RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL
Credit Based Grading System
Information Technology, VI-Semester
IT-6001 Internet Technology and Network Management

Unit-I

Binding Protocol Address: ARP & RARP, packet format, Encapsulation, Internet protocol: Introduction, Ipv4 header, Ipv4 Datagram, Encapsulation, Fragmentation and Reassembly, IP routing, Subnet addressing, Subnet mask, Supernetting- special case of IP addresses Ipv6-Motivation, frame format and addressing, comparison of Ipv4 and Ipv6.

Unit-II

ICMP: Introduction, ICMP Header, ICMP message types, ICMP timestamp request and reply, trace route, ping program. Intra & inter domain routing-distance vector routing, RIP, Link State Routing, OSPF, Path Vector Routing, BGP, Unicast Routing protocols, IGMP-IGMP message, operation, encapsulation.

Unit-III

TCP: Introduction, services, headers, connection establishment and termination, timeout of connection establishment, maximum segment size- half, close, state transition diagram, port no. and socket addresses, TCP timers. UDP: Introduction, UDP header, UDP checksum, UDP operations, encapsulation & decapsulation, queuing, SCTP-Services, transmission sequence number, stream identifier, stream sequence number, packet format.

Unit-IV
BOOTP: operation, packet format, DHCP: Address allocation, configuration & packet Format,

DNS: Distribution of name spaces, DNS in the internet, FTP: Connection, Communication, command processing, TFTP, E-mail: SMTP, POP & IMAP, SNMP: Management components, SMI, MIB.

Unit-V

Network management applications:-Configuration management, Fault Management, Performance management, Security management, Accounting management, Report Management, policy based management.

References:-

1. B. A Forouzan, TCP/IP-Protocol suite, TMH.
2. D.E.Comer, Computer Networks and Internets, Pearson.
3. Mani Subramaniam , Network management- principles & practice, Pearson education.
4. W. Richard Stevens, TCP/IP Illustrated Volume I, Addison Wesley.
5. Comer, Internetworking with TCP/IP: Vol. I, II & III, PHI Learning.

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL
Credit Based Grading System
Information Technology, VI-Semester
IT-6002 Software Engineering

Unit I

Introduction, Software- problem and prospects Software development process: System Development Life Cycle, Waterfall Model, Spiral Model and other models, Unified process- Agile development-Agile Process- Extreme Programming- Other agile Process models.

Unit II

Measures, Metrics and Indicators, Metrics in the Process and Project Domains, Software Measurement, Metrics of Software Quality, S/W reliability, Software estimation techniques, LOC and FP estimation. Empirical models like COCOMO, project tracking and scheduling, reverse engineering.

Unit III

Software requirements and specification: feasibility study, Informal/formal specifications, pre/post conditions, algebraic specification and requirement analysis models, Specification design tools. Software design and implementation: Software design objectives and techniques, User interface design, Modularity, Functional decomposition, DFD, Data Dictionary, Object-oriented design, Design patterns implementation strategies like top- down, bottom-up.

Unit IV

Coding standard and guidelines, programming style, code sharing, code review, rapid prototyping, specialization, construction, class extensions, intelligent software agents, reuse performance improvement, debugging. Software Testing Strategies: Verification and Validation, Strategic Issues, test plan, white box, black-box testing, unit and integration testing, system testing test case design and acceptance testing, maintenance activities.

Unit V

Software Maintenance: Software Supportability, Reengineering, Business Process Reengineering, Reverse Engineering, Restructuring, Forward Engineering, Economics of Reengineering, project scheduling and tracking plan, project management plan, SQA and quality planning, SCM activities and plan, CMM, Software project management standards, Introduction to component based software engineering.

References:
1. P,S. Pressman, Software Engineering. A Practitioner's Approach, TMH.
2. Rajib Mall, Fundamental of Software Engineering, PHI.
3. Hans Van Vliet, Software Engineering, Wiley India Edition.
4. James S. Peters, Software Engineering, Wiley India Edition.
5. Pankaj Jalote, Software Engineering: A Precise Approach, Wiley India.
6. Kelkar, Software Project Management, PHI Learning

List of Experiments:

Sample Problems:

    a. Library Management System

    b. Automated banking system

    c. Airline reservation system

    d. Employee management application

    e. Hospital management Application

Suggested Lab work for above given problems:

1. Develop requirements specification for sample problems (The requirements specification should include both functional and non-functional requirements).

