

Chhattisgarh Swami Vivekanand Technical University, Bhilai

SCHEME OF TEACHING & EXAMINATION

FIFTH SEMESTER MCA

S.NO	Board of Study	Subject code	SUBJECT	Period /Week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory/ Practical				
							ESC	CT	TA		
1	Computer Applications	521511(21)	Advance Programming in Java	4	1	0	100	20	20	140	5
2	Computer Applications	521512(21)	Computer Graphics and Multimedia	4	1	0	100	20	20	140	5
3	Computer Applications	521513(21)	Software Engineering	4	1	0	100	20	20	140	5
4	Refer Table - II		Elective - II	4	1	0	100	20	20	140	5
5	Refer Table - III		Elective-III	4	1	0	100	20	20	140	5
6	Computer Applications	521521(21)	Graphics and Multimedia Lab	0	0	4	50	–	25	75	2
7	Computer Applications	521522(21)	Java Lab	0	0	4	75	–	25	100	2
8	Computer Applications	521523(21)	Project-III	0	0	5	75	–	25	100	3
9	Management	500524(36)	Managerial Skills	0	0	2	–	–	25	25	1
			TOTAL	20	5	15	700	100	200	1000	33

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

* Industrial lectures/seminars should be conducted during the fifth semester

Table II
Elective - II

S.No.	Board of Studies	Code	Subject
1	Computer Applications	521541 (21)	Data Warehousing and Mining
2	Computer Applications	521542(21)	Natural Language Processing
3	Computer Applications	521543 (21)	Cryptography & Network security
4	Computer Applications	521544(21)	Distributed Databases
5	Computer Applications	521545(21)	Robotics & Computer Vision
6	Computer Applications	521546(21)	Parallel Processing

Note (1)- 1/4th of total strength of students subject 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 examinations.

Table - III			
Elective - III			
S.No.	Board of Study	Code	Subject
1	Management	521561 (36)	Managerial Economics
2	Management	521562 (36)	Enterprise Resource Planning
3	Management	521563 (36)	Organizational Behavior
4	Management	521564 (36)	Management Information Systems
5	Applied Mathematics	521565 (14)	Reliability Engineering
6	Management	521566 (36)	Software Project Management

Note (1)- 1/4th of total strength of students subject 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 examinations.

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

Semester: **V**
Subject: **Advanced Programming In Java**
Total Theory Periods: **50**
Total Marks in End Semester Exam: **100**
Minimum no. of class tests to be conducted : **2**

Branch: **Computer Applications**
Code: **521511(21)**
Total Tutorial Periods: **12**

Unit 1: Overview of Java: Features of Java, Byte-code & JVM, data-types, Variables & Arrays, Control-statements, Introduction to Java class & object, main () function, garbage collection & finalize () method, this, Inheritance, method overriding, Dynamic method dispatching, super, final, package, Interface, Abstract class, Class path, String Class.

Unit 2: Exception and Multithreads: Exception-type, Uncaught Exception, Using try-catch, throw, throws, finally, Throwable class and object, Exception classes, Create own exception subclass. Creating multiple threads, isAlive(), join(), Thread priorities, synchronization, - Deadlock, wait(), notify(), notify All() methods, Inter-Thread Communication, suspend, resume & stop the threads.

Unit 3 : Stream and Socket : I/O classes & Interfaces, File, The Stream Classes, The Byte stream (InputStream, OutputStream, FileInputStream, File Output Stream), Serialization, Network basics, Networking classes and Interfaces, InetAddress, TCP/IP Client/Server socket, URL, URL Connection, Datagram , RMI

Unit 4 : Event handling & working with windows : Delegation event model, event classes, Event listener interface, AWT Classes, Window fundamental, AWT Controls, Layout managers, Menus, Swings:- benefits of swing over AWT , Frames panels and borders ,labels and buttons , tabbed panes , scrolling panes, split panes , combo boxes , list boxes , text component, menu, toolbar and actions , progress bars, sliders and scrollbars , dialogs .

Unit 5 : Web development ; The Applet class, Applet Architecture, Applet skeleton, HTML APPLET Tag, Passing parameter to Applet, get Document Base (), get Code Base (), Applet Context, show Document(). A simple servlet, Javax. servlet package, Reading servlet parameter, web/application server, javax.servlet.http package, using cookies, session tracking.

Text Books:

- (1) Herbert Schildt (2006), "The Complete Reference Java 2 (Updated to Cover J2SE 1.4)", Ed. 05, Tata McGraw-Hill publishing company Ltd. New Delhi, India.
- (2) Cay S. Horstmann Gary Cornell, " Core Java 2 Volume-I Fundamentals", Ed-07, PEARSON Education, Singapore Pte. Ltd., Indian Branch, New Delhi, India 2005.

Reference books:

- (1) Michael Morgan, "Java 2 for Professionals Developers", Ed. 01, SAMS, Techmedia, New Delhi, India 2000.
- (2) Bruce Echel, " Thinking in Java, The Definitive Introduction to Object-Oriented Programming in the Language of World-Wide-Web", Ed-03, PEARSON Education, Singapore Pte. Ltd., Indian Branch, New Delhi, India 2005.
- (3) Philip Heller and Simon Roberts, "Java 2 Developer's Hand Book", BPB Publication, New Delhi.

