

LINUX PROGRAMMING & ADMINISTRATION

Post-Graduate Certificate Program

UC SANTA CRUZ SILICON VALLEY CAMPUS
UCSC Silicon Valley
Extension

in partnership with  Higher Education

Linux is the operating system (OS) of choice for today's servers, network infrastructure, embedded systems and mobile devices. UCSC Extension's certificate program in Linux Programming and Administration consists of two fields of study. Our program offers training at all levels, from basic installation and tools to network administration, programming drivers for devices, developing applications or services, and kernel customization for advanced systems.

Who Should Attend?

- Linux novices who are new to the field
- Working professionals who want to keep up with the latest developments
- Hardware engineers who interface with Linux systems or networks
- Software developers who program devices or applications on Linux
- System administrators who set up or maintain Linux systems

Curriculum

Certificate | 2 Quarters | 14 Units

Linux Introduction | 2.5 Units

This course introduces the Linux operating system. Linux is gaining popularity on personal computers, devices, embedded systems and enterprise servers. The course gives you an opportunity to use Linux for personal or professional purposes. You will learn basic Linux administration, Linux file and directory structure, basic network configuration, shell programming, and various utilities available in Linux. The course provides a hands-on approach for learning Linux through assignments and projects.

Computer Networking Essentials | 2.5 Units

This course introduces computer networking, networking technologies, and the Internet, and explores the technical areas in data communications, wide-area networking, local-area networking, and protocol design. You will gain a strong foundation in networking protocols, hardware, cabling, industry standards, and connectivity solutions. Topics include the OSI and TCP/IP models of Internet-working; physical layer fundamentals; connectors and cabling; the network, transport, and upper layers; and network management techniques and technologies.

Linux Systems Programming | 3 Units

System calls are functions from within a C program which provide access to the lowest level resources of an OS. This course will enable C programmers to understand and implement standard utilities (e.g. ls, wc, cat). It provides a strong foundation in the concepts, functional interfaces and topics related to I/O control, file systems, access, docking, signal handling, process and threads management, IPC using pipes and TCP/UDP sockets. You'll also discuss makefiles, man pages and rpm packaging utilities, the development of a complete ftp package, including client-side interface and server-side components.

C Programming for Beginners | 3 Units

This course is for individuals who want to learn C programming language but have little or no programming background. The course begins with an overview of programming and tools. It introduces functions, data types, input/output, strings, operators, precedence, and expressions. It also demonstrates the use of control statements, arrays, and pointers for problem solving. Receive assignments to write nontrivial programs and learn to create modular programs with efficiency.

Linux System and Network Administration | 3 Units

This course provides the foundation for building and maintaining a server for Linux professionals and system administrators in a business environment. The course focuses on basic network configuration, services security, remote access configuration and administration of a Linux server. You'll perform basic administrative tasks for users, file systems, security policy, shell and Perl scripts, and network facilities such as NFS, DNS and DHCP. By the end of the course, you'll be able to administer and manage networked services on Linux-based platforms in a business environment.



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Additional Curriculum

Certificate & OPT | 3 Quarters | 29 Units

Linux System Performance in the Cloud and Data Center | 3 Units

This course covers Linux workload characterization, system profiling, performance management and benchmarking in the cloud and data centers, beginning with measurement and tuning concepts. It reviews how the components of Linux kernel and application API interact and work together seamlessly scalable solutions. You will learn how to identify resource contention issues and how to simulate production workload for problem isolation and benchmarking. You will gain hands-on experience using the rich set of basic and advanced monitoring and tracing tools offered by Linux.

Linux Based Web Application Development - Apache, MySQL, PHP | 3 Units

Linux, Apache, MySQL and PHP, collectively known as LAMP, comprise the majority of servers, databases and scripting languages on the Internet today. LAMP belongs to open-source and is very robust and easily configured. This course teaches LAMP basics including installation, deployment and development of a website. You will learn the basics of programming MySQL (a popular Web database) and PHP (Hypertext Preprocessor, a website scripting language). You will be able to develop basic to intermediate level 3-tier websites and Web applications with a database in the back-end.

Embedded Linux Design and Programming | 3 Units

This course covers the fundamentals of building and installing a custom embedded Linux for an ARM 9 processor platform, and provides hands-on experience for creating cross-platform environments using the GNU tools. You'll learn the basic concepts for designing, testing, and customizing embedded Linux, including how the Linux scheduler is implemented, and how to write Linux kernel modules and remotely debug the embedded Linux applications.

Linux Kernel Architecture and Programming | 3 Units

This course provides an introduction to kernel-level programming in Linux and writing kernel modules. Core kernel is covered at both the conceptual and practical/coding levels. The course starts with the kernel source code organization and how it functions. It covers memory management, file systems, process creation and scheduling, interrupts, kernel synchronization, device drivers, and performance tuning. Discussion addresses various data structures and algorithms used in the Linux kernel.

Linux Device Drivers | 3 Units

This course briefly reviews architecture and driver concepts and discusses the design and implementation of Linux device drivers in both datacenters and embedded systems environments. You will learn about kernel resource management for device drivers, their allocation and deallocation, interfaces to context management and building custom kernels. Topics include character device interfaces, time and timing, memory and address management, interrupt handling and debugging techniques. The instructor will share code samples and real-world experiences of device and kernel porting.

Storage Technology in Data Centers | 3 Units

This course explores the storage technologies needed to meet the challenges of data centers and introduces the building blocks of enterprise storage such as SAN and DAS. It demystifies the technology and the business aspects of storage performance, replication, backup, recovery, tiering and SLA. You will learn about storage and server virtualization environments and how to establish a baseline for performance, capacity and power criteria. The course also covers the blueprint of cloud computing and the implementation of public, private and hybrid cloud storage.

Internships (unpaid) | 3 Units Minimum 90 Hours Per Quarter

Enrolling in a certificate program allows you to participate in multiple unpaid internships at local companies in your field of study. Internships are available across a variety of sectors, generally at mid-sized companies, such as Aglytyx, Crowdera Inc, Innowest, and YMedia Labs. Good internships are much sought after and highly competitive. To stand the best chance of securing your preferred placement, our Internship Coordinators are on hand with expert support and guidance.

Courses in the certificate programs are subject to change based on schedule availability and/or student aptitude. Equivalent course substitutions will be made to accommodate.