Unit-1
Introduction: Basic concepts of the operating system. Commands, shells and processes; users and groups; file system and directories. System installation, configuration and upgrade. Installation stages; network installation; disk partitioning; post-install system customization and upgrade; dpkg and APT package installation, remove, upgrade and query; semiautomatic system installation.

Kernel
Kernel tasks; managing kernel modules at runtime; kernel configuration and compilation boot loaders GRUB and LILO;

Unit-2
Linux Networking
Basic concepts of networking: Network packets, TCP/IP protocol suit, address resolution protocol (ARP); IP addresses and network mask; subnets and routing; IPV4 and Network classes; ports. Configuring Linux machine on the network; arp, ipconfig and netstat commands. Network services and tools; telnet, rsh, ftp, rcp, ssh, rsync, inetd.conf; opening and closing ports.

Network File System (NFS)
File system sharing or the network; remote procedure call (RPC) services; NFS server and client sides; NFS installation & configuration; and statistic mount and auto mount configuration; when trouble shooting NFS; security and optimization

Network information service (NIS)
Centralized authentication systems; sharing user and host information or the network; NIS server and client sides and configuration; compatibility mode; net group; security issues.

Unit-3
Integrating Linux and Windows
Elements of windows networking; Net BIOS SMB\\ CIFS protocols; domain controller; Samba server on Linux for centralized window logon; file sharing and printing, samba client; samba installation and configuration; Unix and windows password. Dual Boot: running windows and Linux on the same PC; GRUB and NT Boot loaders; accessing windows files systems from Linux and vice versa;

Light Weight Directory Access Protocol (LDAP)
Overview of Unix authentication and naming service; introduction to LDAP: Domain component (DC); organizational Unit (OU); common names (CN); Schemas; IDIF format; services; polls and commands; server and client sides; Open LDAP installation and configuration; LDAP applications. Shell scripting, syntax of brash; looping; case statement; function; command substitution; awk, grep, sed. Startup and Run Levels. Scheduled jobs. Boot up and login process sequence; run levels; startup scripts; scheduling jobs with at and cron.

Unit-4
Linux Security
System vulnerabilities; port scanning; encryption, encrypted services and connections; PGP/GPG Intrusion protection: tcp-wrappers, IP-firewalls (iptables), NAT and DMZ; Intrusion detection systems: tripwire; Secure system management practices.

**Email Server**
Steps of Email transaction; Email envelope and headers; SMTP servers; IMAP and POP3 servers; E-mail relay; Postfix configuration; Spam and viruses,

**Linux Computational Clusters**
Overview of Linux cluster and clustering tools; High performance Computational Clusters; Message Passing Interface (MPI) for parallel programming; MPI compilation and installation; Scheduling and queue systems. Sun Grid Engine (SGE); cluster management tools.

**Domain Name Server (DNS)**
Host name resolution; domain name hierarchy; DNS zones; configuration of master, slave and caching DNS servers with BIND 9.

**Books Recommended:**
1. Red Hat Linux 9 – Bell & Duff- Pearson
2. Complete Reference, Red Hat Linux-Richard L. Peterson – TMH
3. Linux N/W Administration Guide by Tery Dawson, Gregor N. Purdy, Tony Bautts – OREILLY
4. Red Hat Linux 9 Bible-Christopher Negus by WILEY publishing
5. Linux Configuration & Installation by Patrick Volker Ding, Kevin Richard, Eric Foster-Johnson BPB publication
6. Linux Programming Bible by John Goerzen-Wiley Dream Tech India (P) Ltd.

Note: 8 questions will be set in all by the examiners taking at least one question from each unit.
Students will be required to attempt five questions in all.
Unit –1 Introduction:
Introduction to optical communication-Fibers and their characteristics. Propagation of Light in optical fibers: modal dispersion, material dispersion and attenuation, numerical. Aperture, figure of merit. Single mode, multimode step index and graded index fibers.

Unit –2 Fiber manufacture.