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

Semester: **V**
Subject: **Computer Graphics And Multimedia**
Total Theory Periods: **50**
Total Marks in End Semester Exam: **100**
Minimum no. of class tests to be conducted : **2**

Branch: **Computer Applications**
Code: **521512(21)**
Total Tutorial Periods: **12**

UNIT-1: Computer Graphics and output primitives: Concepts and applications, Random and Raster scan devices, Refresh Cathode ray tubes,, LCD monitors, Laser, printers, Keyboards, mouse, scanners, Graphics software Output primitives: Line drawing algorithm : DDA along with Bresenhan's. Circle generating algorithm, Midpoint algorithms: ellipse and other curves. Attributes of output primitive. Antialiasing, Area filling: Filled area primitive: Scan-line Polygon Fill Algorithm, boundary fill algorithm, flood fill algorithm.

UNIT-2: 2-D Transformation, viewing, Clipping: Two-dimensional Transformations: Translation, scaling, rotation, reflection, shear, matrix representation of all homogeneous coordinates, composite transformations. 2D-projections – parallel and perspective projection.

Two dimensional viewing, Viewing pipeline Window-to-view port transformation. Clipping operations. Line Clipping: Cohen Sutherland, Nicholl-lee-Nichol land Liang-barsky, Polygon Clipping

UNIT-3: 3-D transformation and Visible surface detection Three- dimensional object representations: Polygon Surface, Tables, Plane Equation. Curved lines and Surfaces: Spline representations, Interpolating and approximation curves, continuity conditions Cubic Splines, Bezier curves B-Spline curves: characteristics and generation. 3-D Transformation.

Visible Surface detection Algorithm :Object based and image based methods, depth comparison, A-Buffer, Back face removal, Scan-line method, Depth Sorting Method Area subdivision method.

UNIT-4: Overview .of multimedia, classification, basic concept of sound/audio MIDI: devices, messages, software. Speech, Video and Animation: Basic concept, computer-based animation, methods of controlling animation, display of animation, and tranmission of animation.

UNIT-5: Data compression: storage space, coding requirements. Source, entropy and hybrid coding some basic compression technique: runlength code, Huffman code. JPEG :Image preparation, Lossy sequential DCT –based mode, expanded Lossy DCT based mode, Lossless mode, hierarchical mode. MPEG, Huffman Encoding, LZW compression,

Text Books: 1 *Computer Graphics by Donald Hearn & M. Pauline Baker PHI*
2. *Multimedia Computing communication& applications "By Ralf Steimnety & Kerla Neshtudt. Prince Hall.*

Reference Books:
1 *Principles of interactive compo Graphics; W.M. Newman & Robert F Sproull.*
2 *Computer Graphics By Rogers TMH*
3 *Introductions to Computer Graphics Anirban Mukhopadhyay &Arup Chattopadhyay*
4 *Schaum's outlines -computer Graphics Mc Graw Hill International Edition.5*
5.*Principles of Multimedia by Ranjan Parekh TMH*
6. *"Multimedia Systems Design", P. K.Andleigh & K. Thakrar, Prentice Hall Pvt. Ltd.*

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

Semester: **V**

Subject: **Software Engineering**

Total Theory Periods: **50**

Total Marks in End Semester Exam: **100**

Minimum no. of class tests to be conducted : **2**

Branch: **Computer Applications**

Code: **521513(21)**

Total Tutorial Periods: **12**

UNIT-1: Introduction: The software and software engineering problem, approach and goals of Software engineering. **Software Processes and Models:** Processes, projects and products, component software processes, characteristics of a software process, software development process, project management process, software configuration management process. Models: Linear sequential, prototyping, RAD, incremental, spiral, WINWIN spiral, concurrent development model

UNIT-2: Software requirement Analysis and Specification: Software requirement, need for SRS, characteristics and component of SRS, specification languages. Requirement analysis, formal & informal approach, structured analysis, object oriented modeling, Structure of a requirement document, validation of SRS, requirement reviews, size measures, quality metrics.

UNIT-3: Manning a software project: Cost estimation, uncertainties in cost estimation, building cost estimation. Size estimation: - COCOMO model. Project scheduling, average duration estimation, project handling and milestones, staffing and personnel planning, Rayleigh curve, team structure, software configuration management plans, quality assurance plans, verification and validation, resources monitoring plans, risk management. **Function Oriented design:** Design principles, coupling, cohesion, design notation and specification, structured design technology, verification, network metrics, stability metrics, information flow metrics.

UNIT-4: Software Testing techniques and strategies: Software testing objectives & principles, test case design, white box testing, black box testing.: A Strategic Approach to software testing, strategic issues, unit integration testing validation testing system testing, the art of debugging.

UNIT-5: Software Re-engineering: Software reengineering, software maintenance, a software reengineering process model, reverse engineering, restructuring code, data restructuring, forward engineering, the economics of reengineering.

Computer Aided software Engineering: What is CASE, building blocks for CASE, taxonomy of CASE tools, integrated CASE environment, the integration architecture, the case repository. **Component Based Software Engineering:** CBSE process, domain engineering, Component based development, economics of CBSE.

Text Book:

1. *Pressman Roger, Software Engineering: A Practitioner's Approach TMH, Delhi.*
2. *Jalote Pankaj: An Integrated Approach to software Engineering, Narosa, Delhi.*

Reference

1. *R.E. Fairly, Software Engineering Concepts, Me Graw Hill, Inc 1985.*
2. *Poyce, software Project Management, Addison Wesley.*

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

Semester: **V**

Subject: **Managerial Economics**

Total Theory Periods: **50**

Total Marks in End Semester Exam: **100**

Minimum no. of class tests to be conducted : **2**

Branch: **Computer Applications**

Code: **521561(36)**

Total Tutorial Periods: **12**

UNIT-1: Introduction: Nature, concept and scope of managerial economics. Objectives of the firm, Management and Behavioral theories of the firm, Role and responsibilities of Managerial Economist.

