Chhattisgarh Swami Vivekanand Technical University, Bhilai

NINTH SEMESTER - MASTER OF COMPUTER APPLICATIONS (INTEGRATED)

S. No	Board of Study	Subject Code	Subject	Period / week			Scheme of Exam Theory / Practical			Total Marks	Credit L+ (T+P)/2
				L	T	P	ESE	CT	TA		
1	Computer Applications	421911 (21)	Design &Analysis of Algorithms	4	1	0	80	20	20	120	5
2	Computer Applications	421912 (21)	Software Project Management	4	1	0	80	20	20	120	5
3	Computer Applications	421913 (21)	Cyber Security	4	1	0	80	20	20	120	5
4	Refer Table – IV		Elective – IV	4	1	0	80	20	20	120	5
5	Refer Table – V		Elective – V	4	1	0	80	20	20	120	5
6	Computer Applications	421921 (21)	Cyber Security Lab	0	0	4	50	-	25	75	2
7	Computer Applications	421922 (21)	Software Technology Lab(PHP)	0	0	4	50	-	25	75	2
8	Computer Applications	421923 (21)	Project-III	0	0	7	75	-	25	100	4
Total				20	5	15	575	100	175	850	33

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

Table IV: Elective – IV

S. No	Board of Studies	Subject Code	Subject
1	Computer Applications	421931 (21)	Natural Language Processing
2	Computer Applications	421932 (21)	Distributed Databases
3	Computer Applications	421933 (21)	Robotics & Computer Vision
4	Computer Applications	421934 (21)	Parallel Processing
5	Computer Applications	421935 (21)	Middleware Technologies

Table V: Elective – V

S. No	Board of Studies	Subject Code	Subject
1	Computer Applications	421941 (21)	Software Testing and Quality Assurance
2	Computer Applications	421942 (21)	Mobile Computing
3	Computer Applications	421943 (21)	Grid Computing
4	Computer Applications	421944 (21)	Virtualization and Cloud Computing
5	Computer Applications	421945 (21)	Big Data Analytics

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.

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Semester: IX   **Branch**: Computer Application
Subject: Design and Analysis of Algorithms   **Code:** 421911 (21)
Total theory periods: 40   **Total Tutorial periods**: 10
Total marks in End Semester Exam: 80
Minimum no. of Class tests to be conducted: 2

UNIT-1 Introduction & Analysis: Analyzing algorithms, Growth function : Asymptotic notation, Standard notation & common functions, Recurrence relation heaps and introduction to 2-3 trees, Algorithms for manipulating 2-3 trees, Representation of heaps using 2-3 trees, Heap sort , Amortized Analysis.

UNIT-2 Dynamic Programming Paradigm: The basic dynamic programming paradigm,Viewing shortest path algorithms from that perspective, Dynamic programming solution to the optimal matrix chain multiplication and the longest common subsequence problems, Top down recursive algorithms using tables of solutions of sub problems as an alternative to bottom up general dynamic programming. Greedy Paradigm :The basic greedy strategy & computing minimum spanning trees, Algorithms of Kruskal and Prim, Use of Union Find Algorithm in implementation of Kruskal's algorithms, The relationship in Dijkstra's and Prim's algorithms, Use of greedy strategy in algorithms for the Knapsack problem and Huffman trees.

UNIT-3 Divide and Conquer Paragidm: Divide and Conquer recurrence equations and their solutions, Quick and merge sorting techniques from the perspective of their fitting into the divde and conquer paradigm, Linear time selection algorithm, The basic divide and conquer algorithm for matrix multiplication. Basic Graph Algorithms: Representational issues in graphs, Depth first search on graphs, Computation of biconnected components and strongly connected components using the depth first-search paradigm, Topological sorting of nodes of an acyclic graph. Shortest Path Algorithms on Graphs: Bellman- Ford shortest path problem, Dijkstra's algorithm & Analysis of Dijkstra's algorithm using Fibonacci heaps, Floyd-Warshall's all pairs shortest path algorithm and its refinement for computing the transitive closure of a graph.

