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Subject Name	L	T	P	Credits
Linux Administration & Basics	3	1	2	5

Course Objectives:

- To familiarize students with the Linux environment.

- To learn Command line operations and Linux file structure.

- To learn managing user accounts.

- To Learn Local Security Principles.

- To learn the fundamentals of shell scripting/programming.

Unit-I

Introduction to Linux: Linux distributions, more about Linux distributions, linux structures and installations, Installing the Linux system, System startup and shut-down process. ,The Boot Process, BIOS Processes- The First Step, Master Boot Records (MBR) and Boot Loader, The Linux Kernel, The Initial RAM Disk.
Graphical Interface: Session Management: CLI & GUI, GNOME Desktop Environment, GUI Startup, Logging In and Out, Locking the Screen, Switching Users, Shutting Down and Restarting, Suspending.
Network Manager and configuration: Network Configuration, Wired and Wireless Connections and its configurations, Mobile Broadband and VPN Connections.

Unit-II

Command line operations: Introduction to the Command Line and its operations ,Using a Text Terminal on the Graphical Desktop, Launching Terminal Windows, The X Window System, Virtual Terminals, Turning off the Graphical Desktop,sudo,Steps for Setting up and Running sudo.
Basic Operations: Logging In and Out, Rebooting and Shutting Down, Locating-applications, Accessing Directories using command prompt, Absolute and Relative Paths, Exploring the Filesystem, Hard and Soft (Symbolic) Links, Symbolic Links, Navigating the Directory History.
Working with files: Standard File Streams, I/O Redirection, Pipes, Searching for Files, finding fields in a Directory, Finding Files Based on Time and Size. Viewing Files, touch and mkdir, Removing a File, Renaming or Removing a Directory, Modifying the Command Line Prompt.
Installing software: Package Management Systems on Linux, Package Managers: Two Levels, Working With Different Package Management Systems.
File Operations: Introduction to filesystem and its hierarchy, Partition in linux, Mount points, The Network Filesystem, NFS on the Server and client, proc Filesystem,
The Filesystem Architecture: Overview of Home Directories, The /bin and /sbin Directories, The /dev Directory, The /var and /etc Directories, The /boot Directory, The /lib and /media-directories, Additional directories under /, Subdirectories under /usr.Comparing files and file types: Using diff3 and patch, using the 'file' utility,

Unit-III

User Environment: Use and configure user accounts and user groups-Identifying the Current User, Basics of Users and Groups, Adding and Removing Users, Adding and Removing Groups, The Root Accounts and sudo, Elevating to root Account, Startup files, Order of the Startup files.

Environment-Variables: Setting Environment Variables, the HOME Variable, the PATH Variable, the PS1 Variable, the SHELL Variable.

Command Aliases: Creating Aliases, File Ownership, File Permission Modes and chmod, chown, chgrp.

Text Editors: Creating Files Without Using an Editor,nano and gedit,More advanced editors:vi and emacs.Introduction to vi:vimtutor,modes in vi,working with files in vi,Searching for text in vi,Wokring with text in vi. Introduction to emacs: Working with emacs, Changing Cursor Positions in emacs, searching for Text in emacs, working with Text in emacs.

Unit-IV

Local Security Principles: User accounts, Types of accounts, Understanding the root account, operations that required to the root privileges and do not required , Creating a new user in Linux, sudo,comparing sudo and su,sudo features, the sudoers files, Command logging, Process isolation, Hardware device access.

Working with passwords: How passwords are stored, Password Encryption, Securing the Boot Process and Hardware Resources: Requiring Boot Loader Passwords, Hardware Vulnerability.

Unit-V

Bash Shell Scripting: Various types of shell, shell programming in bash, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, shell keywords, Creating Shell programs for automate system tasks and report printing, use of grep in shell, awk programming. Manipulate strings to perform actions such as comparison and sorting, Create temporary files and directories, Create and use random numbers.

