

Chhattisgarh Swami Vivekanand Technical University, Bilai (C.G.)

Scheme of teaching and examination

B.E. Seventh Semester Computer Science & Engineering

S. No	Board of Study	Subject Code	Subject Name	Periods per week			Scheme of examination			Total Marks	Credits [L+(T+P)/2]
				L	T	P	ESE	CT	TA		
1	Comp. Science & Engg.	322711(22)	Internet & Multimedia Technology	3	1	-	80	20	20	120	4
2	Comp. Science & Engg.	322712(22)	Parallel Processor & Computing	3	1	-	80	20	20	120	4
3	Comp. Science & Engg.	322713(22)	Network Programming	3	1	-	80	20	20	120	4
4	Comp. Science & Engg.	322714(22)	Operations Research	3	1	-	80	20	20	120	4
5	Refer Table-2		Professional Elective-2	4	-	-	80	20	20	120	4
6	Comp. Science & Engg.	322721(22)	Soft Computing Lab	-	-	4	40	-	20	60	2
7	Comp. Science & Engg.	322722(22)	Network Preprogramming Lab	-	-	4	40	-	20	60	2
8	Comp. Science & Engg.	322723(22)	Software Technology Lab - 4	-	-	4	40	-	20	60	2
9	Comp. Science & Engg.	322724(22)	Minor Project	-	-	5	100	-	40	140	3
10	Management etc	300725(36)	Innovative & Entrepreneurial Skills	-	-	2	-	-	40	40	1
11	Comp. Science & Engg.	322726(22)	Practical Training ** Evaluation / Library	-	-	1	-	-	40	40	1
TOTAL				16	4	20	620	100	280	1000	31

L-Lecture, T- Tutorial, P- Practical, ESE- End Semester Examination, CT- Class Test, TA-Teacher's Assessment

*** To be completed after VI Semester and before the commencement of VII Semester**

Professional Elective-II (Table-2)

S.No.	Board of Studies	Subject Code	Subject Name
1	Comp. Science & Engg.	322751(22)	Digital Image Processing
2	Comp. Science & Engg.	322752(22)	Advanced Computer Architecture
3	Comp. Science & Engg.	322753(22)	Cellular & Mobile Computing
4	Comp. Science & Engg.	322754(22)	Enterprise Resource Planning
5	Comp. Science & Engg.	322755(22)	Cryptography & Network Security
6	Comp. Science & Engg.	322756(22)	Fault Tolerant System
7	Comp. Science & Engg.	322757(22)	Natural Languages Processing
8	Comp. Science & Engg.	322758(22)	OODBMS

Note-1 : 1/4 of total strength of students subjects to Minimum Strength of twenty students is required to offer an elective in the college in a particular academic session.

Note -2 : Choice of elective course once made for an examination cannot be changed for future examination.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: VII

Subject: Internet & Multimedia Technology.

Total Theory Periods: 40

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322711(22)

Total Tut Periods: 12

UNIT-I Theory of Internet:-

Introduction, Evolution of Internet, Internet applications, Internet Protocol: TCP/IP Protocol, Versions, Class full addressing, IP data gram, ICMP & IGMP. Functions of ARP and RARP, User Data gram Protocol (UDP), Transmission Control Protocol (TCP): Flow-Control, Error-Control. Internet Security & Firewalls

UNIT-III Bounded Media for Internet :-

Cable media, Telephone network, ISDN: Overview, Interfaces & functions, Physical Layer, Data Link Layer, Network Layer Services, Signaling System Number 7. ATM & B-ISDN : Introduction Services & Applications, Principles & building blocks of B-ISDN, DIAS network.

UNIT-III Un-Bounded Media for Internet :-

Wireless media : Components and working of Wireless network, IEEE 802.11 standards and WLAN types, Ad-hoc networks, MACAW Protocol. Features and Goals of Bluetooth, Bluetooth products and security, TCP Over Wireless & Ipv6 : Mobile IP, support of Mobility on the Internet, Mobile TCP, Traffic Routing in Wireless Networks, Circuit switched Data Services, Packet switched Data services. WLL Architecture, WLL Technologies and frequency spectrum, Local Multipoint Distribution Service (LMDS), Ultra Wideband Technology.

UNIT-IV Introduction to Multimedia :-

Concept of Non-Temporal and Temporal Media. Hypertext and Hypermedia. Presentations: Synchronization, Events, Scripts and Interactivity, Compression Techniques: Basic concepts of Compression. Still Image Compression.: JPEG Compression., Features of JPEG2000. Video Compression: MPEG- 1&2 Compression Schemes, MPEG-4 Natural Video Compression. Audio Compression: Introduction to speech and Audio Compression, MP3 Compression Scheme. Compression of synthetic graphical objects.

UNIT-V Multimedia Systems Technology :

Architecture for Multimedia Support: Multimedia PC/Workstation Architecture, Characteristics of MMX instruction set, I/O systems: IEEE 1394 interface, Operating System Support for Multimedia Data: Resource Scheduling with real-time considerations, File System, I/O Device Management. Multimedia Information Management: Multimedia Database Design, Content Based Information Retrieval: Image Retrieval, Video Retrieval, Overview of MPEG-7, Design of Video-on-demand systems.