UNIT-2: Demand and Cost analysis: Cost Concepts, Law and nature of demand, demand determinants, elasticity of demand, methods of demand forecasting, Product and cost analysis: short run and long run average cost curves.

UNIT-3: Law of Returns and Production functions. Law of supply. Economies and diseconomies of scale, law of variable proportions

UNIT-4: Pricing: prescriptive approach, Price determination under perfect competition, Monopoly, oligopoly and monopolistic competition, Non price competition, price discrimination, price differentiation, Full cost pricing, Product strategies.

UNIT-5: Profits: Nature and measurement policy. Theories of profit, Business fluctuations and trade cycles, Break-even analysis, Input-output analysis, Social cost benefit analysis, Case study.

Text Books:

1. Mehta P.L., "Managerial Economics- Analysis, Problems and cases", Sultan Chand and Sons, New Delhi.
2. K.L.Maheshwari, R.L.Varshney : " Managerial Economics", S.Chand

References:

1. Dwivedi D.N., "Managerial Economics" Vikas publications, Edition 6.
 2. Dean J "Management economics " Prentice Hall of India, New Delhi, 1982
- Mote. V.I. " Management economics " concepts and cases" Tata McGraw Hill. New Delhi 1980

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

Semester: **V**
Subject: **Enterprise Resource Planning**
Total Theory Periods: **50**
Total Marks in End Semester Exam: **100**
Minimum no. of class tests to be conducted : **2**

Branch: **Computer Applications**
Code: **521562(36)**
Total Tutorial Periods: **12**

UNIT-1: Conceptual foundation of Business Process reengineering: Role of information Technology and BPR; Process improvement and Process redesign, Process identification and mapping; Role/Activity diagrams, Process Visioning, and benchmarking.

UNIT 2: Enterprise Resource Planning: Evolution of ERP- MRP and MRP II, structure of ERP- two tier architecture, three tier architecture, Electronic data processing, management information system, Executive information system, ERP as an integrator of information needs at various Levels.

UNIT 3: Typical Business Processes: Core processes, Product control, Sales order processing, Purchases, Administrative processes, Human resource, Finance support processes, Marketing, Strategic planning, Research and development, Problems in traditional view.

UNIT 4: ERP models / functionality: Sales order processing, Production scheduling, forecasting, distribution, finance, features of each of the models, description of data flow across each module, overview of supporting databases.

UNIT 5: ERP implementation issues: Opportunities and problems in ERP selection, and implementation; ERP implementation: identifying ERP benefits, team formation, Consultant intervention, Selection of ERP, Process of ERP.

Text Books:

1. *ERP, Concepts and Practices*, V.K. GARG & N .K. VENKATKRISHNAN:, pm
2. *Enterprise wide Resource Planning-theory and practice*, Rahul V. Altekar, PHI

References:

1. *ALEXIS LEON: Enterprise Resource Planning*, TMH
2. *S. SADAGOPAN: MIS*, pm
3. *V. RAJARAMAN: Analysis and Design of Information Systems*, PHI
4. *MONK' & BRADY: Concepts in ERP*, Vikas pub, Thomson

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

Semester: **V**

Subject: **Organizational Behavior**

Total Theory Periods: **50**

Total Marks in End Semester Exam: **100**

Minimum no. of class tests to be conducted : **2**

Branch: **Computer Applications**

Code: **521563 (36)**

Total Tutorial Periods: **12**

UNIT 1: Introduction: Introduction to Organizations and individuals. What is an Organization, components of Organization, nature and variety of organizations (in terms of objectives, structure etc), models of Analyzing Organization Phenomena (Hawthorne Experiments), organizational and business variables.

UNIT 2: Individual Dimension On OB: Organization in Indian Context, institutions and structures, basic roles in an organization, Perception, Attitude, values, Motives (achievement, power, affiliations), commitment, creativity, emotions, Learning, Stress and other personality factors, s Profile of a Manager and an entrepreneurs.

UNIT 3: Interpersonal and Group Processes: Interpersonal trust, understanding the person from his/her point of view, Interpersonal Communication, listening, feedback, counseling, transactional analysis, self-fulfilling prophecies.

UNIT 4: Understanding Work Teams: Leadership, motivating people, working as a member of a team, team functioning, team decision-making, team conflict resolution, team problem solving.

UNIT 5: Organization Structure: Elements of structure, functions and days functionalities of structure, determinants of structures, structure-technology-people-environment relationship, principles underlying the design of organizations. Organization Culture, Power and Politics, Organization Change. Case studies.