Reference Books:

1. Linux Administration: A Beginner's Guide by Steve Shah,Wale Soyinka, ISBN 0072262591(0-07-226259-1), McGraw-Hill Education
2. Unix for programmers and users (3rd Edition)- Graham Glass & King ables,Pearson Education India.(Low Prices Edition)
3. UNIX Concepts and Applications by Sumitabha Das,Tata Mcgraw hill publications.
4. Unix and Linux System Administration Handbook, by Evi Nemeth,Garth Snyder, Trent R. Hein,Ben Whaley.
5. Linux System Administration,By Tom Adelstein,Bill Lubanovic.

Course Outcomes:

- Student will get familiar with Linux Environment.
- Student will learn command line operations, installation packages, Filesystem Architecture.
- Student will be able to use text editor and setup environments variabls.
- Able to apply security features.

- Student will be able to apply Bash Shell Scripting.

List of Experiments

1. Installation of Red HAT Linux operating system.
   a. Partitioning drives
   b. Network configuration
   c. Setting time zones
   d. Creating password and user accounts
   e. Shutting down
2. Write basic commands of Linux with its output.
3. 3.Create new user in Linux operating system and also run commands to change password and delete user.
4. Study all type of ls command with syntax.
5. Configure Following network command: ifconfig, netstate, host,arp , iwconfig, hostname , nslookup, route, dig, ping.
6. Study of Grep command in linux with syntax.
7. Write a shell script that presents a multiple choice question gets the users answers and report back whether the answer is right, wrong or not one of the choices Program.
8. Write a shell script to evaluate arithmetic operations.
9. Write a shell script to calculate simple interest.
10. Write a shell script to determine a given year is leap year or not.
11. Write a shell script to calculate Fibonacci series.
12. Write a shell Script to determine largest among three integer number.
13. Configure environment variable in Linux
14. Configure Change file permission and change ownership
15. Software selection and installation.
16. Installation package yum, RPM.

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Subject Name	L	T	P	Credit
Building Software Applications Using JAVA	3	1	4	6

Course Objectives:

- To learn basic concepts of Java.

- To learn Concepts of Object Oriented Programming in Java.

- To learn Multithreading and Exception Handling.

- Learn to develop GUI based applications.

- To learn event handling and database connectivity.

Unit-I

Introduction to C/C++, History of Java: Comparison of Java and C++, Java as an object oriented language: Java Features, Concept of CLASSPATH, Data types, Operators - precedence and associatively, Type conversion, The decision making–if, if....else, switch, loops–for, while, do...while, special statements–return, break, continue, labeled break, labeled continue, arrays, memory allocation and garbage collection in java, keywords.

Unit-II

Object Oriented Programming in Java: Class, Packages, scope and lifetime, Access specifies, Constructors, Copy constructor, this pointer, finalize () method, Inheritance: Inheritance basics, method overriding, dynamics method dispatch, and abstract classes. Interfaces: defining an interface, implementing & applying interfaces, variables in interfaces, extending interfaces, Wrapper classes.

Unit-III

Collections: The collections framework, collection interfaces, collection classes. **Multithreading and Exception Handling:** Basic idea of multithreaded programming, The lifecycle of a thread, Creating thread with the thread class and runnable interface, Thread synchronization, Thread scheduling, Producer -consumer relationship, Daemon thread, Selfish threads, Basic idea of exception handling, The try, catch and throw, throws Constructor and finalizers in exception handling.

Unit-IV

Applets: Applet security restrictions, the class hierarchy for applets, Life cycle of applet, HTML Tags for applet. **The AWT**: The class hierarchy of window fundamentals, The basic user interface components Label, Button, Check Box, Radio Button, Choice menu, Text area, Scroll list, Scroll bar, Frame, Layout managers-flow layout, Grid layout, Border layout, Card layout.