Name of Text Books:-

- (1) TCP/IP Protocol Suite By Behrouz A. Forouzan. TMH.
- (2) Multimedia Concept & Practice, Hartman & Carey, PHI

Name of Reference Books :-

- (1) Multimedia Technology, TAY Vaughan, McGraw-Hill
- (2) Virtual Reality Systems, John Vince, Addison Wesley
- (3) ATM Network by Rainer Handel, Manfred N Huber Stijan Schoder, LPE.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VII
Subject: Parallel Processor & Computing.
Total Theory Periods: 40
Total Marks in End Semester Exam: 80.
Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.
Code: 322712 (22)
Total Tut Periods: 12.

UNIT-I: Introduction & Technique of Parallelism:

Trends towards parallel computing, parallelism in Uni-processor systems, Architectural classification schemes, Amdahl's law, Moore's law, Principles of Scalable Performance, Parallel Processing in Memory, Parallel Algorithms, Parallel Algorithm Complexity, Models of Parallel Processing, Cache coherence, Cache coherence Protocols.

UNIT-II: Pipeline & Vector Processing:

Conditions of Parallelism: Data & Resource dependencies, Program flow mechanisms: Control-flow .vs. Data flow computers Principle of pipelining and vector processing: principles of linear pipelining, classification of pipeline processors. General pipelines and reservation tables. Instruction and arithmetic pipelines, vector processing, architecture of Cray –1, Pipeline hazards, VLIW computers, Array Processing.

UNIT-III : Parallel Models & Mesh-Based Architectures

PRAM and Basic Algorithms, Data Broadcasting, Parallel Prefix Computation, Shared-Memory Algorithms, Parallel Selection Algorithm, Sorting and Selection Networks, Selection Networks, Circuit-Level Examples, Tree-Structured Dictionary Machine, Parallel Prefix Networks, Sorting on a 2D Mesh or Torus, Routing on a 2D Mesh or Torus, Types of Data Routing Operations, Greedy Routing Algorithms, Wormhole Routing, Numerical 2 D Mesh Algorithms, Other Mesh-Related Architectures, Meshes of Trees, Low-Diameter Architectures, Hyper-cubes and Their Algorithms, Sorting and Routing on Hypercubes, Bitonic Sorting on a Hypercube, Dimension-Order Routing, Broadcasting on a Hypercube, Other Hypercubic Architectures, Butterfly and Permutation Networks, Plus-or-Minus-2'Network, The Cube-Connected Cycles Network , Shuffle and Shuffle–Exchange Networks, A Sampler of Other Networks, Star and Pancake Networks, Ring-Based Networks.

UNIT-IV: Multiprocessor architecture and Programming:

Emulation and Scheduling, Emulations among Architectures, Distributed Shared Memory , Data Storage, Input, and Output, Multithreading and Latency Hiding, Parallel I/O Technology, Defect-Level Methods, Fault-Level Methods, Error-Level Methods, Parallel Programming Parallel Operating Systems, Parallel File Systems.

UNIT-V: Parallel System Implementations:

Shared-Memory MIMD Machines, Variations in Shared Memory, MIN-Based BBN Butterfly, Vector-Parallel Cray Y-MP, CC-NUMA Stanford DASH, Message-Passing MIMD Machines, Data-Parallel SIMD Machines, Processor and Memory Technologies.

Name of Text Books:-

- 1.Computer Architecture & Parallel processing - Kai Hwang 7 Briggs.(MGH).
- 2.Parallel Computers: Arch.& Prog., Rajaraman & Siva Ram Murthy, PHI.

Name of Reference Books :-

1. R.W. Hockney, C.R. Jesshope, "Parallel Computer 2 –Arch..& Algo.", Adam Hilger.
2. K. Hwang, "Advanced Computer Architecture with ParallelProgramming", MGH.
- 3.Parallel computing- Theory and practice - Michael J Quinn- Mc Graw Hill

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: VII

Subject: **Network Programming.**

Total Theory Periods: **40**

Total Marks in End Semester Exam: **80.**

Minimum number of class tests to be conducted: **02.**

Branch: **Computer Science & Engg.**

Code: **322713 (22)**

Total Tut Periods: **12**

Unit- I Networking & TCP/IP:

Communication protocols, Network architecture, UUCP, XNS, IPX/SPX for LANs, TCP & IP headers, IPv4 & v6 address structures, Programming Applications: Time & date routines, Internet protocols: Application layer, Transport layer, Network layer, Datalink layer protocols, Chat, Email, Web server working method & programming.

UNIT-II Socket Programming:

Creating sockets, Posix data type, Socket addresses, Assigning address to a socket, Java socket programming, Thread programming, Berkeley Sockets: Overview, socket address structures, byte manipulation & address conversion functions, elementary socket system calls – socket, connect, bind, listen, accept, fork, exec, close, TCP ports (ephemeral, reserved), Berkeley Sockets: I/O asynchronous & multiplexing models, select & poll functions, signal & fcntl functions, socket implementation (client & server programs), UNIX domain protocols.