UNIT-4 String Matching Algorithms: Modelling the general string problem as a finite automata, Motivation of the failure function in the Knuth Morris and Pratt Paradigm, Linear time analysis of the KMP algorithm, The Boyer-Moore refinement of the KMP algorithm, computation of the failure functions for the Boyer-Moore algorithm.

UNIT-5 NP-Complete Problems: Examples of problems like traveling salesman tour for which enumeration and back tracking seems to be the only method of finding the optimal solution, The notion of a non deterministic algorithm and its basic relationship to back tracking. The notion of a polynomial time nondeterministic algorithm, Polynomial time non deterministic algorithms for problems like satisfiability, clique problem,Hamiltonian path problems etc. , The definition of Np-hardness and Np-completeness, The statement of Cook's theorem and a discussion of its implications, The notion of polynomial transformation and reductions, Reductions to show that the clique problem, vertex cover, subset sum and Hamiltonian cycle problems are NP-complete.

Text Books:

1. Introduction to Algorithms (Second Edition) PHI, Corman, Lelserson, Rivert and Stein
2. Fundamentals of Algorithms, Galgotia, Sahni & Horowitz.

References Book:

1. Analysis of Algorithms, Pearson Education, Hoffcroff.

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Semester: IX   **Branch**: Computer Application
Subject: Software Project Management   **Code**: 421912 (21)
Total Theory Periods: 40   **Total Tutorial Periods**: 10
Total Marks in End Semester Exam: 80
Minimum no. of class tests to be conducted: **2**

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 Book:
    1. Quantitative methods in project management, Shroff publishers

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Semester: IX   **Branch**: Computer Application
Subject: Cyber Security   **Code**: 421913 (21)
Total Theory Periods: 40   **Total Tutorial Periods**: 10
Total Marks in End Semester Exam: 80
Minimum no. of class tests to be conducted: 2

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, and 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, and 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.

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Semester: IX   **Branch**: Computer Application
Subject: Natural Language Processing   **Code**: 421931 (21)
Total Theory Periods: 40   **Total Tutorial Periods**: 10
Total Marks in End Semester Exam: 80
Minimum no. of class tests to be conducted: 2

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

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Semester: IX   **Branch**: Computer Application
Subject: Distributed Databases   **Code**: 421932 (21)
Total Theory Periods: 40   **Total Tutorial Periods**: 10
Total Marks in End Semester Exam: 80
Minimum no. of class tests to be conducted: 2

UNIT-1 Introduction; Distributed Data Processing, Distributed Database System, Promises of DDBS, Problem areas. Distributed DBMS Architecture: Transparencies in a Distributed DBMS, - DBMS Standardization, and 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

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Semester: IX   **Branch**: Computer Application
Subject: Robotics and Computer Vision   **Code**: 421933 (21)
Total Theory Periods: 40   **Total Tutorial Periods**: 10
Total Marks in End Semester Exam: 80
Minimum no. of class tests to be conducted: **2**

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.

UNIT-2 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

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Semester: IX   **Branch**: Computer Application
Subject: Parallel Processing   **Code**: 421934 (21)
Total Theory Periods: 40   **Total Tutorial Periods**: 12
Total Marks in End Semester Exam: 80
Minimum no. of class tests to be conducted: 2

UNIT–1 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-2 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–3 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–4 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–5 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 Books:
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)

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Semester: IX
Subject: Middleware Technologies
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum no. of class tests to be conducted: 2

Branch: Computer Application
Code: 421935 (21)
Total Tutorial Periods: 10

UNIT–1 Client/ server concepts: Client- server, File server, database server, group server, object server, web server middleware-General middleware, service specific middleware, Client/server building blocks-RPC-messaging-peer-to-peer web services-SOA,SOAP,WSDL, REST services.

UNIT-2 EJB Architecture: EJB-EJB Architecture –overview of EJB software architecture –view of EJB conversion –building and deploying EJBs-Rolein EJB.

