

M.Sc.
Computer Software

Prospectus No. 20141210

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SANT GADGE BABA AMRAVATI UNIVERSITY

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(FACULTY OF SCIENCE)

PROSPECTUS
OF
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COMPUTER SOFTWARE

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Semester-II & Semester IV Summer 2014



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Computer Software
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FOR M.SC.(COMPUTER SOFTWARE)**

SEMESTER - I

PAPER I:-DESIGN AND ANALYSIS OF ALGORITHM

- Unit I** : Divide and Conquer: General Method, Binary Search, Finding the maximum and minimum, Merger Sort, Quick Sort, Selection sort, strassen's matrix multiplication.
- Unit II** : Greedy Methods, Optimal storage, Knapsack Problem, Job sequencing with deadline, Optimal merge patterns, minimum spanning trees, single source shortest path algorithm.
- Unit III** : Dynamic Programming: General Method, multistage graphs, all pair shortest paths, Optimal Binary search trees, 0/1 Knapsack. Reliability design. Traveling salesman problem. Flow shop scheduling.
- Unit IV** : Basic search and traversal techniques:
General Method, Code Optimization, AND/OR graph, Game trees , Bi-connected Components, Depth first search technique.
- Unit V** : Backtracking: General Method, the 8- Queens problem, Sum of subsets. Graph Coloring, Hamiltonian Cycles, Knapsack problem.
Branch and Bound Techniques: General Method, 0/1 Knapsack Problem, Traveling salesperson problem, Efficiency Considerations.

Books :

1. E. Horowitz & S. Sahani : Fundamentals of Computer Algorithm, (Golgolia)
2. Aho & Ullman : Analysis and Design of Algorithm (Addison- Wesley)
3. Hopcroft : Analysis of Algorithm (Addison- Wesley)
4. D. Knuth : The art of Computer Programming Vol I,II,III (Narosa Publishing)
5. Corman : Design and Analysis of Algorithm (PHI)
6. Aho : data structure & Algorithm (Addison- Wesley)

PAPER II:-OPERATING SYSTEM

- Unit I** : General Overview of UNIX system kernel , Architecture of Unix / Linux OS, Kernel data structure, System administration, Buffer cache : Operation, advantages and disadvantages.

- Unit II** : Internal representation of files, I nodes structure, Directories, super block , allocation of disk blocks, System call related to file system in Unix.
Process: Concept & states of process, Transition of process states , Layout of system memory. Context switch, process control, process scheduling and timing.
- Unit III** : Main memory management : Memory management policies in Unix, Swapping, paging and demand paging. Hybrid system, I/O subsystem: Drives, streams and I/O subsystem management in Unix.
- Unit IV** : Inter process communication & Synchronization, Process tracing system, IPC , Network Communication, remote procedure calls , Sockets: Concepts, Programming and implementation in Unix.
- Unit V** : Multiprocessor system: Problems and solutions with Master / Slave processors, Concept of client/server computing, and the role of an Operating System in such environments. Distributed Unix OS.

Books :

1. Bach M.J. ó Design of Unix Operating System (PHI)
2. Crowley ó Operating Systems : A Design-Oriented Approach (TMH)
3. Taneubum A.S. - Operating System : Design & Implementation (PHI)
4. Linux Linleashed (Techmedia)
5. Corner. D. Operating System Design (Prentice-Hall)
6. Back ó Linux Kernel Internals (Addison óWesley)

PAPER III :- .NET TECHNOLOGIES - I

- Unit I** : **ASP.Net:** Introduction ,.Net frame works, Web Forms, Server controls, Server control events, User controls, Web Namespace, Master detailed relationship. State management, validation, Web application security, Mobile framework, Transaction management, Building .Net components, Web Services , Enterprise services. The Session state object, session variable, session state, ASP.Net session state, Associating data.
- Unit II** : Debugging and Error Handling, Using Debugger, Event sequence, File and event log access with ASP.Net, Writing files, creating files and directories, Sending and receiving files, Accessing windows Registry, Sending and receiving Messages, Types of messages.
- Unit III** : **VB.Net:** Application Vs Web sites, Creating configuration files, State maintenance options, Cache object, Caching

ASP.net Pages, controlling access and monitoring, SSL, Tracking usage, advanced page count. Planning applications, Design methodology, plan the user interface, data storage and retrieval, creating database and data access components.