UNIT- III APIs & Winsock Programming:

Windows socket API, window socket & blocking I/O model, blocking sockets, blocking functions, timeouts for blocking I/O, API overview, Different APIs & their programming technique, DLL & new API's, DLL issues, Java Beans.

UNIT- IV Web Programming & Security:

Java network programming, packages, RMI, Overview of Javascript, WAP architecture & WAP services, Web databases, Component technology, CORBA concept, CORBA architecture, CGI programming, Firewall & security technique, Cryptography, Digital Signature.

UNIT- V Client Server Programming:

Client side programming: Creating sockets, Implementing generic network client, Parsing data using string Tokenizer, Retrieving file from an HTTP server, Retrieving web documents by using the URL class. Server side programming: Steps for creating server, Accepting connection from browsers, creating an HTTP server, Adding multithreading to an HTTP server.

Name of Text Books:-

1. Steven.W.R: UNIX Network Programming, PHI (VOL I& II)
2. Window Socket Programming by Bobb Quinn and Dave Schutes

Name of Reference Books :-

1. Davis.R.: Windows Network Programming, Addison Wesley
2. NETWORK PROGRAMMING With Windows Socket By Baner .P., PH New Jersey

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: VII

Subject: Operations Research.

Total Theory Periods: 40

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322714 (22)

Total Tut Periods: 12

UNIT –1 LINEAR PROGRAMMING

LP formulations, Graphical method for solving LP with 2 variables, Simplex method, Application of simplex method for maximization and minimization of LP problems, Artificial variable technique for finding the initial basic feasible solution, The Big-M method, Degeneracy in simplex method, Duality theory in LP, Dual simplex method.

UNIT-2 TRANSPORTATION MODEL

North – West corner rule, Least cost method, Vogel's Approximation method, Modi Method, Assignment problem, Dynamic Programming: Basic concepts, Bellman's optimality principle, Dynamic programming approach in decision making, Optimal subdivision problem.

UNIT- 3 INVENTORY MODELS

Introduction to the inventory problem, Deterministic models, The classical EOQ (Economic order quantity) model, Purchasing model with no shortage, Manufacturing model with no shortage, purchasing model with shortage, Manufacturing model with shortage, Inventory models with probabilistic demand.

UNIT –4 SEQUENCING AND QUEUING THEORY

Sequencing problem, Johnson's algorithm for processing N-jobs through 2 machine problem, N-jobs through 3 machine problem, 2- job through N machine by graphical method, Characteristics of queuing system- steady state M/M/1, M/M/1K and M/M/C queuing models.

UNIT- 5 CPM and PERT

Arrow network, Time estimates – Earliest expected time, Latest allowable occurrence time and slack, Critical path, Probability of meeting scheduled date of completion of project, Calculation on CPM network, Various floats for activities, Critical Path, Updating project, Operation time cost trade off curve & project time cost trade off curve, selection of schedule based on cost analysis.

Name of Text Books:-

1. Operation Research-2ed, Panneerselvam, Prentice Hall of India
2. Operation Research: An Introduction - 8rd, Hamdy a.Taha, Prentice Hall of India

Name of Reference Books :-

1. Gillett B.E, Introduction to Operation Research- A Computer Oriented algorithmic approach, Mc Graw Hill.
2. Kanti Swarup, Gupta.P.K., Man Mohan, Operations Research, Sultan Chand & Sons.
3. Vohra N.D., Quantitative Techniques in Management, T.M.H., 1990.
4. Zojnts. S., Linear & Integer Programming, Prentice Hall, 1975.

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: VII

Subject: Digital Image Processing.

Total Theory Periods: 50

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322751 (22)

Total Tut Periods: NIL

Unit I: Introduction:

Image formation model, Spatial & Gray level resolution, Image enhancement in special domain: Piecewise transformation functions, Histogram equalization, Histogram specification, image averaging, spatial filters- smoothing and sharpening, Laplacian filter, Canny edge detector.

Unit II: Image enhancement in frequency domain & Image Segmentation:

2D discrete fourier transform & its inverse, filtering in frequency domain, Ideal & Gaussian low pass filters, High pass filtering, FFT, Line detection, Edge detection, Edge linking & boundary detection, Thresholding, Region based segmentation.

Unit III: Morphological Image Processing:

Logic operations involving binary image, Dialation & Erosion, Opening & Closing, Applications to Boundary extraction, region filling, connected component extraction.

Unit IV: Image Compression:

Coding redundancy- Huffman coding, LZW coding, run length coding, Lossy compression- DCT, JPEG, MPEG, video compression.

Unit V: Image Representation & 3D:

Boundary descriptors, Shape numbers, Texture, Projective geometry, Correlation based and feature based stereo correspondence, shape from motion, optical flow.

