, release, read, write, ioctl
- Memory Access in Kernel Space
- Hardware Access Mechanisms
  - System Memory
  - Device Memory
  - I/O Ports
- Kernel & Driver Debugging Options & Techniques
- Ways to Deal with Concurrency
- Time Keeping, Delays, and the Timers in Kernel
- USB Drivers
  - USB Device Layout
  - USB Driver Layout
  - USB Core & Sysfs
  - USB Driver Registration
  - USB Device Hot-plug-ability
  - URB & its Operations
  - Special Focus on Control & Bulk Transfers
- Interrupts
  - IRQs & their Registration
  - IRQ Handling & Control
  - Soft IRQs
  - Top & Bottom Halves
- Block Drivers
  - Driver Registration
  - Disk Drive Registration
  - Block Device Operations & its related Kernel DS
  - Request Queues & their Processing
- File System Modules
  - Virtual File System (VFS) Interfaces
  - VFS Internals
  - File System Registration & Operations
  - Super Block Operations
  - Inode Operations
  - Address Space Operations
  - File Operations
- PCI Driver
  - PCI Interface
  - PCI Configuration Space

- PCI Driver Registration
- PCI Device Access & Operations

## Detailed Hands-On Content:

- The Driver specific Commands & Tools
- Setting up the Driver Development Environment
  - Understanding Kernel's Build System
  - Writing your Makefile
- Writing your “first” Driver
- Writing various Character Drivers
  - Null Driver
  - Memory Based Driver
  - UART (Hardware) Based Driver
- Understanding the USB Ecosystem
  - Walk through of Procs & Sysfs in relation of USB
  - Understanding the USB Device entries
  - Interfacing with the USB Core
- Writing a USB Driver
  - USB Driver & Device Registration
  - Hot-plug-ability: probe and disconnect
  - Bulk Transfers & Various System Calls
  - USB to Serial Device (Hardware) Driver
- Writing a File System Module (FSM)
  - Memory Based File's Data & Meta Data in our FSM
  - Mounting over a Pseudo Device
  - Interfacing with the VFS
    - Filling the Super Block
    - Creating the Directory Entry & Inode
    - Performing the operations: ls, cd, stat, sync, ...
- Pseudo File System Driver

## Payment Options:

### 1) Online

Account Name: **Emertxe Information Technologies (P) Ltd**

Account No : **10378321544**

Name of Bank : **State Bank of India**

Branch : **Jayamahal Extension**

**2) On Spot**

Cash / Any Major Credit / Debit Cards

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