Introduction to DWDM. ITU channel specification. DWDM Network Topologies

Addressing networking.
ISDN Physical layer – line coding techniques, basic user network interface – primary rate. User network interface – U interface.
ISDN Data Link Layer – LAPD, bearer channel link control 1.465/120. Frame mode Bearer service and protocol. ISDN call control, frame relay connection control.
Signaling system number 7: SS& architecture. Signaling data link level, signaling link level. Signaling network level, signaling connection control part

Unit –4

Books Recommended:
1. ISDN and Broadband ISDN –William Stallings Mc million pub co.
2. Broadband communication-Balaji Kumar-Mc Graw Hill
3. Integrated broadband networks-Handel & Huber Addison Wesley.
5. Optical Network –A Practice Perspective, Rajiv Ramaswami, Kumar Sivaranjan-Morgan Kanufuman
6. High Speed Digital Transmission Networking-filberts held john Wiley sons

Note: 8 questions will be set in all by the examiners taking at least one question from each unit.
Students will be required to attempt five questions in all.
IT – 467  Neuro-Fuzzy Computing
L T  Exam Sessional. Duration
4 1 100 40 3Hrs.

Unit -1
Basic concepts of neurocomputing:
Artificial Neural Networks (ANN) and their biological roots and motivations. ANNs as numerical data/signal/image processing devices. Encoding (training phase) and decoding (active phase). Taxonomy of neural networks: feed forward and recurrent networks with supervised and unsupervised learning laws. Static and dynamic processing systems. Basic data structures: mapping of vector spaces, clusters, principal components.

Basic terminology related to an artificial neuron:
A summing dendrite, synapses and their weights, pre- and post-synaptic signals, activation potential and activation function. Excitatory and inhibitory synapses. The biasing input. Types of activating functions.

Unit -2
The Perceptron
The Perceptron and its learning law. Classification of linearly separable patterns.

Linear Networks

Unit -3
Multi-Layer Feed Forward Neural Networks

Self-Organizing systems.

Unit –4
Competitive Learning:

Self-Organising Feature Maps
Kohonen networks.

Recurrent Networks
Hopfield networks.

Fuzzy Logic Systems
Basic definitions and operations. Fuzzy relations. Fuzzy rules Fuzzy inference Fuzzification and de- fuzzification Adaptive Neuro-Fuzzy Inference Systems

Recommended references:
Neural Networks & Fuzzy Systems by KOSKO-PHI
Fuzzy Logic to engineering applications- Timothy J. Ross
Fuzzy Control –Driancov
Fuzzy modeling & Control by Yagar
Note: 8 questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.
ARTIFICIAL INTELLIGENCE

Unit-1
Introduction – foundation and history of AI, AI problems and techniques.
AI programming languages, Introduction to LISP and PROLOG.
Problem spaces and searches, Blind search strategies, Breadth first – Depth first –
Heuristic search techniques Hill Climbing – Best first – A Algorithms AO* algorithm –
game trees, Min-max algorithms, game playing – Alpha beta pruning.

Unit – 2
Knowledge representation issues predicate logic – logic programming Semantic nets-
frames and inheritance, constraint propagation; Representing Knowledge using rules,
Rules based deduction systems. Reasoning under uncertainty, Review of probability
bays probabilistic interferences and Dempaster Shafer theory, Heuristic methods,
symbolic reasoning under uncertainty Statistical reasoning fuzzy reasoning, temporal
reasoning non monotonic reasoning.

Unit – 3
Planning, Planning in situational calculus, Representation for planning, Partial order
planning algorithm, learning from examples discovery a learning, Learning by analogy,
Explanation based learning neural nets Genetic algorithms.

Unit – 4
Principles of natural languages processing rule based systems architecture, Expert
systems, Knowledge acquisition concepts AI application to robotics, current trends in
intelligent systems.

Books Recommended:
2. Staurt Russel and other Peter Norvig, “Artificial Intelligence – a Modern Approach”,
Prentice Hall.
4. Artificial Intelligence & Expert System By Patterson – PHI.
Note: 8 questions will be set in all by the examiners taking at least one question from
each unit. Students will be required to attempt five questions in all.
Introduction:
Compilers and translators, the structure of a compiler, different states in the construction of a compiler.

Unit-2
Finite automata and Lexical Analysis- language for specifying lexical analyzers, implementation of lexical analyzers. Syntax specification of programming language, context free grammars, derivation and implementation of lexical analyzers. Parsers, shift reduce parsing, operator-precedence parsing, top down parsing, predictive parsers, LR parsers, the canonical collection of LR(O) ITEMS, Construction SLR parsing tables, construction Tables, implementation of LR parsing tables.