Unit-V

The Java Event Handling Model: Java's event delegation model– Ignoring the event, Self contained events, Delegating events, The event class hierarchy, The relationship between interface, methods called, parameters and event source, Adapter classes, Event classes action Event, Adjustment Event, Container Event, Focus Event, Item Event, Key Event, Mouse

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Event, Text Event, Window Event. **JDBC:** JDBC-ODBC Bridge, The connectivity model, the driver manager, navigating the resultset object contents, java.sql Package.

Reference Books:

1. Naughton & Schildt "The Complete Reference Java 2", Tata McGraw Hill
2. Deitel "Java- How to Program:" Pearson Education, Asia
3. Horstmann & Cornell "Core Java 2" (Vol I & II), Sun Microsystems
4. Ivan Bayross "Java 2.0": BPB publications
5. Ivor Horton's "Beginning Java 2, JDK 5 Ed., Wiley India.

Course Outcomes:

- Student will learn basic concepts of Java programming

- Understand concepts of object oriented programming.

- Design and implementation programs of Exception handling, Packages

- Design and implementation of Graphical user interface.

- Able to apply event handling and database connectivity.

List of Experiments

1. Program to print "Hello World" on the output screen.

2. Program to perform addition of two numbers.

3. Program to perform swapping using another variable.

4. Program to perform swapping without using another variable.

5. Program to find greatest number among three number using "nested if-else".

6. Program to print table of "2" using for loop.

7. Program to print reverse of a given number.

8. Program to calculate factorial using "while loop".

9. Program to implement calculator using "switch...case".

10. Program to implement concept of "Break…..continue".

11. Program to implement concept of "Do…while" loop.

12. Program to check whether the number is palindrome or not.

13. Program to find sum of elements stored in array.

14. Program to sort elements of an array.

15. Program to perform implicit and explicit conversion in java.

16. Program to implement concept of class and object.

17. Program to perform operation on packages.

18. Program to implement constructor and parameterized constructor.

19. Program for copy constructor.

20. Program for parameterized constructor (constructor overloading).

21. Program to implement single level, multilevel inheritance.

22. Program to implement overriding.

23. Program to implement concept of super used for function and constructor.

24. Program for implementing and applying interface in java.

25. Program for variables in interfaces and extending interface.

26. Program to implement wrapper classes in java.

27. Program to implement array list in collection frame work.

28. Program to implement vector in collection frame work.

29. Program to implement Linked List in collection frame work.

30. Program to implement priority queue in collection frame work.

31. Program to implement stack in collection frame work.

32. Program to implement tree set in collection frame work.

33. Program to implement Arithmetic exception.

34. Program to implement Array index out of bound exception.

35. Program to implement Null pointer exception.

36. Program to implement various functions in multithreading.

37. Program to implement switching between two threads.

38. Program to print "Hello" on applet.

39. Program for various graphics functions available in applet.

40. Program for insert image in applet.

41. Program for insert and use button in AWT.

42. Program for login page demo.

43. Program to count number of characters in textbox.

44. Program to implement calculator using concept of event handling.

45. Program to implement registration form using JDBC.

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Subject Name	L	T	P	Credit
Computer Graphics	3	1	2	5

Course Objectives:

- To introduce the use of the components of a graphics system and become familiar with building approach of graphics system components and algorithms related with them.
- To learn 2-D geometrical transforms and 2-D Viewing.
- To learn 3-D object representation and 3-D geometric transformations of objects.
- To understand visible surface detection methods and rendering methods.
- To learn and apply basic concepts of OpenGL.

Unit-I

Introduction: Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices, Modelling, Rendering. **Output primitives:** Points and lines, tine drawing algorithms, midpoint circle and ellipse algorithms. Filled area primitives: Scanline polygon fill algorithm, boundary-fill and flood-fill algorithms. **Computer animation**: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame system, Motion specification.

Unit-II

2-D Geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.**2-D Viewing:** The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen- Sutherland and Cyrus-beck line clipping algorithms, Sutherland - Hodgeman polygon dipping algorithm.