Unit IV : Advance VB.Net Web applications, Client / Server side script, DOM, Accessing the DOM from script, using ActiveX controls, Web services, Remote method call and XML, Interoperate across application / platform, Web Service Description Language, Consume a Web service, SOAP(Simple Object access Protocol) , Finding Web services.

Unit V : Web Services , COM components, Microsoft SOAPtoolkit, Creating client application, building ActiveX DLL, User controls, custom server control, customizing toolkit, Transforming data between web form and component, Efficiency and scalability.

Books :

1. A Russell Jones : ASP.Net with VB.Net. (BPB Publication)
2. Jeffery R. Shapiro : The Complete Reference Visual Basic . Net (TMH)
3. Sams Tech : Teach Yourself VB.Net in 21 Days.
4. VB.Net How to Program : Harvey M. Deitel, P.J. Deitel.
5. An Introduction to Object Oriented Programming with VB.Net : Dan Clark
6. Quest : VB.Net Programming: Y.P. Kanetkar.

PAPER IV :-DATA COMMUNICATION AND NETWORKING

Unit I : Introduction : Definition and use of data Communication, components of communication network, future trends in communication and networking, Network application, Voice communication network. Switches, PBX, cellular technology, FAX machines, special purpose devices. Data communication network architecture, Hosts, Clients Circuit, special purpose communication devices

Unit II : Digital transmission of digital data, Analog transmission of digital data, Modems, Digital transmission of analog data. Data Link Layer: OSI model, media access control, Error control in network, Data link protocols, Transmission efficiency. Network Layer: Network topologies, network routing, network standards, Network protocols, TCP/IP, IPX/SPX, X.25, GOSIP, SNA.

Unit III : LAN: Types, Components of Lan, Ethernet, Token Ring, MAP, Arcnet, Apple talk, Selecting and performance improvement of LAN. LAN/MAN: Types of communication services, Dialed, dedicated & switched circuit services. Packet switched network.

Unit IV : Back Bone networks: Components, Fast Ethernet, FDDI, switched network, Performance improvement, Network design and implementation steps: Feasibility study, Design plan, Information needs, Defining, new network requirements, Geographic scope, Circuit requirements, Network security & control Configuration, costs & implementation.

Unit V : Network management: Functions, Configuration management, performance & fault management, End user support, cost management. Tools, Network Security: Needs, threats, Risk Assessment, Controlling destruction & disaster, unauthorized Access.

Books:

1. J, Fitzgerald & A. Dennis ó Business Data Communication & Networking (5/e)(Wiley)
2. Tenanbarry A.S. ó Computer Network (PHI)
3. Stalling W. ó Data & Computer Communication (PHI)
4. Milless : Analog & Digital Data Communication (Jaico)
5. Sterens : TCP/IP illustrated (Addison ó Wesley)
6. Beyda: Data Communication (Addison ó Wesley)

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SEMESTER- II

PAPER V: ELECTRONIC COMMERCE

Unit I : Introduction: Basic web commerce concept, e-commerce environment, virtual corporation, Applications, Benefits, Element & security of Web commerce. Electronic market place technologies. Modes of e-commerce. EDI, pen EDI, e-commerce with www/Internet. Safe E-commerce: Secure transport protocols, S-HTTP, SSL & alternative, secure transaction (SET), Host security considerations, Enterprise network security.

Unit II : E-Cash & E-payment systems: internet monetary payment and security requirements, confidentiality, integrity, authentication, inter operatability payment and purchase order process. On-line electronic cash: overview, problem,

issues, implementation & e-cash inter operatability. Electronic payment schemes.

