



SHIVAJI UNIVERSITY, KOLHAPUR
(Implemented from June, 2005)
B.E. PART – I (Information Technology)

Name of Subject	L	P	Theory Paper	T/W	OE	POE	Total
1. Object Oriented Modeling and Design (OOMD)	4	2	100	25	50		175
2. Advanced Database System	4	2	100	25	-	50	175
3. Information system security	4	-	100	-	-	-	100
4. Network Engineering	2	4	-	25	50	-	75
5. Elective-I	4	-	100	-	-	-	100
6. Project I		4		25	50		75
	18	12	400	100	150	50	700

PART -II

Name of Subject	L	P	Theory Paper	T/W	OE	POE	Total
1. Software testing & quality assurance	4	2	100	25	50	--	175
2. IT Business Methodology	4	--	100	--	--	--	100
3. Mobile Technology	4	--	100	--	--	--	100
4. Web. Technology	2	4	--	25	--	50	75
5. Elective –II	4	--	100	--	--	--	100
6. Project II		6		50	100	--	150
Total	18	12	400	100	150	50	700

Electives-I

- 1) Embedded & Real time system
- 2) ANN
- 3) Discrete event system simulator & Modeling

Electives-II

- 1) Intelligent Systems
- 2) Multimedia storage & communication
- 3) GIS & Remote sensing



SHIVAJI UNIVERSITY, KOLHAPUR
(Implemented from June, 2005)
B.E. (INFORMATION TECHNOLOGY) PART – I

1. Object Oriented Modeling And Design

Lectures: 4 hrs/week
Practicals: 2 hrs/week

Theory: 100 Marks
T/W: 25 Marks
OE: 50Marks

SECTION-I

1. Introduction: 2hrs
Object Oriented development and themes, evidence for usefulness, modeling as a Design Technique.

2. Object Modeling: 5 hrs
Objects, classes, links and associations, generalization and inheritance, grouping constructs, aggregation, abstract classes, generalization as extension and restriction, multiple inheritance, metadata, candidate keys and inheritance.

3. Dynamic and Functional Modeling: 5 hrs
Events, states, operations, concurrency, nested state diagrams, advanced dynamic modeling concepts, relation of object and dynamic models, DFD, relation of functional to object and dynamic models

4 . Design Methodology: 8hrs
Preview of OMT technology, Impact of an object oriented approach, Analysis, System design with examples, Combining models, Designing models, Designing algorithms, Optimization of design, control. Associations, Physical packaging, Comparing methodologies using structure analysis and design, Jackson's structured development Information modeling notation and object oriented works

SECTION-II

5. Implementation of OMT 4hrs
Use of programming language and database system, Object oriented style, feature of object-oriented languages, Applications of OMT like object diagram compiler, Computer animation, Electrical distribution design system

6. Structural Modeling using UML: 6hrs
Classes, Relationships, Common mechanisms. Diagrams, Class Diagrams, Interfaces, Types and Roles, Packages, Instances and Object Diagram

7. Behavioral Modeling using UML: 5 hrs

Interactions, Use cases, Use case diagram, Interaction Diagrams and Activity diagrams, Events and signals, State Machines, Processes and Threads, Time and space, State chart diagrams.

8. Architectural Modeling using UML: 5 hrs

Components, Deployment, Collaboration, Patterns and Frame works, Component diagrams and Deployment Diagrams

Text Books:

1. Object Oriented Modeling and Design:
Rambaugh, Premerlani, Eddy, Lorenson (PHI)
2. The Unified Modeling Language User Guide
Grady Booch, Jeams Rambaugh, Ivar Jacotson (Addison Wesley)

Reference:

1. Object Oriented Analysis and Design – Andrew High (TMG)
2. Practical Object Oriented Design with UML – Mark Priestley.
3. Object oriented Analysis & design – Kahate (TMH)

Term Work:

Term should consist mini project on designing of real world problem in UML and implementation of the same in Object Oriented language.

B.E. (INFORMATION TECHNOLOGY) PART – I**2. Advance Database Systems**

Lectures : 4 hrs/week
 Practicals : --2 hrs/week

Theory: 100 Marks
 T/W: 25 Marks
 POE : 50 Marks

Section-I

- 1.Parallel and Distributed Databases** **8 hrs.**
 Architectures for parallel database, Parallel query Evaluation, Parallelizing individual operation, Parallel Query Optimization, Distributed DBMS Architecture, Storing data in distributed DBMS, Distributed Catalog Management, Distributed query processing, Updating distributed data, Distributed concurrence control, Distributed recovery
- 2.Web databases :** **7 hrs.**
 Web search engines, web search architecture, Inverted indexes the IR way, Inverted indexes for web search engines, web crawling, web search statistics.
- 3.Decision Support** **5 hrs.**
 Introduction Data Warehousing OLAP, Implementation Techniques for OLAP, Views and decision support.
- 4.Data Mining:** **5 hrs.**
 Introduction, Counting Co-occurrences, Mining for rules, Tree structured rules. Clustering, Similarity search over sequences, Additional data mining tasks.

Section-II

- 5. Object Database Systems:** **6 hrs.**
 User defined abstract data types, Structured types, Objects, Objects Identity and Reference types, Inheritance, database design for an ORDBMS, Comparing RDBMS with OODBMS and ORDBMS.
- 6. Spatial Data Management:** **6 hrs.**
 Types of Spatial Data and Queries Application involving Spatial data. Introduction to spatial Indexes, Indexing based on space filling Curves, Grid files, R trees, High command Indexing.
- 7. Deductive Databases:** **6 hrs.**
 Recursive Queries, Theoretical foundation, Recursive Queries with Negation, Efficient evaluation of Recursive Queries, Additional Transaction Processing. Advance transaction processing Integrated access to Multiply data sources, Mobile database, multiplying database, Geographic Information systems. Temporal and Sequence database, Information Visualization.

