

Linux System Programming & Linux Device Drivers

Prerequisites

- Good C programming skills
- Good knowledge of computer/microprocessor/microcontroller architecture
- Operating Systems theoretical knowledge
- Excellent analytical skills and problem solving skills

Modules to be covered

1. Linux File System

Command-line interface
Directory Structure & Contents
Basic Shell utilities /commands
Directory / File Operations
System/Process/Disk Status Indicators
Getting Help: man, info pages
On-Line Manuals

2. Revision of C + Advanced C

Foundations of C programming - Revision
Types, declarations and expressions
Control Flow, Functions and program structure
Arrays, pointers, structures, unions – nested structures, pointers to structures, arrays of pointers, double pointers
Data structure design
Input and output handling, File handling
Introduction to Linux GNU Compiler Collection (gcc)
Dynamic Memory Management – malloc, calloc, free
Linked Lists – singly linked list, queues, stacks
Command-line argument handling
Program Design

3. Linux systems programming using C

Files and streams

Process management

Signals, Timers

POSIX Threads

Advanced programming topics (recursion, function pointers, file processing)

C compilers

Makefile basics

4. Linux Device Drivers Development (for x86 processors)

Intro to devices and drivers

Understanding and building Linux Kernel modules

Char drivers

Time constraints

Linux device model

Interrupt handling

Debugging techniques

Introduction to block and network drivers

USB drivers