- Unit III** : Security: need for computer security, specific intruders approaches, security strategies, security tools, Encryption methods, Enterprise networking & internet access, Antivirus program, security teams.
- Unit IV** : Master Card/Visa card Processing: Introduction, Business requirements, Payment system participants, cryptography, certificate issuance, kinds of shopping, payment processing, cardholder/merchant registration, purchase request, payment authorization & capture.
- Unit V** : E-mail & Secure E-mail: A model for message handling, working of e-mails. MIME: Basic concept, parts, data encoding technique, address directory. S/MIME.MOSS. Comparisons of security methods. MIME & related facilities over the internet.

Books:

1. Minda & Minoli Web Commerce Technology Handbook (TMH)
2. Kakakota & Whinston Frontiers of Electronic Commerce (Addison ó Wesley)
3. Kakakota & Whinston Frontiers of Electronic Commerce (Addison ó Wesley) Electronic Commerce (Jaico)
4. Kamlesh K. Bajaj & DNag, E-Commerce, the cutting edge (TMH) of Nusiness.
5. Understanding Electronic Commerce ó David Kansur (Misor of press)

PAPER VI: CORE JAVA

- Unit-I** : Fundamentals : History & features of Java. Overview of Java : OOP, Applications of Applets. Lexical Issues, Keywords, class Libraries. Data Types, Variables & Arrays, Various types of operations in Java. Control statements.
- Class fundamentals, declaring objects, introducing methods, construction, this keyword, garbage collection, finalize () method. Method overloading. Objects as parameters. Access control, Nested & inner classes. String class, command-line arguments.
- Unit II** : Inheritance basics, Using super, Multilevel hierarchy, Method overriding. Dynamic method dispatch, Abstract classes, Final keyword, object class. Packages, class path, access protection, importing packages, interfaces & their usage.

- Unit III** : Exception-handling fundamentals, type, using & catch blocks. Javasø built in exceptions, using exceptions, Multithreading, Thread model, Main thread, Creating a thread ; various approaches. Thread priorities, Thread Synchronization, Inter thread communication.
- Unit IV** : I/O basics, streams, reading & writing to console, Printwritess class. Reading/writing files. Apple fundamentals & programming. The transient & volatile modifiers. Applet class, architecture & skeleton. Applet display methods, status window, HTMLAPPLET tag. Parameter passing.
- Unit-V** : Event Handling : Event delegation model, Event classes, Event Listener interfaces, Using event delegation model, Adopter classes, AWT classes. Window fundamentals. Frame Windows; AWT controls : Labels, button, check boxes, choice, lists, scrollbars, Text Field, Text Area. Layout Managers, Menu Bar & Menus. Dialog Boxes, File Dialog.

Books :

1. P.Navghtan & H.Schildt : Java 2 complete Reference (3/e) (TMH)
2. Java 2 Unleashed (3/e) (Techmedia)
3. Webev : Using Java 2 Platform (PHI)
4. Sankar : Java 2 Class Libraries Unleashed (Techmedia)
5. Timothy Budd : Understanding object oriented
6. Arnoid : The Java Programming Language (Addison-Wesley)

PAPER VII: RDBMS

- Unit I** : Introduction: Data base systems & the evolution of database technology. File oriented systems, data base systems, client/server systems. Database systems in the organizations. Conceptual database design, data models, objects, Aggregation, Generalization. Relational Data model: Fundamental concepts,
- Unit II** : Normalization process, 1NF, 2NF, 3NF, 4NF, BCNF transforming a conceptual model to a Relational model. Relational Algebra; Relational calculus, Relational implementation with SQL: overview, schema & table definition, data manipulation, view definition, Information schema.
- Unit III** : Client/Server Databases: Introduction, defining database tables on server DBMS. Server data manipulation & programming. Developing client applications. Visual Basics approach to client application. Creating queries in VB. VB data control & DAO.

- Unit IV** : Physical data base system: Storage media, disk performance factors, data storage formats on disk, file organization & Access methods. Implementing logical relationships, balanced- tree indexing, Query optimization.
- Unit V** : DB Administration: overview, DBA functions, goals, Database integrity, database systems: General DDS model, Design issues, data integrity in DDS. Database Recovery in DDS.