UNIT-3 EJB applications: EJB session beans – EJBentity beans –EJB Clients-EJB Deployment Building an application with EJB.

UNIT-4 CORBA: EJB-Distributed Systems –Purpose –Exploring CORBA alternatives-Architecture overview-CORBA and networking model –CORBA object model –IDL-ORB-Building an application with CORBA.

UNIT-5 COM:COM-Datatypes-Interfaces-proxy and stub-Marshalling-Implementing Server /Client-Interface Pointers-Object Creation, Invocation, Destruction-Comparison COM and CORBA Introduction to .Net –Overview of .Net architecture –Marshalling- Remoting.

Text Books:

1. Robert Orfali,DanHarkey and Jeri Edwards, The essential Client /Server Survival Guide, Galgotia Publications Pvt Ltd, 2002(Unit1)
2. Tom Valesky, Enterprise Java beans, Pearson Education, 2002(Unit2&3).
3. Jason Pritchard, COM and CORBA side by side, Addison Wesley, 2000 9unit 4&5).

References Books:

1. JesseLiberty, programming C#, 2nd Edition, O'reilly Press, 2002(unit2 ArnoPuder, Kay Romerand Frank pilhofer, Distributed Systems Architecture, Morgan Kaufman, 2006.
2. Mowbray, Inside CORBA, Pearsin Education, 2002.
3. Jeremy Rosenberger, Teach yourself CORBA in 14 days, Tec Media, 2000.

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Semester: IX   **Branch**: Computer Application
Subject: Software Testing and Quality Assurance   **Code**: 421941 (21)
Total Theory Periods: 40   **Total Tutorial Periods**: 10
Total Marks in End Semester Exam: 80
Minimum no. of class tests to be conducted: 2

UNIT-1 Quality Concept,Definition of Quality, QA, SQA,Quality factors,Software ,Quality Metrics,Process Improvement,Process and Product Quality,The SEI Process Capability ,Maturity model, ISO, Six-Sigma,Process Classification Software Quality Assurance:Need for SQA,SQA Activities,Building blocks of SQA,SQA Planning & Standards.

UNIT-2 Software Reliability:Reliability Measures,Reliability models,Verification & Validation: Verification & Validation Planning, Software inspections, Automated static Analysis, Clean room Software Development. Software Testing:Software Testing Fundamentals,Testing objectives,How test information flows,Testing lifecycle,Test Cases – What it is?, Test Case Designing, Levels of Testing:Unit Testing, Integration Testing,System Testing, Acceptance Testing,Alpha testing & Beta testing,Static vs. Dynamic testing, Manual Automatic testing,Testers workbench,steps of testing process .

UNIT-3 Software Testing:Software Testing Fundamentals,Testing objectives,How test information flows,Testing lifecycle,Test Cases – What it is?, Test Case Designing, Levels of Testing:Unit Testing, Integration Testing,System Testing, Acceptance Testing,Alpha testing & Beta testing,Static vs. Dynamic testing, Manual Automatic testing,Testers workbench,steps of testing process .

UNIT-4 Different types of Testing:Installation Testing,Usability testing,Regression testing,Performance Testing,Load Testing,stress testing,Security testing, Static & Dynamic Testing:Static Testing Techniques,Review types:Informal Review, Technical or peer review, Walkthrough, Inspection, static analysis,Review Meeting,Review Reporting & Record keeping,Review guidelines & Review checklist, Data flow analysis,Control flow analysis,Cyclometric Analysis,Dynamic testing – need & Advantages

UNIT-5 Black Box & White Box Testing (Test Case Design Techniques), Functional Testing (Black Box),Equivalence partitioning, BVA, Cause-Effect graphing, Syntax testing (Concept & Test case generation only), Structural Testing (White Box), Coverage testing, Statement coverage, Branch & decision coverage, Path coverage Domain Testing,Non functional testing techniques,Validation testing Activities,Low level testing, High level testing,Black box vs. White Box.Testing specialized Systems and Applications:Testing object oriented software ,Testing Web based Applications,Computer Aided Software testing tools(CAST) (only type & their purpose should be covered)