Text Book:

1. *Robbins (4th ed), "Essentials of Organizational Behavior", PHIs*
2. *L.M Prasad ' Organizational Behaviour' Sultan Chand & Sons*

References:

1. *Dwivedi R.S. 'Human Relations and Organizational Behavior: A global perspective' MacMuillan India ltd. Delhi*
2. *French and bell 4th edition ' Organization Development: Behavioral Science Inventions for Organization Improvement' PHI*
3. *Stephens P. Robbins ' Organizational behavior' PHI*

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

Semester: **V**
Subject: **Management Information Systems**
Total Theory Periods: **50**
Total Marks in End Semester Exam: **100**
Minimum no. of class tests to be conducted : **2**

Branch: **Computer Applications**
Code: **521564 (36)**
Total Tutorial Periods: **12**

- UNIT 1: Introduction:** Introduction to MIS, definition, Role, impact, subsystems of MIS, structure of MIS, MIS and computer, Executive information system, Transaction processing, Office Automation and information processing control functions.
- UNIT 2: Conceptual Foundations:** Decision making concept, method, tools, procedures, MIS and Decision making, Concept of information- mathematical definition, classification, methods of collection, value, age of information, Human as an information processor.
- UNIT 3: Systems, Planning and Control:** System concept – definition, General model of system, types, subsystems, preventing system entropy, system stress and system change, system concept applied to MIS. Concept of planning and control-concept of planning, planning process, computational support for planning, characteristics of control,
- UNIT 4: DSS and Expert Systems:** Concept and philosophy, characteristics, structure of decision making, classes of DSS, users of DSS, support for decision making process, AI systems, Knowledge based Expert systems, semantic networks, MIS and role of DSS
- UNIT 5: Development and Implementation:** Development of long range plans, ascertaining the class of information, determining the information requirement, Development and implementation of MIS, management of quality in MIS, organization for development of MIS, factors of success and failure of MIS

Text Book:

1. *Godon B. Davis & Margrethe H. Olson (2nd ed), "Management Information Systems", TMH*
2. *W.S. Jawadekar 'Management Information Systems' TMH*

References:

1. *S. Sadagopan 'Management Information Systems' PHI*
2. *Jerome Kanter (4th edition) 'Managing with Information' PHI*
3. *James A. Senn 'Analysis and Design of Information systems' MC Graw-Hill, International Edition*

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

Semester: **V**

Subject: **Reliability Engineering**

Total Theory Periods: **50**

Total Marks in End Semester Exam: **100**

Minimum no. of class tests to be conducted : **2**

Branch: **Computer Applications**

Code: **521565(14)**

Total Tutorial Periods: **12**

UNIT 1: Reliability definition: Introduction, definition of Reliability. Failure data analysis: Introduction Failure data, Mean Failure Rate h , Mean Time to Failure (MTTF), Mean Time between Failures (MTBF), Graphical Plots, Four Important Points, MTTF in Terms of Failure Density, Generalization, Reliability in terms of Hazard Rate and Failure Density (in Integral Form), Mean Time to Failure in Integral Form, Reliability in other Situations.

UNIT 2: Hazard Models: Introduction, Constant Hazard, Linearly-Increasing Hazard, The Weibull Model, On density Function and Distribution Function, Distribution Function and Reliability Analysis, Some important Distributions, Choice of Distribution, Expected Value, Standard Deviation and Variance, System of Random Variables and Their Functions, Function of a Single Random Variable.

UNIT3: System Reliability: Introduction, Series Configuration, Parallel Configuration, Mixed Configurations, Application to Specific Hazard Models, An r-out-of-n Structure, Methods of Solving Complex Systems, Systems not Reducible to Mixed Configurations, Mean Time to Failure of Systems, Logic Diagrams, Markov Models, Markov Graphs, Systems Subjected to Probability Laws. Reliability Improvement: Introduction, Improvement of Components, Redundancy, Element Redundancy, Unit Redundancy, Standby Redundancy, Optimization, Reliability-Cost trade-Off.

UNIT 4: Fault-tree analysis and other Techniques: Fault-Tree analysis: Introduction, Fault-Tree Construction, Calculation of Reliability from Fault Tree, Event-Tree Analysis. Tie-Set and Cut-Set: Introduction and methods, Use of Boolean Algebra: Introduction, Basic Operations, Truth Tables, De Morgan's theorem, Application to Reliability Analysis, Probability Calculations.

UNIT 5: Maintainability and Availability: Introduction, Maintainability, Availability (Qualitative aspects), System own time, Availability, Reliability and Maintainability Trade-Off. Repairability Systems: Introduction, Instantaneous Repair rate, Mean Time to Repair (MTTR), Reliability and Availability Functions. Reliability Allocation: introduction, reliability Allocation for a Series System.

Text Books:

1. *Reliability engg*, L.S.Shrinath, Affiliated east west pvt limited
2. *Reliability & Maintainability*, Charles Ebeling, TMH

References:

1. *Reliability engg*, Balaguruswamy, TMH
2. *Basic Reliability & Introduction to Reliability engg*, Nicholas, Summerville publishers
3. *Reliability engg*, Von Alver, William, PHI
4. *Mathematical models for reliability*, A.Kaufmann, PHI

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

Semester: **V**
Subject: **Software Project Management**
Total Theory Periods: 50
Total Marks in End Semester Exam: **100**
Minimum no. Of class tests to be conducted: **2**

Branch: **Computer Applications**
Code: **521566(36)**
Total Tutorial Periods: **12**

UNIT 1: Introduction to project Management: Working of a traditional organization, characteristics of a PROJECT, their aspects, management functions and their viewpoints, Project management and its functional nature, Roots of PM, its goals, Type of project managers, job functions of project manager.

