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| **COURSE CODE AND NAME:** SIS 3101 Systems Administration | | | |
| **COURSE LEVEL:** Year 3, Semester I | | | |
| **COURSE CREDIT:** 4 CU | | | |
| **Brief Course Description**  The course covers systems and network administration in a networked UNIX environment. It deals with common system administration tasks and practices and how to implement and maintain standard services like email, file sharing, DNS and similar. The course is primarily deals with the UNIX operating system and especially with Linux-based servers, but some information about the most fundamental differences between various UNIX systems will be provided | | | |
| **Course Objectives**   * To introduce the student to the Implementation account management and policies on a UNIX/linux system * To expose the student to the security, permissions, access levels and safeguards on the UNIX/linux system * To expose the student to networked UNIX/linux systems, backups, restorations and scheduling tasks | | | |
| **Detailed Course Description** | | |  |
| * UNIX/Linux installation and Network Setup, Dual Operating Systems installation ;System Startup and Shutdown; The init Daemon ; /etc/inittab ; The inittab Actions ; The init Command | | | (10 hours) |
| * File System Basics; Common UNIX/LINUX Commands , Advanced File System Concepts; Advanced commands | | | (10hours) |
| * User administration; User Account creation, Account Management, Security, permissions and group access levels, | | | (10hours) |
| * Archiving and peripheral configuration , Scripting and Scheduling of tasks; Tune the User Environment and System Environment Variables ; Configure and Use System Log Files; ; Automate and Schedule System ;Administration Tasks ; Maintain an Effective Data Backup Strategy | | | (12hours) |
| * Disk Management ; Making a File System ,The mkfs Command ;Sharing File systems ;The mount Command ;The fstab File ;The fsck Command | | | (8hours |
| * Configuring TCP/IP; The /etc/hosts File ; The ifconfig Command ; The /etc/services File ;The inetd Daemon ;The /etc/inetd.conf File ;Simple TCP/IP Troubleshooting: The ping and nets tat Commands | | | (10hours) |
| **Mode of delivery**  This course is taught by lectures, tutorials, practical assignments, and examinations. | | | |
| **Assessment**  The course is assessed by assignment, tests and final examinations whose contributions are shown below: | | | |
|  | Assignment  Tests  Final course Examination  Total | 15%  25%  60%  100% | |

**Learning Outcomes**

By the end of the course students will be able to:

* Implement account management and policies on a UNIX/linux system
* Maintain security, permissions, access levels and safeguards on the UNIX/linux system
* Run networked UNIX/linux systems, backups, restorations and scheduling tasks

**References:**

# Aeleen Frisch. Essential Windows Nt System Administration. O'Reilly Vlg. GmbH & Company, 1998.

1. Nemeth. Unix System Administration Handbook, 3/E. Pearson Education, 2008.

# Tom Adelstein, Bill Lubanovic. Linux System Administration. O'Reilly Media, Inc., 2007.

1. Tom Carpenter. Microsoft Windows Operating System Essentials. John wiley & Sons, 2012.
2. Pawan K Bhardwaj . How to Cheat at Windows System Administration Using Command Line Scripts. Syngress Publishinh Inc.
3. By Æleen Frisch. Essential System Administration: Tools and Techniques for Linux and Unix . O’Reilly, 2002.