2. Develop DFD Model (Level 0, Level 1 DFD and data dictionary) of the sample problems (Use of a CASE tool required).

3. Design Class diagram for sample problems.

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL
Credit Based Grading System
Information Technology, VI-Semester
IT-6003 Computer Graphics and Multimedia

Unit I

Introduction to Raster scan displays, Storage tube displays, refreshing, flickering, interlacing, colour monitors, display processors resolution, working principle of dot matrix, inkjet laser printers, working principles of keyboard, mouse scanner, digitizing camera, track ball, tablets and joysticks, graphical input techniques, positioning techniques, rubber band techniques, dragging etc.

Unit II

Scan conversion techniques, image representation, line drawing, simple DDA, Bresenham's Algorithm, Circle drawing, general method, symmetric DDA, Bresenham's Algorithm, curves, parametric function, Beizier Method, B-spline Method.

Unit III

2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite transformation, world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D object on 2D screen, Point Clipping, Line Clipping Algorithms, Polygon Clipping algorithms, Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection, phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV.

Unit IV

Introduction to multimedia components applications, Multimedia System Architecture, Evolving technologies for Multimedia, Defining objects for Multimedia systems, Multimedia Data interface standards, Multimedia Databases, Multimedia Hardware, SCSI, IDE, MCI, Multimedia Tools, presentation tools, Authoring tools.

Unit V

Compression & Decompression, Multimedia Data & File Format standards, TIFF, MIDI, JPEG, DIB, MPEG, RTF, Multimedia I/O technologies, Digital voice and audio, Video image and animation, Full motion video, Storage and retrieval technologies.

References:-

1. Donald Hearn and M.Pauline Baker, Computer Graphics C Version, Pearson Education, 2003.

2. Prabat K Andleigh and Kiran Thakrar, Multimedia Systems and Design, PHI Learning,

3. Tay Vaughan, Multimedia making it work, Tata McGraw Hill edition.

4. Amarendra N Sinha & Arun D Udai, Computer Graphics, McGraw Hill publication.

5. Mukherjee, Fundamental of Computer Graphics and Multimedia, PHI Learning.

List of Experiments:

1.Write a program to implement DDA line drawing algorithm

2.Write a program to implement Bresenham's line drawing algorithm.

3.Write a program to implement Bresenham's circle drawing algorithm.

4.Write a program to draw an ellipse using Bresenham's algorithm.

5.Write a program to perform various transformations on line , square & rectangle.

6.Write a program to implement Cohen Sutherland line clipping algorithm.

7.Write a program to implement Liang-Bersky line clipping algorithm.

8.Write a program to implement Cohen-Sutheland polygon clipping algorithm to clip a polygon with a Pattern.

9.Write a program to convert a color given in RGB space to it's equivalent CMY color space.

10.Study of various Multimedia file formats:-RTF,MIDI,GIF,JPEG,MPEG,TIFF etc.

11.Write a program to implement JPEG compression scheme for still images.

12.Write a program to perform Packbits compression & decompression.

13.Write a short program to create a TIFF file using bitmap segments and text files as the TIFF File components.

14. Write a program to convert a BMP file into either JPEG or GIF file.

15.Study of various Multimedia Authoring Tools.

UNIT-I: Introduction to Compiler, analysis of source program, phases and passes, Bootstrapping, lexical analyzers, data structures in compilation – LEX: lexical analyzer generator, Input buffering, Specification and Recognition of tokens, YACC, The syntactic specification of programming languages: Context free grammars, derivation and parse trees, capabilities of CFG.