Unit-III

3-D Object Representation: Polygon surfaces, quadric surfaces. Spline representation, Hermite curve, Bezier curve and B-spine curves. Bezier and B-spline surfaces, sweep representations, octrees BSP Trees.**3-D Geometric transformations:** Translation,rotation, scaling, reflection and shear transformations, composite transformations, 3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and Clipping.

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Unit-IV

Visible surface detection methods: Classification, face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub division and octree methods.

Illumination Models and Surface rendering Methods: Basic illumination models, polygon rendering method.

Unit-V

OpenGL-Basic idea OpenGl,Rendering pipeline of OpenGl ,Basic setup code and buffers,Matrix modes,Drawing basic OpenGl primitives,viewing in open Gl,Basic initialization code for viewing,Depth testing.(Z –buffering).**Introduction of OpenGl shading**:Shading,Types of shading,Lighting ,types of lighting.Introduction of Ray Tracing.

TEXT BOOKS

- "Computer Graphics C version", Donald Hearn and M. Pauline Baker, Pearson education.
- "Computer Graphics Second edition", Zhigand xiang. Roy Plastock, Schaum's outlines. rats Mc Graw 19 edition.
- The OpenGl Programming Guide Seventh Edition(The Red Book) by shreiner,Wooetal.

REFERENCE BOOKS

- Computer Graphics Principles & practice, second edition In C, Foley, VanDam, Feiner and Hugues, Pearson Education.
- Procedural elements lot Computer Graphics, David F Rogers. Tata Mc Graw hill,2nd edition.
- Principles of interactive Computer Graphics. Neuman and Sprout TMH.
- Principles of Computer Graphics. Shalni, Govil-Pal, Springer.
- 'Computer Graphics. Steven Harrington, TMH
- Computer Graphics F.S.H. S.M.Kelley. PHI.
- Computer Graphics P.Shirley, Sieve Marschner a Others, Cengage Learning.
- Computer Graphics & Animation. M.C.Trivedi. Jaico Publishing House
- An Integrated Introduction to Computer Graphics and Geometric Modelling. R.Gopdman, CRC Press, Taylor&Francis Group.
- Computer Graphics. Rajesh K Maurya India

Course Outcomes:
- To list the basic concepts used in computer graphics.

- Gain knowledge about 3-D object representation and transformation.

- To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.

- Ability to solve problems related to visible surface detection and rendering.

- Able to understand and apply OpenGL.

List of Experiments

1. Study about computer graphics library and draw a hut by using it.

2. Write a program to implement DDA line generation algorithm.

3. Write a program to implement Bresenham's line generation algorithm.

4. Write a program to implement midpoint circle generation algorithm.

5. Write a program to implement Bresenham's circle generation algorithm.

6. Write a program to implement Boundary fill algorithm.

7. Write a program to implement Flood fill algorithm

8. Write a program for translation of a triangle using 2d transformation.

9. Write a program for rotating a triangle using 2d transformation.

10. Write a program for Scaling of a triangle using 2d transformation.

11. Write a program for reflection of triangle using 2d transformation.

12. Write a program to Implement Composite 2d Transformations

13. Write a program for translation, rotation, scaling, and reflection of triangle using 3d transformation.

14. Write a program for animation (moving object).

15. Write a program for parallel projection.

16. Write a program for perspective projection.

17. Introduction of openGL libraries.

18. Write a program to create a window using openGl.

19. Write a program to implement DDA line algorithm using openGl.

20. Study about ray tracing.

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Subject Name	L	T	P	Credit
Data Communication and Network	3	1	-	4

Course Objectives:

- To understand the basic concepts of data communication, layered model, protocols.

- Analyze the services and features of various protocol layers in data networks.

- To learn about MAC Layer,ALOHA.

- To understand Network and Transport Layer Protocols.

- To understand Presentation And Application Layer Protocols.