Name of Text Books:-

1. Ganzalez and Woods, Digital Image Processing, Pearson education.
2. Sonka and Brooks, Image Processing, TSP ltd,

Name of Reference Books :-

1. Jain and Rangachar, Machine Vision, MGH.
2. Schalkoff, Digital Image Processing, John Wiley and sons.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: VII
Subject: Advanced Computer Architecture.
Total Theory Periods: 50
Total Marks in End Semester Exam: 80.
Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.
Code: 322752 (22)
Total Tut Periods: Nil

Unit I: Pipeline:

Linear pipeline processor: Nonlinear pipeline processor, Instruction pipeline design, Mechanisms, Dynamic instruction scheduling, Arithmetic pipeline design, Super-scalar processors, VLIW architecture.

Unit II: Memory Hierarchy & I/O organization:

Cache memories, Cache coherence, High bandwidth memories, High bandwidth I/O, Disk I/O, Bus specifications and standards.

Unit III: Parallel Computer Models & Program parallelism:

Classification of Machines, SISD, SIMD & MIMD, Condition of parallelism, data and resource dependencies, Program partitioning & scheduling, grain size latency, control flow versus data control, data flow architecture.

Unit IV: Synchronous Parallel Processing:

Vector instruction types, vector access memory schemes, vector and symbolic processors, SIMD architecture, SIMD parallel algorithms, SIMD computers and performance enhancements.

Unit V: System Interconnection:

Network properties and routing, static interconnection networks, dynamic interconnection networks, Multiprocessor system interconnection, Multistage & combining networks.

Name of Text Books:-

1. Flynn, computer Architecture: Pipelined and parallel processor design, JB, Boston.
2. Computer Architecture & Parallel processing - Kai Hwang & Briggs. (MGH).

Name of Reference Books :-

1. R.W. Hockney, C.R. Jesshope, "Parallel Computer 2 –Arch.& Algo.", Adam Hilger.
2. K. Hwang, "Advanced Computer Architecture with Parallel Programming", MGH.
3. Parallel computing- Theory and practice - Michael J Quinn- Mc Graw Hill

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: VII
Subject: Cellular & Mobile Computing.
Total Theory Periods: 50
Total Marks in End Semester Exam: 80.
Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.
Code: 322753 (22)
Total Tut Periods: NIL

Unit-I INTRODUCTION TO MOBILE & WIRELESS DEVICES

Mobile and Wireless Devices, History, Applications, Simplified Reference Model; Wireless Transmission, Frequencies for Radio Transmission, Regulations, Signals, Antennas, Signal Propagation, Multiplexing, Modulation, Wireless LANs And Wireless WANs, Spread Spectrum, FHSS and DSSS Spread Spectrum Technology; Cellular Systems, The Radio Spectrum, Cell Size and Achievable Throughput; Medium Access Control, Specialized MAC; SDMA; FDMA; TDMA; CDMA.

UNIT-II TELECOMMUNICATION & BROADCAST SYSTEMS

GSM; Mobile Services, System Architecture, Radio Interface, Protocols, Localization and Calling, Handover, Security, New Data Services; DECT, TETRA, UMTS & IMT-2000; CDPD, Data Over Analog and Digital Cellular, Paging and Two-Way Paging; Satellite Systems, Applications, GEO, LEO, MEO, Routing, Localization, Handover; Broadcast Systems, Cyclic Repetition of Data, Digital Audio Broadcasting.

UNIT-III WIRELESS NETWORKS

Wireless LAN, Hidden Nodes in Wireless Networks, Ordered MAC Techniques and Wireless Networks, Deterministic MACs for Wireless Networks, Comparison Of MAC Techniques for Wireless Networks; Infrared V/S Radio Transmission; IEEE 802.11, Architecture, Layers, Management; HIPERLAN; Bluetooth; Wireless ATM, Services, Reference Model, Functions, RAL, Handover, Location Management, Addressing, QOS, ACP.

UNIT-IV MOBILE NETWORK AND TRANSPORT LAYERS

Mobile Network Layer; Mobile IP, DHCP, ADHOC Networks; Mobile Transport Layer; Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP; Fast Transmit/Fast Recovery, Transmission/Time Out Freezing, Selective Retransmission, Transaction Oriented TCP.

Unit -V MOBILE SYSTEM DEVELOPMENT & SUPPORT

File Systems; World Wide Web, HTTP; HTML; System Architectures; WAP; Architecture, Wireless Datagram Protocol, Wireless Transport Layer Security, Wireless Transaction Protocol, Wireless Session Protocol, Wireless Application Environment; WML; WMLscript; Wireless Telephony Applications.

Name of Text Books:-

1. Mobile Communications – Schiller, Jochen; 2nd Indian Reprint, Pearson Education Asia – Addison Wesley Longman PTE. Ltd.
2. Wireless and mobile network architecture, Chlamtac, John Wiley and Sons.

Name of Reference Books :-

1. Mobile Data Wireless LAN Technologies – Dayem, Rifaat A.; Prentice Hall International.
2. The Essential Guide To Wireless Communication Applications – Dornan, A.; 1st Indian Reprint, Pearson Education Asia.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: VII

Subject: Enterprise Resource Planning.

Total Theory Periods: 50

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322754 (22)

Total Tut Periods: Nil

UNIT - I

OVERVIEW OF BUSINESS FUNCTIONS :

Business function in an organization, material management, scheduling, shop floor control. Forecasting, accounting & finance, human resources, productivity management.