Books:

1. Raghuram Ramkrishna ó Database Management System (McGrawHill)
2. Hansen & Hansen ó Database Management & Design (PHI)
3. Korth & Silberschatz ó Database Management & system (McGrawHill)
4. C.J. Date - Database Management system (Addison ó Weley)

PAPER VIII: FREE OPEN SOURCE SOFTWARE

- Unit-I** : Overview of Free/Open Source Software ó Definition of FOSS & GNU, History of GNU/Linux and the Free Software Movement , Advantages of Free Software and GNU/Linux, FOSS usage , trends and potential ó global and Indian. GNU/Linux OS installation ó detect hardware, configure disk partitions & file systems and install a GNU/Linux distribution ; Basic shell commands - logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management ; User and group management, file ownerships and permissions, PAM authentication ;
Introduction to common system configuration files & log files ; Configuring networking, basics of
TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, Ethernet, leased line).
- Unit-II** : Configuring additional hardware - sound cards, displays & display cards, network cards, modems, USB drives, CD writers ; Understanding the OS boot up process ; Performing every day tasks using gnu/Linux ó accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs ; X Window system configuration and utilities ó configure X windows, detect display devices ; Installing software ó from source code as well as using binary packages. Setting up email servers ó using postfix (SMTP services), courier (IMAP & POP3

- services), squirrel mail (web mail services) ; Setting up web servers ó using apache (HTTP services), php (server-side scripting), perl (CGI support) ; Setting up file services ó using samba (file and authentication services for windows networks), using NFS (file services for gnu/Linux / Unix networks) ; Setting up proxy services ó using squid (http / ftp / https proxy services) ; Setting up printer services - using CUPS (print spooler), foomatic (printer database)
- Unit-III** : Setting up a firewall - Using netfilter and ip tables; Using the GNU Compiler Collection ó GNU compiler tools ; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas) ; Understanding build systems ó constructing make files and using make, using autoconf and autogen to automatically generate make files tailored for different development environments ; Using source code versioning and management tools ó using CVS to manage source code revisions, patch & diff.
- Unit-IV** : Understanding the GNU Libc libraries and linker ó linking against object archives (.a libraries) and dynamic shared object libraries (.so libraries), generating statically linked binaries and libraries, generating dynamically linked libraries ; Using the GNU debugging tools ó gdb to debug programs, graphical debuggers like ddd, memory debugging / profiling libraries mpatrol and valgrind ; Review of common programming practices and guidelines for GNU/Linux and FOSS ; Introduction to Bash, sed & awk scripting, Basics of the X Windows server architecture.
- Unit-V** : Qt Programming ; Gtk+ Programming ; Python Programming ; Programming GUI applications with localisation support.

REFERENCES

Text Book :

1. *Introduction to Linux: Installation and Programming* N. B. Venkateshwarlu (Ed); B S Publishers; 2005. (An NRCFOSS Publication)

Reference Books :

2. *Running Linux*, Fourth Edition, Matt Welsh, Matthias Kalle Dalheimer, Terry Dawson, and Lar Kaufman, OóReilly Publishers, December 2002, ISBN: 0-596-00272-6.
3. *Linux Cookbook*, First Edition, Carla Schroder, OóReilly Cookbooks Series, November 2004, ISBN: 0-596-00640-3.