Text Book:
1. Software Engineering R. Pressmen – 6th Ed
2. Software Engineering Sommerville
3. Introducing Software Testing Louise Tamres

References Book:
1. Effective Methods for software Testing William Perry
2. Software Testing in Real World Edward Kit
3. Software Testing Techniques Boris Beizer
4. Software quality assurance: Principles and Practices by Nina Godbole,

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Semester**: IX**   Branch: **Computer Application**
Subject: **Mobile Computing**   Code: 421942 (21)
Total Theory Periods: **40**   Total Tutorial Periods: **10**
Total Marks in End Semester Exam: **80**
Minimum no. of class tests to be conducted: **2**

UNIT-1   Issues in Mobile Computing, Overview of wireless Telephony, IEEE 802.11 & Blue Tooth, Wireless Multiple access protocols, channel Allocation in cellular systems.

UNIT-2   Data Management Issues, data replication for mobile computers, adaptive Clustering for Mobile Wireless networks.

UNIT-3   Distributed location Management, pointer forwarding strategies, Energy Efficient Indexing on air, Energy Indexing for wireless broadcast data, Mobile IP, TCP Over wireless.

UNIT-4   Mobile Agents Computing, Security and fault tolerance, transaction processing in Mobile computing environment.

UNIT-5   Ad hoc network, Routing Protocol, Global State Routing (GSR), Dynamic State Routing (DSR), Fisheye State Routing (FSR), Ad hoc On-Demand Distance Vector (AODV), Destination Sequenced Distance – Vector Routing (DSDV).

Text Books:

1. Jochen M. Schiller, Mobile Communications, 2nd edition, Pearson Education, India, 2003.
2. Hansmann, Merk, Nicklous, Stober, Principles of Mobile Computing, 2nd edition Springer International edition, 2003.
3. Dharma P. Agarwal, Qing An Zeng, Introduction to wireless and Mobile systems, 2nd edition Thomas India 2007.
4. Frank Adelstien, Sandeep K.S.Gupta, Fundamentals of Mobile and Pervasive Computing, Tata Mc Graw Hill, 2005.
5. Ivan Stojmenovic, Handbook of Wireless and Mobile Computing, Wiley India.

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Semester: **IX**   Branch: **Computer Application**
Subject**: Grid Computing**   Code: 421943 (21)
Total Theory Periods: **40**   Total Tutorial Periods: **12**
Total Marks in End Semester Exam: **80**
Minimum no. of class tests to be conducted: **2**

UNIT-1 CONCEPTS AND ARCHITECTURE: Introduction - Parallel and Distributed ComputingCluster Computing-Grid Computing-Anatomy and Physiology of Grid-ReviewOf Web Services -OGSA-WSRF.

UNIT-2 GRID MONITORING Grid Monitoring Architecture (GMA) - An Overview of Grid Monitoring Systems- GridI CE – JAMM -MDS-Network Weather Service-R-GMA-Other Monitoring Systems- Ganglia and GridMon

UNIT-3 GRID SECURITY AND RESOURCE MANAGEMENT :Grid Security-A Brief Security Primer-PKI-X509 Certificates-Grid Security-Grid Scheduling and Resource Management-Scheduling Paradigms- Working principles of Scheduling -A Review of Condor, SGE, PBS and LSF- Grid Scheduling with QoS.

UNIT-4 DATA MANAGEMENT AND GRID PORTALS: Data Management-Categories and Origins of Structured Data-Data Management Challenges-Architectural Approaches- Collective Data Management Services-Federation Services-Grid Portals-First-Generation Grid Portals-Second-Generation Grid Portals.

UNIT-5 GRID MIDDLEWARE: List of globally available Middlewares - Case Studies-Recent version of Globus Toolkit and GLite - Architecture, Components and Features.