UNIT 2: Project Management Process: Project processes, its dimensions, project boundaries, Grouping of PM processes. Project management interactions, Project scope managements and its process flow, Project time managements and its process flow, Project cost managements and its process flow, Project quality managements and its process flow, RISK management process and its process flow, HR management process and its process flow, Project communication management and process flow

UNIT 3: Pre-Project Scenario: Service-level agreement, its key concepts, its benefits, feasibility study, feasibility and requirements, need for engineering economies analysis, types of costs and benefits, need of project estimation & problems. Productivity, Decompositioning and estimation, Resource considerations after system study.
Project Initiation: Purpose, activities of Project initiation, Project charter, is address & others. Enterprise environmental factors. **Project Planning:** Project management plan, contents of project plan, process work breakdown structure (WBS). Activity resource estimating process. HR planning, staff management plan, Quality planning, Communication planning, Risk Management planning, Procurement management plans.

UNIT 4: Project Execution: Project plan execution, its responsibilities, process Group, execution, need of quality assurance, quality audits, type of audits, **Project Team:** Resource leveling, negotiations, using external resources, team in PM & their troubles, effective project teams, Training & Development, Recognition & Rewards, performance improvement, advertising, conferences, proposal, contracts & its types, Information distribution, communication skills.

UNIT 5: Project Monitoring & Control: Project control, relationship between planning and control, role of monitoring in PC, project control process, monitoring project work, schedule control process, cost control process, quality control process, Managing project teams, reporting and reviews, types of project evaluation, Project actioning, Risk monitoring & control, contract administration.
Project closing & Beyond: closing process group, project process, close project contract closeout, project success, project failure, Implementation process, Training for implementation.

Text Books:

1. *Information Technology Project Management, S.A. Kelkar, PHI*
2. *The art of project management, Berkun, Shroff publishers*

References: *Quantitative methods in project management, Shroff publishers*

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

Semester: **V**

Subject: **Data Warehousing And Mining**

Total Theory Periods: **50**

Total Marks in End Semester Exam: **100**

Minimum no. of class tests to be conducted : **2**

Branch: **Computer Applications**

Code: **521541(21)**

Total Tutorial Periods: **12**

UNIT 1: Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining, Data Warehouse and OLAP Technology for Data Mining, Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology From Data Warehousing to Data Mining,

UNIT 2: Data Preprocessing & Data Mining Primitives, Languages, and System Architectures: Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation, Online Data Storage. Data Mining Primitives, Data Mining Query Languages, Designing Graphical User Interfaces Based on a Data Mining Query Language Architectures of Data Mining Systems

Concepts Description: Characterization and Comparison: Data Generalization and Summarization-Based Characterization, Analytical Characterization: Analysis of Attribute Relevance, Mining Class Comparisons: Discriminating between Different Classes, Mining Descriptive Statistical Measures in Large Databases.

UNIT 3: Mining Association Rules in Large Databases: Association Rule Mining, Mining Single-Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Back propagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, Classifier Accuracy.

UNIT4: Cluster Analysis Introduction: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.

UNIT5: Mining Complex Types of Data: Multidimensional Analysis and Descriptive Mining of Complex, Data Objects, Mining Spatial Databases, Mining Multimedia Databases, Mining Time-Series and Sequence Data, Mining Text Databases, Mining the World Wide Web.

Text Books:

1. *Data Mining – Concepts and Techniques* - JIAWEI HAN & MICHELINE KAMBER *Harcourt India.*
2. *Data Mining Techniques* – ARUN K PUJARI, *University Press*
3. *Building the Data Warehouse-* W. H. Inmon, *Wiley Dreamtech India Pvt. Ltd..*

Reference Books:

1. *Data Warehousing in the Real World* – SAM ANAHORY & DENNIS MURRAY. *Pearson Edn Asia.*
2. *Data Warehousing Fundamentals* – PAULRAJ PONNAIAH *WILEY STUDENT EDITION*
3. *The Data Warehouse Life cycle Tool kit* – RALPH KIMBALL *WILEY STUDENT EDITION*
4. *Data Mining Introductory and advanced topics* –MARGARET H DUNHAM, *PEARSON EDUCATION*

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

Semester: **V**
Subject: **Natural Language Processing**
Total Theory Periods: **50**
Total Marks in End Semester Exam: **100**
Minimum no. of class tests to be conducted : **2**

Branch: **Computer Applications**
Code: **521542 (21)**
Total Tutorial Periods: **12**

UNIT 1: Grammars and Parsing: Grammar and sentence structure, good grammar, top-down and bottom-up chart parser, transition network grammars, finite state models and morphological processing, grammar and logic programming.

UNIT 2: Features and unification: Human preferences in parsing, encoding uncertainty: shift-Reduce Parsers, A deterministic Parser, Techniques for efficient encoding of biguity, semantics and logical form, word senses and ambiguity, partial parsing, feature stems and augmented grammars, some basic feature systems for English, morphological analysis and the lexicon, parsing with features, augmented transition networks, definite clause grammars, generalized feature systems and unification grammars.

UNIT 3: Linking syntax and semantics: Semantics and logical form, word senses and ambiguity, the basic logical form language, encoding ambiguity in the logical form, verbs and states in logical form, thematic roles, speech acts and embedded sentences, defining semantic structure: Model theory, semantic interpretation and compositionality, a simple grammar and lexicon with semantic interpretation, prepositional phrases and verb phrases, lexicalized semantic interpretation and semantic roles. Semantics interpretation using feature unification, generating sentences from logical form.