On-line materials

1. *Open Sources: Voices from the Open Source Revolution*, First Edition, January 1999, ISBN: 1-56592-582-3. URL: <http://www.oreilly.com/catalog/opensources/book/toc.html>
2. *The Linux Cookbook: Tips and Techniques for Everyday Use*, First Edition, Michael Stutz, 2001. URL: http://dsl.org/cookbook/cookbook_toc.html
3. *The Linux System Administrators' Guide*, Lars Wirzenius, Joanna Oja, Stephen Stafford, and Alex Weeks, December 2003. URL: <http://www.tldp.org/guides.html>
4. *Using GCC*, Richard Stallman et al. URL: <http://www.gnu.org/doc/using.html>
5. *An Introduction to GCC*, Brian Gough. URL: <http://www.network-theory.co.uk/docs/gccintro/>
6. *GNU Autoconf, Automake and Libtool*, Gary V. Vaughan, Ben Elliston, Tom Tromey and Ian Lance Taylor. URL: <http://sources.redhat.com/autobook/>
7. *Open Source Development with CVS*, Third Edition, Karl Fogel and Moshe Bar. URL: <http://cvsbook.red-bean.com/>
8. *Advanced Bash Scripting Guide*, Mendel Cooper, June 2005. URL: <http://www.tldp.org/guides.html>
9. *GTK+/GNOME Application Development*, Havoc Pennington. URL: <http://developer.gnome.org/doc/GGAD/>
10. *Python Tutorial*, Guido van Rossum, Fred L. Drake, Jr., Editor. URL: <http://www.python.org/doc/current/tut/tut.html>

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**SEMESTER- III
PAPER IX: SOFTWARE ENGINEERING**

- Unit I** : Evolution role of software. Software crises & myths. Software engineering. Software process & process models: Linear Sequential, prototype, RAD, Evolutionary, Product & process. Project Management concepts: People, Product, Process, Project. WSHH principle, Critical practices. Measures, merits & indicators. Metrics in process & project domains ó Software measurement, metrics for software quality, small organization.
- Unit II** : Software project planning: scope, resources, estimation, decomposition technique, Tools. Software risks: identification, risk: identification, risk projection, refinement & RMMM plan. Project scheduling: Concepts, people

Efforts, Task set, Task network, Scheduling. EV analysis, Project Plan. Software quality concepts. SQ Assurance, software reviews, technical reviews, software reliability, ISO goal, SQA plan.

- Unit III** : SCM process. Version control: SCM standards. System engineering: Hierarchy, Business Process & Product engineering: Overviews. Requirement engineering, system modeling, Requirement analysis. Analysis principle, software prototyping, Specification.
- Unit IV** : Design process. Design principle & concepts. Effective modular design. Design model & documentation. Software architecture, Data Design, Architectural styles, equipment mapping, Transforms & Transaction mappings. User interface design: Golden Rule, UID, Task analysis & modeling, ID activities, Tools design evolution. Component level design: Structured programming, comparison of design notation.
- Unit V** : Software testing fundamentals, test case design, whitebox testing. Basis path control structure, Black box - Testing & for specialized environments. Strategic approach to S/W testing. Unit testing, integration testing, Validation testing, system testing, Debugging. Technical metrics for software.

Text Book:

1. Pressman Roger S. S/W Engineering, A Practitioner's approach (S/E) TMH.
2. Sommerville, Software Engineering (Addison-Wesley) (S/E)
3. Fairly R. Software Engineering (Mc Graw Hill)
4. Davis A Principle of Software Development (Mc Graw Hill)
5. Shooman, M.L., Software Engineering (Mc. Graw Hill)
6. Desikan, Ramesh : Software testing Principles and Practices (PE)

PAPER X: ADVANCED JAVA

- Unit I** : Applet and AWT tools, Windows fundamentals, working with various controls, Layout managers, Image controls, Working with events, Interfaces & event listeners.
- Unit II** : **Packages:** API Packages, Reflection, Remote method invocation, Stand alone applications ,Client /Server application using RMI., Socket programming.
- Unit III** : **Java Beans:** Bean development kit, JAR Files, creating Bean, Properties of bean, BeanInfo Interface, Java Bean API. Multithreading, priority of a thread, changing the priority.

Unit IV : **Swing:** JApplet, Icons & Labels, text fields, buttons, combo boxes, Tabbed Panes, Scroll Panes, Trees , tables, Exploring Swing.

Unit V : **Servlets:** Life cycle of a servlet, JSDK, Servlet API, Servlet Package, Classes and interfaces in servlets, Servlet parameters, reading and initializing servlets, HTTP, Request/ Response.