UNIT- II

TYPICAL BUSINESS PROCESSES

Core processes, product control, sales order processing, purchase, administrative process, human resource, finance support processes, marketing, strategic planning, research & development problems in traditional functional view. Need for integrated process view, information as a resource, motivation for ERP.

UNIT – III

EVOLUTION OF INFORMATION SYSTEM

EDP (electronic data processing) system, management information systems (MIS), executive information systems, information needs of organization, ERP as an integrator of information needs at various levels, decision making involved at the above level.

UNIT – IV

ERP MODELS /FUNCTIONALITY

Sales-order-processing, MRP, scheduling, forecasting, maintenance, distribution, finance, features of each of the models description of data flows across module, overview of the supporting databases, technologies required for ERP.

UNIT – V

IMPLEMENTATION ISSUES

Pre Implementation issues, financial justification of ERP, evaluation of commercial software during implementation issues, reengineering of various business process, education & training, project management, post implementation issues, performance measurement.

Name of Text Books:

1. V.K. Garg & N.K. Venkatkrishnan ; ERP, concepts & practices, PHI.
2. S. Sadagopan : MIS, PHI

Name of Reference Books :-

1. V. Rajaraman : Analysis & Design of Information Systems, PHI
2. K. M. Hussain & D. hussain ; Information systems, Analysis, Design & Implementation, TMH.
3. MONAK & BRADY : Concepts in ERP, vikas pub. Thomson
4. J. Kanter : Managing with information, PHI.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: VII
Subject: Cryptography & Network Security.
Total Theory Periods: 50
Total Marks in End Semester Exam: 80.
Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.
Code: 322755 (22)
Total Tut Periods: NIL

UNIT-I Foundations of Cryptography and Security :-

Ciphers and Secret Message, Security Attacks and Services. Mathematical Tools for Cryptography : Substitutions and Permutations, Modular Arithmetic, Euclid's Algorithm, Finite Fields, Polynomial Arithmetic. Design Principle of Block ciphers: Theory of Block Cipher Design. Cipher Network Structures, DES and Triple DES, Modes of Operation (ECB, CBC, OFB, CFB) , Strength (or Not) Of DES

UNIT-II Block Cipher Algorithms:-

IDEA, CAST, Blowfish , Twofish , Rijndael (AES). Pseudo Random Numbers and stream ciphers: Pseudo random sequences, Linear Congruential Generators, Cryptographic Generators, Design of Stream Cipher , RC4, RC5 .

UNIT-III Public Key Cryptography:-

Prime Numbers and Testing for Primality, Factoring Large Numbers, Discrete Logarithms RSA, Diffie- Hellman, ElGamal , Introduction of Elliptic curve Cryptosystems Key Management , Key Exchange Algorithms, Public – Key Cryptography Standards. Hashes and Message Digests: Message Authentication, MD5, SHA-1, RIPEMD , HMAC

UNIT-IV Digital Signatures, Certificates, and Standards:-

Digital Signature Standard (DSS and DSA), Public key Infrastructure, Digital Certificates and Basics of PKCS Standards. Authentication: Kerberos V 4 and V 5, X.509 Authentication Service. Electronic Mail Security : Pretty Good Privacy (PGP) , S /MIME, X.400 . IP and Web Security Protocols: IPsec and Virtual Private Networks, Secure Sockets and Transport Layer (SSL and TLS).

UNIT-V System Security: -

Computer Virus, Firewall and Design Principles, Reference: Chapter 18 , 19, & 20 of Cryptography and Network Security. Electronic Commerce Security: Electronic Payment Systems, Secure Electronic Transaction (SET), Protocols (CyberCash, iKey) Ecash (DigiCash), Smart Card Based Systems.

Name of Text Books:

Cryptography and Network Security, William Stallings , PHI.

Name of Reference Books :-

Applied Cryptography: Protocols & Algorithms, Schneier & Bruce, MGH International.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: VII
Subject: Fault Tolerant System.
Total Theory Periods: 50
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 02

Branch: Computer Science & Engg.
Code: 322756 (22)
Total Tut Periods: NIL

Unit I Introduction

Definition of fault tolerance, Redundancy, Applications of fault-tolerance, Fundamentals of dependability.

Unit II Attributes

Reliability, availability, safety, Impairments: faults, errors and failures, Means: fault prevention, removal and forecasting

Unit III Dependability evaluation

Common measures: failures rate, mean time to failure, mean time to repair, etc. Reliability block diagrams ,Markov processes .

Unit IV Redundancy

Hardware redundancy, Redundancy schemes, Evaluation and comparison, Applications ,Information redundancy ,Codes: linear, Hamming, cyclic, unordered, arithmetic, etc. ,Encoding and decoding techniques ,Applications , Time redundancy.

Unit V Programming

Software fault tolerance, Specific features, Software fault tolerance techniques: N-version programming, recovery blocks, self-checking software, etc.