UNIT-II: Syntax Analysis: working of Parser, Top down parsing, Bottom-up parsing, Operator precedence parsing, predictive parsers, LR parsers (SLR, Canonical LR, LALR), constructing SLR parsing tables, constructing Canonical LR parsing tables, Constructing LALR parsing tables, using ambiguous grammars, an automatic parser generator.

UNIT-III: Syntax Directed Translation: Definitions, Inherited Attributes, L-attributed definitions, S-attributed definitions, Dependency graph, Construction of syntax trees, Top down translation, postfix notation, bottom up evaluation.

UNIT-IV: Intermediate Code Generation: Three address code, quadruple & triples, translation of assignment statements, Boolean expression and control structures, Backpatching, Run Time Memory Management: Static and Dynamic storage allocation, stack based memory allocation schemes, Symbol Table management.

UNIT-V: Code Optimization and Generation: organization of code optimizer, basic blocks and flow graphs, DAG representation of basic blocks, loops in flow graph, peephole optimization, Basic of block optimization.

Reference Books:

1. A. V. Aho, R. Sethi & J. D. Ullman, Compilers: Principles, Techniques & Tools, Pearson Ed.
2. Alfred V. Aho, Jeffrey D. Ullman, Principles of Compiler Design, Narosa Publishing House.
3. Ronald Mak, Writing Compilers and Interpreters, Wiley India Edition.
4. Louden, Compiler Construction, Cengage learning.

List of Experiments:

1. Study of LEX tool and its installation in LINUX.
2. Write a program to identify string using lex tool.
3. Write a program to find keyword and identifiers using lex tool.
4. Write a program to count all character using lex tool.
5. Design a lexical analyzer for given language and the lexical analyzer should ignore redundant spaces, tabs and new lines.
6. Write a program to calculate First and Follow of a Grammar.
7. Write a program to construct LL(1) parser for given language.
8. Write a program to construct an operator precedence parser for a given language.
10. Write a program to construct a recursive descent parser for an expression. Study of YACC tool and installation in Linux operating system.
11. Write a program for implementing a calculator for computing the given expression using semantic rules of the YACC tool.
12. Write a program for implementing Shift Reduce parsing and LR parsing.
13. Write a program for generating various intermediate code forms i) Three address code ii) Polish notation.

Unit I

Discrete-Time Signals and Systems

Discrete-time signals, discrete-time systems, analysis of (DTLTI) discrete-time linear time-invariant systems, discrete time systems described by difference equation, solution of difference equation, implementation of discrete-time systems, stability and causality, frequency domain representation of discrete time signals and systems.

Unit II

The z-Transform

The direct z-transform, properties of the z-transform, rational z-transforms, inversion of the z transform, analysis of linear time-invariant systems in the z- domain, block diagrams and signal flow graph representation of digital network, matrix representation.

Unit III

Frequency Analysis of Discrete Time Signals

Response of LT1 systems to arbitrary inputs (Convolution sum), circular convolution, Discrete Fourier transform (DFT), properties of DFT, two dimensional DFT.

Unit IV

Efficient Computation of the DFT

FFT algorithms, Radix 2 FFT, Decimation in time algorithm, Decimation in frequency algorithm, Decomposition for 'N' composite number.

Unit V

Digital filters Design Techniques

Design of IIR and FIR digital filters, Impulse invariant and bilinear transformation, windowing techniques-rectangular and other windows, examples of FIR filters, design using windowing.

References:

1. Proakis, Digital Signal Processing, Pearson Education.
2. Oppenheim and Schafer, Digital Signal Processing, PHI Learning.
3. Johnny R. Johnson, Introduction to Digital Signal Processing, PHI Learning.
4. Rabiner and Gold, Theory and Application of Digital Signal Processing, PHI Learning.
5. S. Salivahanan, Digital Signal Processing, TMH.

Unit I: Characterization of Distributed Systems: Introduction, Examples of distributed Systems, Resource sharing and the Web Challenges. System Models: Architectural models, Fundamental Models Theoretical Foundation for Distributed System : Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamport's & vectors logical clocks. Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non token based algorithms.