Books :

1. P. Navghatan & H. Schildt :Java2 Complete Reference(TMh)
2. Java 2 Unlashed (Techmedia)
3. Dietel & Dietel : Java 2

PAPER XI: .NET TECHNOLOGIES II

Unit I : Introduction , .Net Framework, common language runtime, class library, general purpose languages, Domain specific languages, Working in groups, Common language runtime, common type system, common language specification, MSIL, metadata.

Unit II : **C#** : Introduction, Types, variables, Expressions, Operators, Boxing and unboxing, Type declaration, Input from console, Printing and formatting the output, interactive I/O, CLR, Command line arguments, controls and statements : Decision making, Iteration , branching statements.

Unit III : Classes, Objects, Objects as data types, static methods, class members, Controlling access, implementing class, Methods, Overloading methods, implementing methods, Abstract and base classes, virtual methods.

Unit IV : Structs and enum, arrays, strings, attributes, Exception and error handling, Common Exception classes, Exception handling routine. Data handling , ADO, Accessing and using Data in ADO, data set and commands.

Unit V : Printing in C#, Print preview , List View, automatic memory management, Garbage collection, algorithms for garbage collection, Finalization, Resurrection , Clean up , forcing an object clean up

Books :

1. Er. V.K.Jain : The Complete guide to C# Programming (Dreamtech Press)
2. Eric Gunnerson : A Programmers introduction to C# (APress)
3. Y.P. Kanetkar : C# .Net Fundas

4. Y.P. Kanetkar : Teach your self C# .Net Part ó I
5. Y.P. Kanetkar : Teach your self C# .Net Part ó II

PAPER XII: NETWORK SECURITY

Unit I : Introduction to network security, passive and active attacks, authentication, integrity, access control, The model of internet work security, internet standards : the internet society and RFC publications (Request for comments.)

Unit II : Cryptography : Encryption principles and various algorithms, standardization process, key distribution, public key cryptography and message authentication, digital signature. Network security applications : Kerberos, X.509 directory authentication services, e-mail security PGP (Pretty Good Privacy) operational description. MIME (Multipurpose Internet Mail Extensions), S MIME (Security/ Multipurpose internet mail extensions) functionality.

Unit III : IP Security : Overview, IP security architecture, Authentication header, Web Security : Web security requirements, secure socket layer SSL, Transport layer security TLS, Secure Electronic transactions TES.Network.

Unit IV : Management Security : Basic concepts of SNMP, Network management architecture and protocol architectures, proxies, services, SNMPv1 authentication service, access policy and proxy service, SNMPv2 architecture, message processing and user security model, view based access control.System

Unit V : Security : Intruders, Intrusion technologies, password protection, password selection strategies, Intrusion detection, viruses and related threats : Nature of viruses, types, micro viruses and various antivirus approaches. Firewall : Characteristics, types of fire walls, Firewall configuration, Trusted systems, data access control, the concept of the trusted systems.

Books :

1. Network Security Essentials - William Stallings (Pearson Edu. Asia)
2. Network Security : Kaufman, Perlman, speciner(PE)
3. Network Security : Ahkit Fadia (M)
4. Network Security essential by stallings - pearson
5. Cryptography & Network Security by stallings ó pearson.

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SEMESTER-IV
PAPER XIII:ARTIFICIAL INTELLIGENCE**

- Unit I** : Introduction to Artificial Intelligence : Overview of Artificial Intelligence. Knowledge : General concept, Introduction to LISP : Syntax and numerical functions. Basic list manipulation function in LISP. Functions, predicates and conditional Input, output and local variables, iteration and recursion. Property list and arrays.
- Unit II** : Knowledge representation - I: Syntax and semantics for propositional logic. Syntax and semantics for FOPL. Properties of Wffs. Conversion to clausal form. Inference rules. The resolution principle, Nondeductive inference methods. Representation using rules.
- Unit III** : Knowledge representation - II: Truth maintenance system. Default reasoning and closed world assumption. Predicate completion and circumscription, model and temporal logics. Overview of object oriented systems, object classes messages and methods, simulation examples using OOS program.
- Unit IV** : Knowledge organization and manipulation: Preliminary concept, Examples of search problems, Uniformed and blind search. Informed search. Searching AND-OR graphs, structure used in matching. Measures for matching: distance matrices, qualitative measures, similarity measures. Partial matching, Indexing and retrieval technique, Integrating knowledge in memory. Memory organization system.
- Unit V** : Knowledge Acquisition : General concept in knowledge acquisition, Learning by induction. Analogical and explanation based learning : Analogical learning and reasoning, Explanation and learning. Expert system : Expert system architectures : Introduction, Rules based system architecture. Nonproductive system architecture, Dealing with uncertainty. Knowledge acquisition and validation. Knowledge system building tools.