Name of Text Books

- 1 Anderson, T., and P.A. Lee, Fault-Tolerant Principles and Practices, Prentice-Hall
- 2 Hwang, K., and F.A. Briggs, Computer Architecture and Parallel Processing, McGraw-Hill. Jalote, P. Fault-Tolerance in Distributed Systems, ISBN 0-13-301367-7, Prentice-Hall,

Name of Reference Books

1. Johnson, B.W., Design and Analysis of Fault-Tolerant Systems, Addison Wesley
2. Leveson, Nancy G., Safeware, system safety and computers, Addison Wesley.
3. Pradhan, D.K., Fault-Tolerant Computing -- Theory and Techniques, (2 Volumes), Prentice-Hall.
4. Pradhan, Dhiraj K., Fault-Tolerant Computer System Design, ISBN 0-13-057887-8, Prentice-Hall PTR

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: VII

Subject: Natural Language Processing.

Total Theory Periods: 50

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322757 (22)

Total Tut Periods: NIL

Unit -I Introduction & Syntactic processing

The study of Language, Linguistic background, Grammars and Parsing, Features and Augmented Grammars, Grammars for Natural Language, Towards Efficient Parsing, Ambiguity Resolution.

Unit -II Semantic Interpretation

Semantics and Logical Form, Linking Syntax and Semantics, Ambiguity Resolution, Strategies for Semantic Interpretation, Scoping and the Interpretation of Noun Phrases.

Unit -III Pragmatics

Discourse: Reference Resolution, Syntactic and Semantic Coherence, Text Coherence, An Inference based resolution algorithm. Dialogue and Conversational Agents: What makes dialogue different? Dialogue structure and coherence.

Unit -IV Natural language Generation

Introduction to language generation, an architecture for generation, surface realization, systemic grammar, functional unification grammar, discourse planning.

Unit -V Machine Translation

Language Similarities and Differences, transfer metaphor, syntactic transformations, lexical transfer, idea of interlingua, direct translation, using statistical Techniques

Name of Text Books:

1. Speech and Language Processing, by Jurafsky, D. & Martin, J.H.
2. Natural Language Understanding (2nd ed.), Allen, J

Name of Reference Books:

1. Foundations of General Linguistics (2nd ed.) by Atkinson, M, Kilby, D A & Roca, I
2. An Introduction to Language (5th ed.), Fromkin, V & Rodman, R
3. Natural Language Processing for Prolog Programmers, by Covington, M A
4. Natural language processing in Prolog: an introduction to computational linguistics, By Gazdar, G & Mellish, C

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
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Semester: VII

Subject: OODBMS.

Total Theory Periods: 50

Total Marks in End Semester Exam: 80.

Minimum number of class tests to be conducted: 02.

Branch: Computer Science & Engg.

Code: 322758 (22)

Total Tut Periods: NIL

Unit I The Extended Entity Relationship Model and Object Model: The ER model revisited, Motivation for complex data types, User defined abstract data types and structured types, Subclasses, Super classes, Inheritance, Specialization and Generalization, Constraints and characteristics of specialization and Generalization, Relationship types of degree higher than two.

Unit II. Object-Oriented Databases: Overview of Object-Oriented concepts, Object identity, Object structure, and type constructors, Encapsulation of operations, Methods, and Persistence, Type hierarchies and Inheritance, Type extents and queries, Complex objects; Database schema design for OODBMS; OQL, Persistent programming languages; OODBMS architecture and storage issues; Transactions and Concurrency control, Example of ODBMS

Unit III. Object Relational and Extended Relational Databases: Database design for an ORDBMS - Nested relations and collections; Storage and access methods, Query processing and Optimization; An overview of SQL3, Implementation issues for extended type; Systems comparison of RDBMS, OODBMS, ORDBMS

Unit IV. Parallel and Distributed Databases and Client-Server Architecture: Architectures for parallel databases, Parallel query evaluation; Parallelizing individual operations, Sorting, Joins; Distributed database concepts, Data fragmentation, Replication, and allocation techniques for distributed database design; Query processing in distributed databases; Concurrency control and Recovery in distributed databases. An overview of Client-Server architecture

Unit V. Databases on the Web and Semi Structured Data: Web interfaces to the Web, Overview of XML; Structure of XML data, Document schema, Querying XML data; Storage of XML data, XML applications; The semi structured data model, Implementation issues, Indexes for text data. **Enhanced Data Models for Advanced Applications:** Active database concepts. Temporal database concepts.; Spatial databases, Concepts and architecture; Deductive databases and Query processing; Mobile databases, Geographic information systems.