Text Book:

1. Maozhen Li, Mark Baker, The Grid Core Technologies, John Wiley & Sons ,2005.

References Book:
1. Ian Foster & Carl Kesselman,The Grid 2 – Blueprint for a New Computing Infrascture
Morgan Kaufman – 2004.
2. Joshy Joseph & Craig Fellenstein, "Grid Computing", Pearson Education 2004.
3. Fran Berman,Geoffrey Fox, Anthony J.G.Hey, "Grid Computing: Making the Global
Infrastructure a reality", John Wiley and sons, 2003.

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Semester: **IX**   Branch: **Computer Application**
Subject**: Virtualization and Cloud Computing**   Code: 421944 (21)
Total Theory Periods: **40**   Total Tutorial Periods: **12**
Total Marks in End Semester Exam: **80**
Minimum no. of class tests to be conducted: **2**

UNIT-1 Virtualization: What is Virtualization, Virtualization theory; VMDK File Structure, Advantages and Disadvantages of machine being a file, CPU Virtualization, Memory Virtualization, Interrupt Management VMFS file system, Storage Virtualization, Network Virtualization, Virtual machine and Security issues

UNIT-2 VMware Virtualization Technologies: ESX internals Microsoft –Windows Virtualization Technologies: Hyper-V Xen and KVM Hypervisor. QEMU , SUN's VirtualBox

UNIT-3 Introduction to cloud computing, cloud architecture and service models, the economics and benefits of cloud computing, horizontal/vertical scaling,thin client, multimedia content distribution, multiprocessor and virtualization, distributed storage, security and federation/presence/identity/privacy in cloud computing, disaster recovery, free cloud services and open source software, and example commercial cloud services Cloud Computing and Virtualization Host Clusters Storage Virtualization VM clusters Cloud security fundamentals, Vulnerability assessment tool for cloud,Privacy and Security in cloud

UNIT-4   Cloud computing security architecture: Architectural Considerations- General Issues, Trusted Cloud computing, Secure Execution Environments and Communications, Micro-architectures; Identity Management and Access control-Identity management, Access control, Autonomic Security **Cloud computing security challenges**: Virtualization security management- virtual threats, VM Security Recommendations, VMSpecific Security techniques, Secure Execution Environments and Communications in cloud.

UNIT-5 Cloud Platform Architectures Amazon AWS,Microsoft Azure,Google App Engine, Google MapReduce / Yahoo Hadoop ,Eucalyptus, Nimbus, OpenStack Issues in cloud computing, Implementing real time application over cloud platform Issues in Intercloud environments, QOS Issues in Cloud, Dependability,data migration, streaming in Cloud. Quality of Service (QoS) monitoring in a Cloud computing environment.Cloud Middleware. Mobile Cloud Computing. Inter Cloud issues. A grid of clouds, Sky computing, load balancing, resource optimization, resource dynamic reconfiguration, Monitoring in Cloud

Text Book:
1. Cloud Computing for Dummies by Judith Hurwitz, R.Bloor, M.Kanfman, F.Halper
     (Wiley India Edition)
2. Enterprise Cloud Computing by Gautam Shroff,Cambridge
3. Cloud Security by Ronald Krutz and Russell Dean Vines, Wiley-India

Reference Book:
1. Google Apps by Scott Granneman,Pearson
2. Cloud Security & Privacy by Tim Malhar, S.Kumaraswammy, S.Latif (SPD,O'REILLY)
3. Cloud Computing : A Practical Approach, Antohy T Velte, et.al McGraw Hill,
4. Virtualization for Dummies:Wiley –india

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Semester: **IX**   Branch: **Computer Application**
Subject**: Big Data Analytics**   Code: 421945 (21)
Total Theory Periods: **40**   Total Tutorial Periods: **12**
Total Marks in End Semester Exam: **80**
Minimum no. of class tests to be conducted: **2**

UNIT I   **INTRODUCTION TO BIG DATA:** Introduction to BigData Platform – Challenges of Conventional Systems - Intelligent data analysis – Nature of Data - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

UNIT II   **MINING DATA STREAMS :**Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing - Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window.

