

TOC : Embedded Systems Training basics and Operating system virtualization.

Duration: 24 hrs

Day 1:

1. Introduction to Embedded Systems

Definition and Applications

Embedded Systems vs. General-Purpose Systems

Components of Embedded Systems

2. Microcontroller Basics

Overview of Microcontrollers and Microprocessors

3. Operating Systems Training

Introduction to Operating Systems

Purpose and Functions of an Operating System

Types of Operating Systems (Batch, Multitasking, Real-Time, etc.)

OS Kernel and System Components

Day 2:

4. File Systems and Storage Management

File System Concepts and Structures

File Access Methods and Directory Structures

Disk Scheduling and Management

RAID and Other Data Storage Techniques

Lab: Disk scheduling, RAID, Storage techniques

5. Device Management

I/O Systems and Device Drivers

Device Management Techniques

Communication between OS and Devices

Lab: Installation of device driver

6. Security and Protection

Security Policies and Mechanisms

User Authentication and Access Control

Data Encryption and OS Hardening Techniques

Lab: User access control & User Authentication and Access Control

Day 3:

7. Operating Systems in Practice

Overview of Popular Operating Systems (Linux, Windows, macOS)

Linux Internals and System Programming

Lab: Linux administration basic commands , Windows/ Mac OS basic administration, Linux Kernel customization via make minicontig , Virtualization using Hyper V

Day 4

8. Virtualization and Cloud OS

9. Basics of Virtualization

Types of Virtual Machines (System vs. Process VMs)

Lab: Virtualization compute, network, storage using Hyper V, Cluster implantation using windows, Docker and Kubernetes implementation basic.

Day 5

10. OS-Level Virtualization and Containers (Docker, Kubernetes)