Unit II: Distributed Deadlock Detection: system model, resource Vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed dead lock detection, path pushing algorithms, edge chasing algorithms. Agreement Protocols: Introduction, System models, classification of Agreement Problem, Byzantine agreement problem, Consensus problem.

Unit III: Distributed Objects and Remote Invocation: Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study. Security: Overview of security techniques, Distributed File Systems: File service architecture, Sun Network File System, The Andrew File System.

Unit IV: Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Replication: System model and group communication, Fault-tolerant services, Transactions with replicated data.

Unit V: Distributed Algorithms: Destination based routing, APP (assignment problem in parallel), Deadlock free Packet switching, Introduction to Wave & traversal algorithms, Election algorithm. CORBA Case Study: CORBA, CORBA services.

References:-

1. P K Sinha, Distributed operating systems: Concepts and design, PHI Learning.
2. Sunita Mahajan & Shah, Distributed Computing, Oxford Press.
3. Tanenbaum and steen, Distributed systems: Principles and paradigms, PHI Learning.
4. Singhal & Shivaratri, Advanced Concept in Operating Systems, McGraw Hill.
5. Coulouris, Dollimore, Kindberg, Distributed System: Concepts and Design, Pearson Ed.
6. Gerald Tel, Distributed Algorithms, Cambridge University Press.

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

Credit Based Grading System

Information Technology, VI-Semester

Elective –II IT-6005(3): Web Technology

UNIT I

History of the internet, internetworking concepts, architecture, and protocol: switch, router, protocols for internetworking, internet address and domains. Introduction to World Wide Web (WWW), working of web browser and web server, Web server and its deployment, N-tier architecture, services of web server, Common gateway interface (CGI), Uniform Resource Locator (URL), format of the URL, Hyper Text Transfer Protocol (HTTP), feature of HTTP protocol HTTP request-response model, Hyper Text Transfer Protocol Secure (HTTPS).

UNIT II

Introduction to Hyper Text Markup Language (HTML), HTML elements, XHTML syntax and Semantics, eXtensible Markup Language (XML), element, attributes, entity declarations, DTD files and basics of Cascading Style Sheet (CSS).Document object Model (DOM) history and levels, Document tree, DOM event handling.

UNIT III

Introduction to Java Script, Basic concepts, variables and data types, functions, conditional statements, Loops, Operators, Arrays, Standard Objects and form processing in Java.

UNIT IV

Evaluation of web applications, type of web documents, feature of web pages, multitier web applications, introduction to Apache web server, Security in application: authentication, authorization, auditing, security issues, security on the web, proxy server, Firewall. Middleware Concepts, CORBA, Java Remote Method Invocation (RMI), Message Oriented Middleware (MOM), EJB, Microsoft's Distributed Component Object Model(DCOM) Web Servers HTTP request types System Architecture Server side Scripting. Web server and its deployment, Web client, services of web server, mail server proxy server, multimedia server.

UNIT V

Introduction to servlet, Overview Architecture Handling HTTP Request, Get and post request, redirecting request multi-tier applications, Introduction to JSP, basic JSP, Java Bean class and JSP. Setting up an Open Data Base Connectivity (ODBC) data source.

References:-

1. J. C. Jackson, Web Technologies: A computer science perspective, Pearson Education.
2. A. S. Godbole & A. Kahate, Web Technologies: TCP/IP Architecture, and Java Programming, TMH.
3. Paul S. Wang Sanda, S Katila, An Introduction to Web Design, Programming, CENGAGE Learning.
4. N.P.Gopalan, J.Akilandeswari, Web Technology: A developer's Perspective, PHI Learning.

Course Objective
Acquaint the students with the basic concepts of Intellectual Property Rights; and sensitize the students with the emerging issues in IPR and the rationale for the protection of IPR.

UNIT I Introduction
Introduction and Justifications of IPR, Nature of IP, Major forms of IP- *Copyright, Patent, Trade Marks Designs, Geographic indication, layout design of Semi conductors, Plant varieties, Concept & Meaning of Intellectual Property.*

Major international documents relating to the protection of IP - *Berne Convention, Paris Convention, TRIPS*. The World Intellectual Property Organization (WIPO).