Books :

1. Artificial Intelligence by Elaine Rich, Mcgrawhill Inc.
2. Artificial Intelligence and Expert Systems- Jankiraman, Sarukesi (M)
3. Expert System : Theory and Practice ó Ermine (PHI)
4. Turbo prolog ó Nath (GP)

5. List Programming ó Rajee Sangal ó (TMH)
6. Rule Based Expert System ó M. Sasikumar (Narosa)
7. Artificial Intelligence ó Russel ó Pearson ó 1st Text Book
8. Prolog : Prog. For A.I. by Bratko ó Pearson
9. Int. to Expert syst ó Jackson ó Pearson
10. Principles of AI ó Nils Nilson
11. A.I. by R.J. Winston ó Pearson
12. Prolog Programming and application ó Burnhan & Hall
13. ES: Theory and Practice ó Ermine ó PHI
14. Artificial Intelligence and Intelligent system by N.P.Padhy.

PAPER XIV: WEB SERVER ADMINISTRATION

- Unit I** : Communication Architecture of web, Functions of a Webserver. Planning for Microsoft IIS Architecture & Services. Windows NT and IIS. Internet Connectivity Architecture.
- Unit II** : IIS installation, Examining the components, Installing & using FTP services : FTP overview, Clients & Users, Virtual Servers, Directories. Installing & using Mail Services: SMTP protocol, procedures, Configuring Internet mail Server. Installing & using News server components, configuring the News Server. Broadcasting with Netshow.
- Unit III** : ISAPI Architecture, Applications, Filters & DLL. Index Server Overview: Architecture, Using Index Server, CRS. IIS Administration: Logging IIS activity & Reading. Reports.
- Unit IV** : Server side Loading, TCP/IP troubleshooting utilities: Microsoft site server. Allowing dynamic user Access Firewalls & Internet Security. Secure transaction with IIS. Web site maintenance & Promotion Organizing & Assigning maintenance task. Hyperlinks verification. Promoting the site. Search engine listing, E-mail publicity, Banner Ads.
- Unit V** : Apache Server : Introduction, Installing Apache, Configuring Apache, starting , restarting and stopping, Advance administration , hosting multiple sites , Proxy server and caching , logs and monitoring , security, dynamic content , performance tuning, URL reviewing , Module construction .

Books:

1. Nelson Howell Using IIS4 Que (EEE)
2. (TMH) IIS Complete Reference Menller & Sheldon.

3. Microsoft internet information server tool kit / Resource kit. (Microsoft Press)
4. Mastering FrontPage 2000 (Techmedia)
5. Scott Hawkins : APACHE web server administration & E-commerce Handbook (PE)

PAPER XV: DATA MINING AND WAREHOUSING

- Unit I** : Introduction, Data mining, Data mining functions, classification and major issues. Data Preprocessing : Data cleaning, data integration and transformation, data reduction, discretisation concept hierarchy generation.
- Unit II** : Data mining primitives: Data mining primitives, data mining query language. Concept description: concept description, data generalization, Analytical characterization, mining class comparison.
- Unit III** : Application and trends in data mining: data mining applications, data mining systems and research Prototypes, additional themes on data mining, trends in data mining, Data Mining tools: Architecture, Memory Based Reasoning, Automatic cluster detection, Neural Networks, Genetic Algorithms, Decision Trees.
- Unit IV** : Data ware house design: OLAP, MOLAP, ROLAP Technologies Data Staging: overview, plan effectively, dimension table staging, fact table loads and ware house operations, data quality and cleansing, miscellaneous Issues, Distributed data ware house, its architecture, types of database distribution.
- Unit V** : Building end user applications: role of end user application, application specification, end user application development, maintaining and growing data ware house: manage the existing data ware house environment, prepare for growth and evaluation, data ware house analysis, CUBE, ROLL UP and STAR queries.