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| **INTRODUCTION TO DATA COMMUNICATION AND NETWORKING** | | | | |
| **Course Code and Name:** | | **SCS 2103 & IT213 Introduction to Data Communication and Networking** | | |
| **Course Level:** | | **Year 2, Semester I** | | |
| **Course Credit:** | | **4 CU** | | |
| **Contact Hours:** | | **60 Hours** | | |
| **Course Brief Description:**  This course introduces the student to the history and classification of networks; LAN, WAN; basic communications and transmission modes. It also introduces the student to the ISO, OSI models; 7-layer model; fundamental concepts; principles, protocols, and applications. The student will also be introduced to routing, transport, congestion/flow control; Ethernet, ATM, and TCP/IP. | | | | |
| **Course Objectives:**  The objectives of the course are to:   1. Introduce the student to the different concepts of computer networks; 2. Expose the student to the methods of setting up computer networks; 3. Impart to the student the practical skills of configuring, setting up and maintaining simple LAN networks; 4. Impart to the student the practical skills of configuring, setting up and maintaining simple Wireless LAN networks; | | | | |
| **Learning Outcomes:**  By the end of the course, the student should be able to:   1. Show a basic understanding of computer network design; 2. Demonstrate practical knowledge to set up basic computer networks; 3. Use the learned knowledge/information to troubleshoot computer networks; 4. Set up and maintain simple LAN networks; 5. Configure, set up and maintain simple Wireless LAN networks; | | | | |
| **Detailed Course Outlines:** | Introduction to computer networks: Definition of a communications network, Concept of a node and links to for networks. Types of network: LANS WANS AND ISPS, point-to-point connections, circuit –switched networks, message–switched networks. | | | (10 hours) |
|  | **Types of Communication**: Client and server communication, broadcast, unicast and multicast modes, simplex, duplex and half-duplex information flow. | | | (8 hours) |
|  | **Open System interconnection**: The server layers of the OSI reference model, communications between layers, service primitives and communication between adjacent layers, encapsulation of PDUs, segmentation and reassembly by protocol layer. | | | (8 hours) |
|  | **Physical layer**: Transmission media, Synchronous transmission, bit timing, shift register, principles of clock encoding, Manchester encoding. | | | (6 hours) |
|  | **Cabling**: 10Base5 Thick Ethernet, 10BT Unshielded twisted pair, higher speed communication at 100 Mbps, I Gbps and 10 Gbps, 11 Mbps wireless. | | | (10 hours) |
|  | **Data link layer**: Role of the data link layer, medium access control layer, access to the shared medium (cable), collision detection. LAN Interconnection: Repeaters and bridges, switches, routers. | | | (10 hours) |
|  | **Introduction to Data Communication**: TCP/IP model overview, the network layer, protocol stacks, TCP/IP stack, Internet Protocol, names and addresses, network address. | | | (8 hours) |
| **Mode of delivery:**  This course is taught by lectures, tutorials, assignments, practical sessions and student presentations. | | | | |
| **Assessment:** | Assignments:  Tests:  Final course Examination:  **Total** | | 15%  25%  60%  100% | |
| **Reading List/ Study Materials:**  **Online Material:**  Links to up-to-date online materials to be provided by the course lecturer in the developed course outline/course schedule  **Journals Articles and/or Conference Papers:**  Links to up-to-date Journal articles and conference paper materials to be provided by the course lecturer in the developed course outline/course schedule  **Books:**   * Kurose, F. James and Ross Keith. (2012). Computer Networking: A Top-Down Approach”, 6th edition. Pearson-Addison-Wesley. ISBN-10: 0132856204, ISBN-13: 978-0132856201   Natalia Olifer and Victor Olifer. (2006). Computer Networks: Principles, Technologies and Protocols for Network Design. Wiley. ISBN-10:0470869828, ISBN-13: 978-0470869826  Larry L. Peterson, Bruce S. Davie. (2007). Computer Networks: A Systems Approach, Fourth Edition (The Morgan Kaufmann Series in Networking), Morgan Kaufmann; 4 Edition.  ISBN-10: 0123705487, ISBN-13: 978-0123705488  Nader F. Mir. (2006). Computer and Communication Networks. Prentice Hall PTR; 1 Edition. ISBN-10: 0131747991, ISBN-13: 978-0131747999  Douglas E. Comer. (2003). Computer Networks and Internets with Internet Applications. 4th Edition. Prentice Hall. ISBN-10: 0131433512, ISBN-13:978-0131433519 | | | | |