

# Linux, Networking and Device Drivers

(Datacom/Communications Network and Systems Software Developer)

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## Course Overview

This course is intended for anyone (intermediate/beginner/student/working-professional) to gain good hands-on knowledge on a Linux Systems Software development platform which includes both user-space and kernel-space along with core Network Software Development. So that you comfortably work on domains such as:

- Datacom domain - core routing and switching (R&S)
- Network Protocols
- Networking Stack
- CGE Appliances (Career Grade Equipment)
- Network Appliances

## Duration

50 - Sessions (~2 hours a session) - Lectures and Practical

Approximate duration: 4 months

## Prerequisites

- You should have good prior C programming skills (intermediate/expert level) and hands-on such as:
  - Algorithms and programming
  - Structured programming
  - Knowledge/hands-on Data-structures, APIs, etc.

## Topics Covered

### Linux User-Space:

- Linux C programming advanced topics
- GCC compiler
- multi-threaded user-space apps
- Linux Daemons

- Process/Thread architecture and scalability
- Process/Thread synchronization
- Socket programming and Network software programming
- Memory Structure
- Research

### Kernel-Space:

- Linux Kernel basics and internals
- Kernel architecture
- Kernel subsystems:
  - Platform, Networking, Memory management, Process, File-systems, etc.
- Kernel modules
- Kernel data-structures
- Kernel customization, compilation
- Kernel<>User-space interaction
- Kernel /proc file system
- Kernel programming
- Kernel ioctl() interface
- Device Drivers
- Memory Management and Allocation
- Character Devices
- Kernel Features
- Transferring Between User and Kernel Space
- Interrupts and Exceptions
- Timing Measurements
- Kernel Timers
- Research

### Networking:

- Networking Fundamentals
- IPv4 Addressing, Linux Kernel IPv4 Network stack
- Protocol architecture
- L2 bridging (switching), L3 routing fundamentals, deeper concepts and research
- MPLS/VPLS L2 tunnels
- VPN L3 tunnels
- Routing protocols
- Networking Appliances architecture: Router, Firewall, etc
- CCNA course topics:
  - such as IPv4 subnetting, VLAN, NAT, broadcast/collision domains, etc.
- Building a small home networking lab
- Architecture of Carrier Grade Network Equipment (or appliance)
- Research

## Course Delivery

### **Students living abroad:**

We can have teaching sessions via Google hangouts/Skype, etc (audio/video/chat sessions).

You can pay your fee via Paypal and enroll for the classes/course.

**Course Fee: \* kindly refer the website Courses Tab.**

### **Students living in India:**

We can have teaching sessions via Google hangouts/Skype, etc (audio/video/chat sessions).

You can pay your fee directly to my bank account and enroll for the classes/course.

**Course Fee: \* kindly refer the website Courses Tab.**

For more details kindly contact me via email: [kiran.kankipati@gmail.com](mailto:kiran.kankipati@gmail.com)

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