UNIT II Copyright
Meaning and historical development of copyright , Subject matter , Ownership of copyright, Term of copyright, Rights of owner, Economic Rights, Moral Rights. Assignment and licence of rights, Infringement of copyright, Exceptions of infringement, Remedies, *Civil, Criminal, Administrative*, Registration Procedure.

UNIT III Patents

Meaning and historical development,. Criteria for obtaining patents, Non patentable inventions, Procedure for registration, Term of patent, Rights of patentee, Compulsory licence, Revocation, Infringement of patents, Exceptions to infringement, Remedies, Patent office and Appellate Board.

UNIT IV – Trade Marks, Designs & GI Trade Marks:
Functions of marks, Procedure for registration, Rights of holder, Assignment and licensing of marks, Infringement, Trade Marks Registry and Appellate Board.

Designs: Meaning and evolution of design protection, Registration, Term of protection, Rights of holder, unregistered designs.

Geographical Indication: Meaning and evolution of GI, Difference between GI and Trade Marks, Registration, Rights, Authorised user.
UNIT V Contemporary Issues & Enforcement of IPR

IPR & sustainable development, The Impact of Internet on IPR. IPR Issues in biotechnology, E-Commerce and IPR issues, Licensing and enforcing IPR, Case studies in IPR

References:
1. P. Narayanan, Intellectual Property Law, Eastern Law House
2. Neeraj Pandey and Khushdeep[Dharni, Intellectual Property Rights, PHI, 2014
3. N.S Gopalakrishnan and T.G. Agitha, Principles of Intellectual Property, Eastern Book Co. Lucknow, 2009.
4. Anand Padmanabhan, Enforcement of Intellectual Property, Lexis Nexis Butterworths, Nagpur, 2012.
5. Managing Intellectual Property The Strategic Imperative, Vinod V. Sople, PHI.
6. Prabuddha Ganguli, " Intellectual Property Rights" Mcgraw Hill Education, 2016.

Course Outcome:

1. Students will be able to understand Primary forms of IPR
2. Students will be able to asses and critique some basic theoretical justification for major forms of IP Protection
3. Students will be able to compare and contrast the different forms of IPR in terms of key differences and similarities.
4. Students will be able understand the registration procedures related to IPR.
5. Students will be exposed to contemporary issues and enforcement policies in IPR.

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL
Credit Based Grading System
Information Technology, VI-Semester
IT-6007 Creativity and Entrepreneurship Development

Course Objective:

Understand and use tools for generating entrepreneurial ideas and problem solving. Understand and use tools for the selection of ideas.

Understand and gain the skills that are needed to implement ideas in today's society

Understand Entrepreneurship's part in process that includes idea generation and

implementation.
Understand the concept of Entrepreneurship and its place in today's society

Course Outcomes:
Recognize an opportunity for a user group and frame an appropriate design challenge that

addresses the need for the user.
Practice observation, interview and empathy skills to evolve a thorough understanding of

the needs of the user.
Share and integrate team leanings.

Generate, develop and describe creative ideas that address the design challenge.

Syllabus:

1. The concept of Entrepreneurship, its history and its place in society.
2. The concept of Entrepreneurship and its relation to concept of innovation.
3. Creative processes for idea generation and problem solving.
4. Business plan.
5. Role of creativity, innovation and business research.
6. Entrepreneurship opportunities in contemporary business environment.

Reference Books :

1. Dollinger M.J. "Entrepreneurship strategies and resources," 3rd edition Pearson Education New Delhi.
2. Panda, Shiba charan "Entrepreneurship development", Anmol publication New Delhi.
3. Richard Blundel & Nigel locket, "Exploring Entrepreneurship : practices & perspectives Oxford.
4. Charles E. Banford & Garry D. Bruton, "Entrepreneurship – A small business Approach, Mcgrawhill Education.
5. P. Narayana Reddy, "Entrepreneurship" : Text and cases, Cengage learning
6. Rajeev Roy, "Entrepreneurship" Oxford.