Linux Operating System and Applications

Course Introduction

Why This Course?

- Linux is a foundational platform for modern computing: servers, cloud, DevOps, cybersecurity, and embedded systems.
  - **Servers:** Most web servers, database servers, and enterprise applications run on Linux due to its stability, performance, and scalability. Popular hosting platforms (e.g., AWS EC2, Google Cloud, Azure) often use Linux-based instances.
  - **Cloud Computing:** Linux is the backbone of cloud platforms. Cloud-native tools like Kubernetes, Docker, and OpenStack are designed to run on Linux. It's the default OS for containers and virtual machines in cloud environments.
  - **DevOps:** DevOps workflows rely heavily on automation, CI/CD pipelines, configuration management tools (like Ansible, Puppet, Chef), and container orchestration — all of which are Linux-centric or optimized for Linux environments.
  - **Cybersecurity:**
    Security professionals use Linux for penetration testing, monitoring, and incident response. Tools like Kali Linux, Wireshark, and Snort are Linux-based.
  - **Embedded Systems:**
    Linux runs on everything from routers and smart TVs to IoT devices and automotive systems because it's lightweight, customizable, and open source.

Why This Course?

- High demand for Linux skills in IT infrastructure and software engineering roles.
  - **IT Infrastructure:**
    Roles like system administrators, cloud engineers, and network engineers require Linux skills to manage servers, virtual machines, and cloud deployments.
  - **Software Engineering:**
    Developers often build, test, and deploy applications in Linux environments, especially in backend, mobile, and embedded domains.
  - **Career Advantage:**
    Employers value candidates with practical Linux experience. Knowing Linux often sets applicants apart and leads to roles with more responsibility and higher pay.

What You'll Learn

- Core concepts of the Linux OS (installation, CLI, scripting)
- System administration tasks (users, permissions, packages)

  Network service configuration (DNS, DHCP, SSH, Web, FTP, Mail, etc.)
- Automation with shell scripting and exposure to DevOps tools
- Real-world applications in cloud and system operations

Assessments

- Homeworks (30%)
- Seminar (20%)
- Exams
  - Mid-term (10%)
  - Final-term (40%)
- Bonus (5%)
  - Seminar