UNIT III   **HADOOP** :History of Hadoop- The Hadoop Distributed File System – Components of Hadoop- Analyzing the Data with Hadoop- Scaling Out- Hadoop Streaming- Design of HDFS-Java interfaces to HDFS-Basics-Developing a Map Reduce Application-How Map Reduce Works-Anatomy of a Map Reduce Job run-Failures-Job Scheduling-Shuffle and Sort – Task execution - Map Reduce Types and Formats- Map Reduce Features

UNIT IV   **HADOOP ENVIRONMENT:** Setting up a Hadoop Cluster - Cluster specification - Cluster Setup and Installation - Hadoop Configuration-Security in Hadoop - Administering Hadoop – HDFS - Monitoring-Maintenance-Hadoop benchmarks-Hadoop in the cloud.

UNIT V   **FRAMEWORKS:** Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive - fundamentals of HBase and ZooKeeper. Visualizations - Visual data analysis techniques, interaction techniques.

Text Books:
1. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
2. Tom White " Hadoop: The Definitive Guide" Third Edition, O'reilly Media, 2012.
3. Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press, 2012.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Semester: **IX**   **Branch: Computer Application.**
Subject: **Cyber Security Lab**   **Code:** 421921 (21)
Total Periods**: 40**
Total Marks in End Semester Exam: **50**

Experiments to be performed:

1. Networking Security Programming with TCP/IP for Application layer, Transport layer, Network layer, Datalink layer protocols.

2. Socket Security Programming for address structures, byte manipulation & address conversion functions, elementary socket system calls.

3. APIs security Programming for windows socket API, window socket & blocking I/O model,blocking sockets, blocking functions, timeouts for blocking I/O.

4. Web Security Programming for firewall and others.

5. Web databases security programming.

6. Component Security Programming for CORBA.

7. CGI Security programming and Firewall

8. Programming for Cryptography and Digital Signature.

9. Java network Security programming.

10. Client Server Security Programming.

Recommended Books:-

1. Steven.W.R: UNIX Network Programming, PHI (VOL I& II)
2. Window Socket Programming by Bobb Quinn and Dave Schutes
3. Davis.R.: Windows Network Programming, Addison Wesley
4. NETWORK PROGRAMMING With Windows Socket By Baner .P., PH New Jersey

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Semester: IX
Subject : Software Technology Lab (PHP)
Total Periods: 40
Total marks in End Semester Exam: 50

Branch: Computer Application
Code: 421922 (21)

Experiments to be performed:

1. Design a HTML page to display your CV.

2. Design a HTML form to reserve a railway ticket.

3. Write a Java Script program that finds the greatest common divisor of two numbers.

4. In the form mentioned in problem 2 to reserve a railway ticket add the following

   validations using java Script.

   o   From city and to city are two different cities.

   o   Age of passengers should not be greater than 150.

   o   Name of the passenger should be a string of a maximum length20.

5. Write a program for illustrating client/server side scripting with help of ASP.

6. Write a piece of code in XML for creating DTD, which specifies set of rules.

7. Create style sheet in CSS/XSL and display the document in Internet Explorer.

8. Application – I.

9. Application – II.

10.Applications – III.

Text Book:
1. Atkinson, Leon. *Core PHP Programming*, New York: Prentice Hall.
2. *Learning PHP 5*, By David Sklar Publisher O'Reilly Media
3. *Mastering PHP 4. 1* by Charles, Publisher: Bpb

References:
1. Expert PHP and MySQL, Wrox Programmer to Programmer, Wrox Press, 2010
2. PHP for Absolute Beginners, 9781430224730 (1430224738), Apress, 2009
3. Sams Teach Yourself CSS in 24 Hours (2nd Edition), 9780672329067 (0672329069), Sams Publishing, 2006

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Semester: IX   **Branch:** Computer Application
Subject: Project-III   **Code:** 421923 (21)
Total Periods: 70
Total marks in End Semester Exam: 75

1. Out of 70 periods allocated, in 10 periods of Introduction to PHP, connectivity to database must be taught.

2. Students are supposed to make a web based project