UNIT 4:Strategies for Semantic Interpretation: Selection restrictions, semantic filtering using selection restrictions, semantic networks, statistical word sense disambiguation, statistical semantic preferences, combining approaches to disambiguation, grammatical relations, semantic grammars, template matching, semantically driven parsing techniques, scooping phenomena, descriptions and scooping, scooping with parsing, co-reference and binding constraints, adjective phrases, relational nouns and nominalizations.

UNIT 5:Natural language generation and translation: Introduction to language generation, architecture for generation, surface realization, systemic grammar, functional unification grammar, discourse planning, text schemata, rhetorical relations, micro planning, lexical selection, evolution generation stems, generating speech, language similarities and differences, the transfer metaphor, syntactic transformations, lexical transfer, the interlingua idea, direct translation, statistical techniques, quantifying fluency, quantifying faithfulness, usability and system development

Text Books:

1. *Speech and Language Processing, Daniel Jurafsky & James H.Martin, LPE, Pearson Education.*
2. *Natural Language Understanding, James Allen, 2nd edition, Pearson Education.*

Reference Books:

- 1 *Natural language processing in prolog, G.Gazder, Benjamin/cunnings*

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

Semester: **V**

Subject: **Cryptography And Network Security**

Total Theory Periods: **50**

Total Marks in End Semester Exam: **100**

Minimum no. of class tests to be conducted : **2**

Branch: **Computer Applications**

Code: **521543 (21)**

Total Tutorial Periods: **12**

UNIT 1: Foundation of Cryptography and Security:-The OSI Security Architecture , A model for network Security ,Symmetric cipher model Substitution techniques Mathematical Tools for Cryptography: Permutations, Modular Arithmetic, Euclid's Algorithm, Finite Fields, Polynomial Arithmetic. Design Principle of Block ciphers: Theory of Block Cipher Design, Feistel ciphers. Cipher Network Structures, DES and Triple DES, Strength Of DES, Modes of Operation (ECB, CBC, OFB, CFB),.

UNIT 2: Block Cipher Algorithms:-IDEA, CAST, Blowfish, Two fish, AES, Pseudo Random Numbers and stream ciphers: pseudo random sequences, Linear Congruencies Generators, Cryptographic Generators, Design of Stream Cipher, RC4, RC5.

UNIT 3: Public Key Cryptography:- Prime Numbers and Testing for Primality, Factoring Large Numbers, Discrete Logarithms Principles of public key Cryptosystems RSA, Key Management Diffie- Hellman, key exchange, Introduction of Elliptic curve arithmetic, Key Exchange Algorithms, Public –Key Cryptography Standards. Hashes and Message Digests: Message Authentication codes, MD5, SHA-1, RIPEMD, HMAC.

UNIT 4: 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 5: System Security: Computer Virus, Firewall and Design Principles,:. Electronic Commerce Security: Electronic Payment Systems, Secure Electronic Transaction (SET), Protocols (CyberCash, iKey) Ecash (DigiCash), Smart Card Based Systems.

Text Books

(1) *Cryptography and Network Security, William Stalling, PHI.*

(2) *Applied Cryptography: Protocols & Algorithms, Schneier & Bruce, MGH International.*

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

Semester: V

Subject: **Distributed Databases**

Total Theory Periods: **50**

Total Marks in End Semester Exam: **100**

Minimum no. of class tests to be conducted : **2**

Branch: **Computer Applications**

Code: **521544 (21)**

Total Tutorial Periods: **12**

UNIT-1: Introduction; Distributed Data Processing, Distributed Database System, Promises of DDBS, Problem areas. Distributed DBMS Architecture: Transparencies in a Distributed DBMS, - DBMS Standardization, Architectural Models for Distributed DBMS, DDMBS Architecture. Distributed Database Design: Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation.

UNIT 2: Query Processing and decomposition: Query Processing Problem, Query Processing Objectives, Characterization of query processors, layers of query processing, query decomposition, Localization of distributed data. **Distributed query Optimization:** Inputs to Query Optimization, centralized query optimization, Join Ordering in Fragment Queries Distributed query optimization algorithms.

UNIT 3: Transaction Management: Definition, properties of transaction, types of transactions. Distributed concurrency control: Serializability, concurrency control Mechanisms & Algorithms, Locking-based Concurrency Control Algorithms Time stamped & Optimistic concurrency control Algorithms, Deadlock Management.

UNIT 4: Distributed DBMS Reliability: Reliability concepts and Measures, fault-tolerance in Distributed systems, failures in Distributed DBMS, local & Distributed Reliability Protocols, site failures and Network partitioning. Architectural Considerations **Parallel Database Systems:** Database Series, Parallel Architecture, Parallel DBMS Techniques, Parallel exception problems, Parallel Execution for Hierarchical architecture.

UNIT 5: Distributed object Database Management Systems: Fundamental object concepts and Models, Object Distributed Design, Architectural Issues, Object Management, Distributed Object storage, Object query Processing.

Text Books:

1. *M.Tamer OZSU and Patuck Valduriez: Principles of Distributed Database Systems, Pearson Edn. Asia, 2001.*
2. *Stefano Ceri and Willipse Pelagatti: Distributed Databases, McGraw Hill.*

Reference Books:

1. *Henry F Korth, A Silberchatz and Sudershan: Database System Concepts, MGH*
2. *Raghuramakrishnan and Johhanes Gehrke: Database Management Systems, MGH*
3. *Data Mining introductory and advanced topics – MARGARET H DUNHAM, PEARSON EDUCATION*

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

Semester: V
Subject: **Robotics And Computer Vision**
Total Theory Periods: **50**
Total Marks in End Semester Exam: **100**
Minimum no. of class tests to be conducted: **2**

Branch: **Computer Applications**
Code: **521545 (21)**
Total Tutorial Periods: **12**

UNIT 1: From Teleoperation To Autonomy: What can Robots be used for? A brief history of Robotics, Teleoperation, attributes of the hierarchical paradigm, closed world assumption and the frame problem, representative architectures.