Books :

1. J. Han and M.Kamber :Data Mining Concepts and Techniques, Elsevier Pub. Indian Reprint, 2004.
2. R. Kimball : The Data Ware House Life Cycle Tool Kit, Wiley Press, John Wiley and Sons (ASIA) Pvt. Ltd.
3. Berson : Data Ware Housing, Data Mining and OLAP, Tata McGraw Hill.

4. Arun K. Pujari : Data Mining Techniques, University Press (Orient Longman)
5. Michale Corey, Michale Abbey, Oracle 8i Data Warehousing; Tata McGraw Hill.
6. Navathe; Data Mining, Orient Longman, 2003

PAPER XVI: COMPUTING TECHNIQUES IN BIOINFORMATICS

- Unit I** : Introduction to Bioinformatics, its branches, applications, area of research. Introductory biology for bio informatics. Bio informatics data bases, its categories, type .retrieval system, sequence and Molecular file formats, prediction of Protein structure.
- Unit II** : Data bases in bioinformatics:-sequence data bases, Structure data bases, and other data bases. PDB, MMDB, CATH, FSSP, DALI, SCOP, MEROPS, BRENDA, CAZY, enzyme DATA BASES, NTSYS-pc, SOPMA, FASTA, BLAST.
- Unit III** : Tools in Bioinformatics:-Tools, its need, trends, Data submission sequence submission, protein submission, tools. Data analysis tools, Prediction tools, Modeling tools.
- Unit IV** : Algorithms in Bioinformatics:-, Biological, Bio informatics algorithms, analysis, Sequence comparison, substitution matrices, prediction, structure algorithms, unweighted pair group method for arithmetic averages (UPGMA).
- Unit V** : Modeling and simulation and statistical protocols., Monte Carlo methods Molecular dynamics simulation package. Commercial and Academic bio informatics software, its applications and PERL for bioinformatics.

BOOKS:-

1. BIO INFORMATICS data bases, Tools, Algorithm: Orpitra Bosu, & S.K.thakural ,Oxford University Press.
2. Bio informatics :Principle and applications.: Zhummur Ghosh & B.Mallick, Oxford University Press.
3. Introduction to Bioinformatics:Arther M.Lesk Oxford university Press
4. Introduction to Bioinformatics;AttwoodDavid J. etc Long man Pub.
5. Introduction to Bioinformatics algorithm:Jone,Pavel A.P etc,Anne pub.
6. Fundamental concepts of Bio informatics:Krane, Dan E, Pearson Pub.
7. Developing Bio informatics Computer Skill:Gibas,Cythia, shroff pb

8. Bioinformatics, methods and applications: S.C Rastogi, N. Mendiratta, P. Rastogi. Tata MCgraw-Hill India.
9. Bioinformatics computing: Bergeron Bryan. Prentice-Hall of India Private Limited.
10. Bioinformatics, A Beginner's guide : Jean- Michel Claverie and Cedric Notredane. WILEY-dramtech India Pvt. Ltd.

**Distribution of Practical
(Common for Each Semester & Practical)**

Breakup of Marks :-

a) Lab. Practical :-

i) Two Programme	30 Marks (15 Each)
ii) Practical Record	05 Marks
iii) Viva-Voce	05 Marks
iv) Internal Assessment	10 Marks
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Total	50 Marks

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b) Project Work :

i) Project Work and Presentation	30 Marks
ii) Project Report	05 Marks
iii) Project Viva-voce	05 Marks
iv) Internal Assessment	10 Marks
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Total	50 Marks

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Each M.Sc.-II student is required to submit two copies of report at the time of examination. The project work will be evaluated by external and internal examiner.