Name of Text Books:

1. Rajesh Narang, Object Oriented Interfaces and Databases, Prentice Hall of India
2. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems [3e], McGraw-Hill

Name of Reference books:

- 1 Elmasri and Navathe, Fundamentals of Database Systems [4e], Pearson Education
2. Korth, Silberchatz, Sudarshan , Database System Concepts, McGraw-Hill.
3. Peter Rob and Coronel, Database Systems, Design, Implementation and Management, Thomson Learning.
4. C.J.Date, Longman, Introduction To Database Systems, Pearson Education

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: VII
Subject: Soft Computing Lab.
Total Practical Periods:50
Total Marks in End Semester Exam: 40

Branch: Computer Science & Engg.
Code: 322721 (22)

1. WRITE MATLAB PROGRAM FOR FOLLOWING.

- A) AREA = ? r^2 (USING ARITHMETIC OPERATOR).
 - B) $e^{??(150)}$ (USING EXPONENTIAL OPERATOR).
 - C) $y = \sin^2 ?/3 + \cos^2 ?/3$ (USING TRIGONOMETRY OPERATOR).
 - D) $y = \cos ?/4 + i \sin ?/4$ (USING COMPLEX NUMBER).
 - E) $y = \log_{10}(10^6)$ (USING LOGARITHMS OPERATOR).
2. Compute y- coordinates of a STRAIGHT LINE $y = mx + c$, where slope of line $m = 0.5$, intercept $c = -2$ and x- coordinates : $x = 0$ to 10 for 0.5 increments.
3. Create following vectors t with 10 elements 1 to 10.
- a) $x = t \sin(t)$ [A MULTIPLE VECTORS}
 - b) $y = (t-1) / (t+1)$ [A DIVIDE VECTORS}
 - c) $z = [\sin(t^2) / (t^2)]$ [A EXPONENTIAL VECTORS}
4. PLOT $y = \sin x$ where $0 \leq x \leq 2\pi$.
5. PLOT $y = e^{-0.4x} \sin x$ where $0 \leq x \leq 4\pi$.
6. Write a script file to draw a unit circle.
7. Write a function factorial to compute the factorial n! for any integer n.
- 8.. Write a function factorial to compute the factorial n! using RECURSION for any integer n.
9. Write a function file crossprod to compute the cross product of two vectors u and v.
10. Write a function to compute the geometric series $1 + r + r^2 + r^3 + \dots + r^n$ for given r and n.
11. Write a function that outputs a conversion – table for Celsius and Fahrenheit.
12. Write a function to computes the interest on your account for a given principle amount, period and rate of interest.
13. Check following linear algebra rule for three MATRIX A,B AND C of any ranks.
- a) ADDITION COMMUTATIVE.
 - b) ADDITION ASSOCIATIVE.
 - c) MULTIPLICATION WITH A SCALAR DSTRIBUTIVE.
 - d) MULTIPLICATION WITH A MATRIX DSTRIBUTIVE
 - e) MATRIX ARE DIFFERENT FROM SCALAR.
14. Find the solution of following linear algebraic equations.
- $$\begin{aligned}x + 2y + 3z &= 1 \\3x + 3y + 4z &= 1 \\2x + 3y + 3z &= 2\end{aligned}$$
15. Find Eigen values and eigenvector of a 3 X 3 matrix.

TEXT BOOK

- 1. Matlab Programming: B B Chaudhri & Singh ; Prentice Hall of India
- 2. Matlab- Rudrpratap
- 3. Matlab- Hamitre, Thompson publication

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: VII
Subject: Network Programming Lab.
Total Practical Periods: 50
Total Marks in End Semester Exam: 40.

Branch: Computer Science & Engg.
Practical Code: 322722 (22)

List of Experiments to be performed

(UNIX NETWORK PROGRAMMING)

1. Write an echo program with client and iterative server using TCP.
2. Write an echo program with client and concurrent server using TCP.
3. Write an echo program with client and concurrent server using UDP.
4. Write a client and server program for chatting.
5. Write a program to retrieve date and time using TCP.
6. Write a program to retrieve date and time using UDP.
7. Write a client and server routines showing Blocking I/O.
8. Write a client and server routines showing I/O multiplexing.
9. Write an echo client and server program using Unix domain stream socket.
10. Write an echo client and server program using Unix domain Datagram socket.
11. Write a client and server program to implement file transfer.
12. Write a client and server program to implement the remote command execution
13. Write a client program that gets a number from the user and sends the number to server for conversion into hexadecimal and gets the result from the server.

Text Books:

1. Steven.W.R: UNIX Network Programming, PHI (VOL I& II)

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: VII
Subject: Software Technology Lab-4
Total Practical Periods: 50
Total Marks in End Semester Exam: 40

Branch: Computer Science & Engg.
Practical Code: 322723 (22)

CONSOLE PROGRAMMING

1. Visual Basic .NET – An Introduction of Console and GUI Programming technique, Explain New Project window, property Explorer, Output window, Dynamic help, Window management (Auto Hide, Dockable, Tabbed Documents, IDE navigation, favorites), win forms & webforms
2. WAP to find the Average, Total Grade of student using if else statements (In Console).
3. WAP to input any number between (0—6) and print appropriate day, week.
4. Print the pattern Using For loop.
5. WAP to input numbers in 1D array and print in ascending & descending order.
6. WAP to input number in 2D array and perform the following operations
 - a. Sum of all number
 - b. Forward Diagonal & Backward diagonal
 - c. Print Upper & Lower triangle matrix.
7. WAP to input number in 2D array and perform the following operations
 - a. Sum of two matrices.
 - b. Multiplication of two matrices.
8. WAP to explain Class, Constructor & Inheritance.