Unit-3
Syntax direct translation schemes: Implementation of syntax directed translation intermediate code, postfix notation, parse trees and syntax trees, three address code, quadruples and triple, translation of assignment statement, Boolean expressions, Control statements. Symbol table, contents and data structure, and representation scope information. Run time storage administration, implementation of a simple stack allocation structured languages. Error detection and recovery –lexical, syntactic-phase error, semantic error, detection and recovery.

Unit-4
Code Optimization: The principal sources of optimization, loop optimization, The DAG Representation of basic blocks, value numbers and algebraic claws, global data flow analysis. Object programs, problems in code generation a machine model code generator, register allocation and assignment, code generation from DAG’s peephole optimization.

Books Recommended:
1. Aho, a.v. and A.V. and Ullman J.D., “Principal of Compiler design”, Addison-Wesley.

Note: 8 questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.
1. Install Linux on the system dual boot with the windows Operating System.

2. Do the following tasks:-
   a. Create, remove, resize various types of partitions through GUI as well as command line.
   b. Configure printers in Linux through GUI as well as command line.

3. Creating, Removing of Swap space as well as swap files trough command line as well as GUI.

4. Implementation Disk Quotas- enabling, creating, mounting, configuring, assigning, disabling.

5. Managing Users and Groups in Linux- Adding, Modifying, Password aging.


7. Configuring NFS (Network File System) on Linux both GUI & Command Line.

8. Configuring Samba server on Linux both GUI & Command line.

9. Configuring D.N.S (Domain Name system) server on Linux both GUI & Command Line.

10. Configure an e-mail server in Linux-send mail.

11. Configuring Firewalls and Managing various services of Linux.


**Note**: Students should perform at least 10 experiments from the list.
1. Create a Subroutine with arguments passing & call the subroutine for specific no. of time.
2. Write a program in ASP which define an object & then display the properties of object with method.
3. Write a program in ASP to display present day, month & date. Also display digital clock.
4. Write a program in ASP which will check that a specific file, folder & drive exists or not. Also return the extension of file. Then use the read & write properties on a file using text-stream object.
5. Send information to the user after he submit the form using GET & POST method & implement from validation.
6. Write a program in ASP that has a form taking the user’s name as input. Store this name in a permanent cookie & whenever the page is opened again, then value of the name field should be attached with the cookie’s content.
7. Use ad-rotator to change advertisements on client side request.
8. Create a session dictionary using object tag. In session-on start add keys for time, user agent, remote I.P. & add appropriate values. Create a simple page to display the values.
9. Implement session tracking using user authentication.
10. Write a program to delete all cookies of your web site that has created on the client’s computer.
11. Write a program is ASP to check the capabilities of the browser using browser capability component.
12. Using data base to store & retrieves values input by a user showing them & make updating & add new records to existing database.
13. Create two ASP pages, a form creation web page (selectprice.asp) and a form processing script (liststockbyprice.asp). In selectprice.asp, the user should be shown a form in which he can enter the item & desired maximum price. When it is submitted liststockbyprice.asp will return all the stocks from database whose cost are less
than the price entered by user.

**Note:** Students should perform at least 10 experiments from the list.
BBC Lab (IT-461)

L T P
- - 3
1. Setting Up Fiber Optic Analog Link & Fiber Optic Digital Link.
2. Propagation loss in Optical Fiber.
5. Characteristics of F.O. communication Link.
6. Setting of Fiber Optic Voice Link using AM-FM & PWM.
8. Set up hardware for ISDN and Study of ISDN Instruments 1. ISDN Telephone 2. Terminal Adaptor (For the interface of Analog Telephone and PC)
9. Software setup and programming of the ISDN equipment.
10. Establishing voice communication between ISDN phone & analog phone via Terminal Adaptor.
11. Study the basic Principle of Radio Frequency identification & Designing of RFID system.
12. Design & develop the program based on application of RFID.
13. To study Theoretical & Practical hardware Training on Bluetooth.

Note: Students should perform at least 10 experiments from the list.