Unit-I
Introduction: Layered Network Architecture, Review of ISO-OSI Model, Introduction to TCP/IP Model.; Data Communication Techniques; Pulse Code Modulation (PCM), Differential Pulse Code Modulation (DPCM), Delta Modulation (DM); Multiplexing Techniques; Frequency Division, Time Division, Statistical Time Division Multiplexing; Physical Layer: Transmission Media: Wires, Cables, Radio Links, Satellite Link, Fiber Optic.; Error Detection and Correction: Single and Burst Error, parity Check Codes, Cyclic Redundancy Code & Hamming Code.

Unit-II
Data Link Layer Protocols Stop and Wait Protocols: Noise free and Noisy channels, performance and efficiency, Sliding Window Protocols: Go Back and Selective Repeat ARQS, performance and efficiency, verification of protocol. HDLC and ATM: HDLC data link protocol, ISDN, Channel Structure, Asynchronous Transfer Mode(ATM), ATM Cells, Header and Cell Format. Layers in ATM Class 1,2,3,4 traffic.

Unit-III
Medium Access Control Sub layer Concept of Random Access, Pure ALOHA throughput characteristics of ALOHA Throughputs for finite and infinite populations S-ALOHA., LAN: IEEE 802.3, 802.4 and 802.5 Protocols performance of Ethernet. Token Ring Protocol, FDDI Protocol, Distributed Queue Dual Bus (DQDB) Protocol.

Unit-IV
Network and Transport Layer Protocols General Principles, Virtual circuits and datagram's, Windows flow control, Packet Discarding, Traffic Shaping, Choke RSVP, Network Layer in ATM, Internetworking using Bridge, Routers and Gateways, Routing Algorithms: Optimality principle, shortest path routing-Dijkstra, Flooding and broadcasting, distance vector routing, link state routing, flow based routing, Multicasting routing flow and congestion control. Internet Architecture and Addressing. Transport Layer: Design issues, Quality of Services, Primitives Connection Management: Addressing, Connection Establishment and Releases. Flow control and Buffering, Crash recovery, Element of TCP/IP protocol: User Data gram Protocol, (UDP/TCP)Layering.

Unit-V
Presentation And Application Layer Protocols Presentation concepts SNMP Abstract Syntax notation. I (ASN-I), Cryptography: Substitutions and Transposition, Ciphers, Data

Encryption Standard (DES), DES Chaining, Breaking DES, Public Key Cryptography, Authentication Protocols.

Reference Books:

1. A. S. Tanenbaum "Computer Network: Second Ed. Prentice Hall, India (tan).

2. B. A. Frouzan, Data Communication, Tata Mc Graw Hill.

3. D. Berekas an R. Gallager, "Data Networks:, second Ed. Prentice Hall, India.

4. D. E. Coner, "Intertworking with TCP/IP", Vol-I.Prentice Hall India.

5. G. E. Keiser, "Local Area Network", Mc Graw Hill, International Ed.

6. W. Stalling, "Data & Computer Communications", Maxwell Macmillan Internation Ed.

Course Outcomes:

- Student will be able to understand Layered Network Architecture.

- Able to explain different protocols at Data Link Layer.

- Understand Medium Access Control Sub layer.

- Will be able to explain about Network and Transport Layer Protocols.

- Explain Presentation And Application Layer Protocols.

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Subject Name	L	T	P	Credit
Computer Organization & Architecture	3	1	-	4

Course Objectives:

- To learn number system and binary arithmetic.

- To understand Boolean algebra an logic gates.

- To learn SOP, POS, Kmap.

- To understand working of flip-flops.

- To learn about different types of counters.

Unit-I

Number systems and Arithmetic Different number systems and their inter conversions. Binary arithmetic: Binary addition, subtraction, multiplication and division. Hexadecimal arithmetic: Addition, subtraction, multiplication and division. Binary subtraction suing 1's complement, 2's complement method, overflow, underflow, codes, fixed point representation, floating point
representation.

Unit-II

Boolean algebra and logic gates postulates of Boolean algebra theorems of Boolean algebra: Complementation, commutative, AND, OR. Associative, Distributive, Absorption laws, demurrage's theorems.Reducing Boolean expressions. Logic gates: AND, OR, NOT, Ex-OR, EX-NOR NAND and NOR as Universal gates.