GUI PROGRAMMING

1. Design simple calculation to implement Addition, Subtraction and Multiplication and Division.
2. Design the marks sheet of student. Which Display all details including the total marks of student and percentage.
3. Create a form using check box & option box to give the effect of fonts such as Bold, Italic, underline, strike through respectively for the text entered in the Rich Text Box.
4. Demonstrate use of Data Environment, add tables and queries, place field on form, report etc.
5. Create simple Notepad application, which contains menus, Rich Text Box, Common Dialogs Box, formatted text, using toolbar and Replace text, window, status bar and scroll bar.
6. Develop three different programs which use different Data Access Components ODBC,OLE DB-ADO
7. Modify the Practical on 12 to all following Button FIND, ADD, DELETE, MODIFY, CANCEL. Give proper code to perform the activity described by the buttons.

CASE STUDY (Design the and develop one of the following three case studies)

Design a program for online Examination system, which include database and record facility. Develop a program for telephone bill generation, which include database and record facility. Develop a program for super market, include the database and record facility.

List of Equipment/machine required:-

1. Microsoft Visual studio .NET 2003
2. MSDN Library
3. Database (Oracle/MS Access/ Sql. Server)

Text Books :-

1. Black Book (VB .NET)
2. Complete Reference (VB .NET)
3. VB .NET Microsoft Press

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY BHILAI (C.G.)

Semester: VII

Subject: Minor Project

Total Theory Periods: nil

Total Marks in End Semester Exam: 100

Minimum no. Of Class test to be conducted:--

Branch: Common to all Branches

Code: 322724 (22)

Total Tutorial Period: 60

Allocation of project:

1. Information regarding broad area must be made available to the students well in advance (may be during previous semester).
2. Information must cover following parameters.
 - i. **Broad area:** Subject or expertise/application area.
 - ii. **Required skills:** Knowledge of subject(s), software, tools & other characteristics.
 - iii. **Type of project:** Hardware, software, design, survey, study based etc.
 - iv. **Guide available:** Name of Guide (S) from Department & Institute.
 - v. **Other related information** depending upon specific branch & institute.
3. It is also recommended to give proper counseling to pick up suitable project.
4. Students must get chance to select projects as per their choice or decided mutually between students and department faculty (HoD) concern.
5. One project group must contain maximum four students.

Monitoring of project:

1. It is recommended to give projects as per the specializations of existing faculty of the department instead of outside person/agency.
2. Project must be allocated, developed and monitored by department / institution itself, but not by outside agencies.
3. Regular review by guide is recommended to ensure development & contribution of students.

Internal Evaluation & Submission of project:

1. Evaluation of project would be as per the examination scheme of the University, which is based on internal as well as external evaluation.
2. Internal assessment requires submission of project report for getting approved by the concern authority. However printing and binding would be as per the conventional format.
3. Evaluation will be based on Live demonstration / presentation and Viva.
4. Final submission of project is expected as,
 - i. One copy to the Institution central library,
 - ii. One copy to the department.

External Evaluation:

External assessment of project would be like conduction of practical exams of University, and must be executed as per the norms of practical exams.

NOTE: Completion of Project outside the department/Institution should not be encouraged.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: VII

Branch: Common to all Branches

Subject: Innovative and Entrepreneurial Skills

Code: 300725 (36)

Total Theory Periods: 28

Total Tutorial Period: NIL

Total Marks in End Semester Exam: 40

Minimum no. Of Class test to be conducted:--

Unit I

Innovation: innovation- an abstract concept; creativity, innovation and imagination; types of innovation -classified according to products, processes or business organizations.

Unit II

Entrepreneurship: who is an entrepreneur? Entrepreneurship- A state of Mind, Emergence of entrepreneur; Role of Entrepreneur; A Doer not a Dreamer- Characteristics of an entrepreneur; Factors affecting entrepreneurial growth – Social, cultural, personality factors, psychological and Social Factors. Impact of Entrepreneurship for sustainable development.

Unit III

Difference between entrepreneur and entrepreneurship, Difference between entrepreneur and intra-preneur, Common Entrepreneurial competencies/Traits; Entrepreneurship stimulants, Obstacles inhibiting Entrepreneurship; Types of entrepreneurs, Functions of an entrepreneur.

Unit IV

Identification of Business Opportunities: Introduction, Sources of Business of Product Ideas, Steps in Identification of Business opportunity and its SWOT Analysis.

UNIT-V

Techno-Economic Feasibility of the project: Introduction, Techno- Economic feasibility of the Project, Feasibility Report, Considerations while preparing a Feasibility Report, Proforma of Feasibility Report, Role of Institutions and entrepreneurship.

Text and Reference Books:

1. Competing through Innovation-Bellon & Whittington, Prentice Hall of India
2. A Guide to Entrepreneurship – David Oates- JAICO Publishing House.
3. Entrepreneurship- Rober D Hisrich, Peters, Shepherd- TMH
4. Entrepreneurship in Action- Coulter, Prentice Hall of India
5. Entrepreneurship Management and Development – Ajith Kumar, HPH
6. Fundamentals of entrepreneurship- Mohanty, PHI
7. Patterns of Entrepreneurship- Jack M Kaplan, Wiley, student Edition.