UNIT2: The reactive Paradigm: Reflexive behaviors, innate releasing mechanisms, perception in behaviors, behaviors and schema theory, characteristics and connotations of reactive behaviors, subsumption summary, potential fields methodologies, steps in designing a reactive behavioral system.

UNIT 3: Projection: Pinhole cameras, cameras with lenses, the human eye, sensing, least – squares parameter estimation, a linear approach to camera calibration, taking radial distortion into account, the physics of color, human color perception, representing color, a model for image color.

UNIT 4: Stereo Vision: Two views, epipolar geometry, the calibrated case, small motions, the uncalibrated case, weak calibration, three views, image rectification, human stereopsis, correlation, affine structure and motion from two images.

UNIT 5: Image Structure: Obtaining hypotheses, pose consistency for perspective cameras, affine and projective camera models, obtaining hypotheses by pose clustering, obtaining hypotheses by using invariants, edge proximity, elements of differential geometry, contour geometry, computing the aspect graph, aspect graphs and object localization

Text Books:

1. *Introduction to AI Robotics by Robin Murphy, PHI*
2. *Computer Vision: A Modern Approach by Forsyth and Ponce, Pearson Education, LPE.*

Reference Books:

1. *J. Latombe, Robot Motion Planning*
2. *O. Faugeras, Three Dimensional Computer Vision, MIT Press*
3. *Nalwa V.S., A guided tour of computer vision*

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

Semester: B.E. V

Subject: **Parallel Processing**

Total Theory Periods: **50**

Total Marks in End Semester Exam: **100**

Minimum no. of class tests to be conducted : **2**

Branch: **Computer Applications**

Code: **521546 (21)**

Total Tutorial Periods: **12**

Unit – I

Introduction to parallel processing: Trends towards parallel processing;

Parallelism in Uniprocessor systems: Basic Uniprocessor Architecture, Parallel Processing mechanisms, Multiprogramming and Time Sharing;

Parallel Computer Structures: Pipeline computers, Array computers, Multiprocessor systems, Performance of Parallel Computers;

Architectural classification schemes; Parallel processing applications.

Unit-II

Principles of Pipelining and Vector Processing: Principles of Linear Pipelining, Classification of Pipelined processors, General pipelines & Reservation tables, Instruction and Arithmetic Pipelines: Design examples and principles of design,

Vector Processing: characteristics, Multiple Vector Task Dispatching, Pipelined Vector Processing methods. Architecture of Cray-I.

Unit – III

Structure of Array Processors- SIMD Array Processors: Organizations, Masking and Data Routing Mechanisms; SIMD Interconnection Networks: Static, Dynamic, Mesh-Connected, Cube Interconnection Networks, Shuffle Exchange, Omega Networks; Performance Enhancement methods; Associative Array processing: Associative Memory Organization, Associative Processors.

Unit – IV

Multiprocessor Architecture: Functional Structures – Loosely Coupled and Tightly coupled multiprocessors; Interconnection Networks for multiprocessors: Crossbar Switch and multiport memories, Multistage Networks for multiprocessors; Exploiting Concurrency for multiprocessors, Parallel Memory Organizations: High order & Low order interleaved memory; Scheduling strategies, Interprocess communication mechanisms: Process Synchronization Mechanisms, Synchronization with Semaphores, Home Memory and PHIN concept.

Unit – V

Algorithms on Array processors; Parallel Algorithms on Array Processors- SIMD Matrix Multiplication, Parallel Sorting on Array Processors, SIMD Fast Fourier Transform, Parallel Algorithms of Multiprocessors- Classification of Parallel Algorithms, Synchronized Parallel Algorithms, Asynchronous Parallel Algorithms, Performance of Parallel Algorithms.

TEXT BOOK:

- 1) Computer Architecture & parallel Processing- Kai Hwang & A. Briggs (McGraw Hill)
- 2) Designing Efficient Algorithms for Parallel Computers – H.J. Quinns (McGraw- Hill)

REFERENCE BOOK:

- 1). Advanced Computer Architecture: parallelism, Scalability, Programmability- By:- Kai Hwang (TMH)
- 2). Computer Organization & Programming – By – Gear (TMH)
- 3). Parallel Processing for Supercomputers & Artificial Intelligence – By – Hwang & Degroot (TMH)

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

Semester: **V**
Subject: **Graphics & Multimedia Lab**
Total Practical Periods: **50**
Total Marks in End Semester Exam: **50**

Branch: **Computer Applications**
Practical Code: **521521(21)**

Experiments to be performed:

- (i) Write a program to draw a Line Using DDA algorithm.
- (ii) Write a program to draw a Line Using Bresanham's algorithm.
- (iii) Write a program to draw polygon (Triangle, square, pentagon etc).
- (iv) Write a program to draw Circle/Ellips using Mid Point Circle algorithm.
- (v) Write a program to implement Area filling using Scan Line Method.
- (vi) Write a program to implement Boundary fill 4-connected / 8-connected Algorithm using Recursion/Non Recursion.
- (vii) Write a program to implement Flood fill Algorithm using Recursion/ Non Recursion. OR Write a program to Fill a solid colored area./ Write a program to Fill a Multicolor Boundary area.
- (viii) Write a program to Translate a Line/Polygon.
- (ix) Write a program to Rotate and Scaling of a Line/Polygon With respect to
 - i) Origin
 - ii) Pivot Rotation
- (x) Write a program to perform Shearing of Polygon with respect to
 - i) X-axes
 - ii) Y-axes
- (xi) Write a program to perform reflection of polygon with respect to
 - i) X-axes
 - ii) Y-axes
 - iii) With respect to origin
 - iv) With respect to line $Y=X$
 - v) With respect to line $Y=mX+C$
- (xii) Draw Bazier curve using Local Control Point (60,20),(80,100),(150,90),(180,50).
- (xiii) Write a program to perform Clipping of Line using Cohen Sutherland Algorithm.
- (xiv) Prepare a game using graphics basic object and various transformations.

OR

Create a Paint Brush Like Application that include facility to draw all the basic object.

OR

Develop any useful tool (like watch) using graphics basic object and various transformations.
- (xv) Implementation of text compression using dynamic Huffman coding/ static Huffman coding

List of Equipments/Machine required:

- (i) PC with Windows XP
- (ii) Turbo C/C++ compiler

Recommended Books:

- (i) *Graphics and programming in C* Rogers T , Stevens BPB
- (ii) *Graphics under C* by Yashwant Karnetkar BPB

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

Semester: **V**
Subject: **JAVA LAB**

Branch: **Computer Applications**
Practical Code: **521522(21)**

Total Practical Periods: **50**

Total Marks in End Semester Exam: **75**

Experiments to be performed:

- (i) Write a program to create a class called **PassObjectDemo** with two variables **a** and **b** of type integer and method with following prototype-

Pass Object Demo get Parameter To Sum (Pass Object Demo p, Pass Object Demo q)

Which will accept two parameter of object of same class to add the individual member variable **a** and **b** of both the objects and returns the same class object in the called area. Store this returned object in the called area and display the value of variables of this object by using **void getDisplay()** method.

[Passing object as a parameters and returning object]

- (ii) Create two classes called **A** and **B**. The class has two variables **a**, **b** and two function **void getData()**, **void getSum()**. Similarly class **B** has two variables **c**, **d** and two methods **void getData()**, **void getSum()**. Now pass reference of class **A** into **B**, and reference of class **B** into class **A** to access members.

[Note: Program for two way communication within the classes]

- (iii) Write a program to create two classes called **A** and **B**. Class **A** has two variables **'a'** and **'b'** with two methods **void getData()** used to get values of **'a'** and **'b'** and **void getDisplay()** used to display the sum of relevant variables. Similarly class **B** has two variables **'c'** and **'d'** of type integer with two functions **void getData()** used to get values of **'c'** and **'d'** and **void getDiv()** used to divide corresponding variables. Extend **A** by **B** and call methods of **B** in the class **A** by **dynamically**. Use **super()** to call constructor of **B** if require.

[Use of super]

- (iv) Write a program to generate own exception class called **MyException** used to generate exception during **execution**. Create **ExceptionDemo** class; inside this define one method named **void getAge (int a)** which will **throws MyException** if negative age is entered. Create another class **UsingMyException** used to call this method with an integer parameter for age.

- (v) Write a program to define a method called **void call ()** in class **CallMe**. Create another class **Caller** which implements **Runnable** interface, to create multiple threads. These threads will call **void call ()** method of **CallMe** class synchronously by using **synchronized block or synchronized statement**. Create another class **Synch** in which **main ()** method will start execution of these threads as chilled threads.

[Synchronization]

- (vi) Write a program to demonstrate **Inter-thread communication** for two threads consider thread 1 generating one integer number & thread 2 accepting it via two methods **wait ()** and **notify ()**.

- (vii) Write a program to create I / O stream to read and write content of disc file
- (viii) Write a program to create Client/Server socket to establish communication in bi-directional.
- (ix) Write a program to create URL connection to current find out status of a web site
- (x) Write a program to show all the AWT Components of the Java.
- (xi) Write a program to show all the Swing Components of the Java.
- (xii) Write a program to demonstrate Swing/AWT components with its corresponding event and Listener interfaces, event registration, and called relevant event methods.
- (xiii) Create an Applet for accepting parameters through **getParameter()** method of Applet class which is coming from **param** tag of relevant **HTML** file and display the gathered parameter through **public void paint(Graphics g) method** in the Applet. Also find out the location of applet & path by using **getDocumentBase(), getCodeBase()** methods of **Applet** class. And also use Applet Context interface and showDocument() method to context another applet.
- (xiv) Write a program to create simple servlet and deploy by using tomcat server.
- (xv) Write a program to implement session tracking and cookies in the servlet.

List of Equipments/Machine required :

- (i) Software: The Java Development Kit version 1.3 (JDK 1.3 or more) and Java Servlets Development Kit.
- (ii) Operating System: Win32 Release for Windows 98 and Windows NT on Intel hardware. For Windows NT, only version 4.0 is supported.
- (iii) RAM / Processor: A 486/DX or faster processor and at least 64 megabytes of RAM are recommended.

Recommended Books:

- (i) *“Head First Java” by Kathy Sierra & Bert Bates O’Reilly Publication*
- (ii) *“Head First Servlets and JSP “ Bryan Basham , Kathy Sierra & Bert Bates*