Unit-III

Minimization techniques Introduction to SOP and POS minterms, midterms, K-map, Kmap for 2,3,4,5variables, don't care condition. Combinational and Arithmetic logic Circuits Half Adder and full Adder Binary Parallel Adder Half Subtract or, full subtract or Multiplexer and Demultiplexer.

Unit-IV

Flip Flops Introduction: RS FF Clocked RS FF, DFF Triggering preset and clear JK FF, TFF, Race around condition Master Slave FF.

Unit-V

Counters Introduction: Asynchronous / Ripple Counter Modules counter, MOD-12 counter, Synchronous counter : Synchronous serial and synch. Parallel counter BCD counter Ring counter Johnson counter Shift registers – Introduction, buffer register serial in serial out, serial in parallel out parallel in serial out, parallel in parallel out.

Reference Books:

1. M. Morris Mano, "Computer System Architecture", PHI, 3rd edition, 1993
2. Govindarajalu "Computer Architecture & Organisation".

3. M.Mano "Digital Logic & Computer Design"
4. Malvino, "Digital Computer Electronics".

Course Outcomes:

1. To describe various number system and codes.

2. To apply Boolean laws and rules to simplify simple expressions.

3. To experiment combinational and sequential circuits.

4. To identify and illustrate basic organization of computer.

5. To illustrate the memory concepts, I/O devices and peripherals

Subject Name	L	T	P	CREDIT
Information and Communication Technology-1	-	-	2	0

Course Objectives:-
The course is designed to aim at imparting a basic level programme for students.After completing the course students will be able to use computer technology.

Contents:
Unit-1
Knowing computer:
What is Computer, Basic Applications of Computer; Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Computer Memory, Concepts of Hardware and Software , Types of software, Concept of Computing,Computer program, Data and Information; Applications of IECT; Connecting keyboard, mouse, monitor and printer to CPU and checking power supply.

Unit-2
Operating Computer using GUI Based Operating System:
What is an Operating System; Basics of Popular Operating Systems; The User Interface, Using Mouse; Using right Button of the Mouse and Moving Icons on the screen, Use of Common Icons, Status Bar, Using Menu and Menu-selection, Running an Application, Viewing of File, Folders and Directories, Creating and Renaming of files and folders, Opening and closing of different Windows; Using help; Creating Shortcuts, Basics of O.S Setup; Common utilities.

Unit-3
Understanding Word Processing:
Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document.

Using Spreadsheet:

Basics of Spreadsheet; Manipulation of cells; Formulas and Functions; Editing of SpreadSheet, printing of SpreadSheet.

Unit-4

Google Classroom:

First Login: Go to classroom.google.com , Join a Class with the Class Code , The Stream , Add a Student Post to the Stream , Announcements & Questions , Assignments , Turn In Assignments ,Assignment Details , Unsubmit Assignments , Google Calendar Integration , Google Drive Folders , Google Classroom Navigation.

Course Outcome:-

At the end of course, students will be able to

1. **Operate the personal computer system**
2. **Use the various hardware devices**
3. **Use the various features of operating system for effective utilization of computer system**
4. **Use the various applications to prepare the documents**
5. **Use google classroom.**

Activities:

SN	Activity
1.	Identification of various computer hardware
2.	Connection of CPU , monitor , printer.
3.	Booting of operating system
4.	Understand drives in window operating system
5.	Create and manage files and folder tree use accessories utilities of windows os
6.	● Entering and editing text in a document file. ● Apply formatting features on text like bold, italics, underline, font type, colour and size. apply features like bullet, numbering ● Create documents, insert images, format tables ● Create and manipulate tables
7.	● Entering and editing data in worksheet

	● Apply formula and functions in the sheet ● Use graphics and auto shapes in excel sheet ● Create and manipulate excel charts create pay bills, pay slips, electricity bills using excel ● Print sheet using print area
9.	Join A google classroom and submit an assignment.