Text Books: 1) Database Management Systems By Raghu Ram Krishnan. IInd edition
2) Database Management Systems By Raghu Ram Krishnan. IIIInd edition (For Chapter No.2)

Reference:

1. Database System Design Implementation & Management By Rob & Control (Thomson Learning)
2. An Introduction to database system” By Date, Addison Wesley Pub.
3. “Principles of Repagination database” By Desai Galgotia Publications.
4. Decision support and data warehouse systems By Mallach (TMH)

Experiment List :

- 1) Implement parallel sorting and aggregates.
- 2) Implement parallel joins
- 3) Implement Hash joins
- 4) Implement semi join in distributed DBMS
- 5) Implement bloom join in distributed DBMS
- 6) Implement two phase commit in distributed DBMS
- 7) Implementation of OLAP queries
- 8) Implementation of cube operator in OLAP queries in data warehousing and decision support system
- 9) Implement decision tree of data mining problem
- 10) Implement a priori algorithm in data mining
- 11) Simulation of a search engine
- 12) Implement view modification and materialization in data warehousing and decision support systems
- 13) Implementation of data log queries for deductive databases (Negation, Aggregate, Recursive etc.)
- 14) Implement R Trees in spatial databases
- 15) Implementation of spatial database queries

Minimum 8 to 10 experiments based on the syllabus and above experiment list should be implemented using ORACLE / MSSQL SERVER / JAVA.

B.E. (INFORMATION TECHNOLOGY) PART – I**3. Information System Security****Lectures : 4 Hrs/Week****Theory : 100 Marks****Section – I****1) Symmetric Ciphers :****8 hrs.**

Overview – Services, Mechanism and Attacks, The OSI Security. Architecture, A model for network security Classical Encryption techniques – Symmetric Cipher model, Substitution. Techniques, Transposition techniques, Rotor Machines, Steganography. Block Cipher and Data Encryption Standard – Simplified DES, Block. Cipher principles, The Data Encryption Standard, The strength of DES, Differential and Linear Cryptanalysis, Block Cipher design principles, Block Cipher mode of Operation.

2) Asymmetric Ciphers :**12 hrs.**

Public Key Cryptography and RSA – Principles of Public Key Cryptosystems, The RSA Algorithm Key management ; Other public key cryptosystems – Key Management, Diffie-Hellman Key Exchange, Elliptical Curve Arithmetic, Elliptical curve Cryptography Message Authentication and HASH Functions – Authentication requirements, Authentication Functions, Message Authentication Codes, Hash Functions, security of Hash Functions and MACS Digital Signatures and Authentication Protocols – Digital Signatures, Authentication Protocols, Digital Signature Standard.

Section – II**3) Network Security practice :****12 hrs.**

Authentication Applications – Kerberos, X.500 Authentication Service Electronic Mail Security – Pretty Good Privacy, S/MIME IP Security – IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating security payload, Combining Security Associations, Key Management WEB Security – Web Security Considerations, Secure Socket Layer and Transport Layer Security, Secure Electronic Transaction.

4) System Security :**8 hrs.**

Intruders – Intruders, Intruder detection, Password Management, Malicious Software – Viruses and Related Threats, Virus Countermeasures, Firewall design principles, Trusted system.

Text Book :

Williams Stallings – Cryptography and Network security principles and practices. Pearson Education (LPE)

Reference Books :

- 1) Menezes, A.J., P.C.Van Oorschot, and S.A. Vanstone, “Handbook of Applied Cryptography”
- 2) Schneir, Bruce, “Applied Cryptography : Protocols and Algorithms”

B.E. (INFORMATION TECHNOLOGY) PART – I**4. Network Engineering**

Lectures : 2 Hrs/Week
Practicals : 4 Hrs/Week

Term Work : 25 Marks
OE : 50 Marks

- 1) Network Hardware** **1 hrs.**
 Network Introduction, Network Interface Adapter-Function, Features, Selection of NIC. Cabling a Network – Cable properties, Standards, Types, cable installation. Network Interconnection devices :
 Repeaters, Hubs, Bridges, Routers, Switches, Server Technologies : Multiple processor server, Server storage technologies. Designing a Network.
- 2) Network Operating System** **4 hrs.**
 a) Windows 2000 and Windows NT Overview, Windows Networking Architecture, File System, Windows Networking Services. Windows NT Domains.
 b) Novell Netware : Netware role in Enterprise, Netware Versions, Netware installation, Netware Storage Subsystem.
 c) Linux
 d) Network Clients : Windows Network Clients, Netware Clients, Unix Clients.
- 3) Directory Services** **4 hrs.**
 a) Active directory services
 Active directory architecture, Deploying active directory, Designing active directory, Managing ,Active directory.
 b) Novel directory services : NDS architecture, NDS tree design, Building the tree NDS security.
- 4) Installation of NOS** **4 hrs.**
 a) Installation of windows 2000 / windows NT
 b) Installation of Novell Netware
 c) Installation of Linux.
- 5) Managing users and groups** **1 hrs.**
 Managing users and groups on windows, Linux and NetWare.
- 6) Configuration of Network and communication services** **2 hrs.**
 a) DHCP b) DNS c) WINES
- 7) File system** **2 hrs.**
 a) NTFS and distributed file system on win 2000
 b) NFS
 c) Sharing and securing files and folders
- 8) Network Services** **2 hrs.**
 a) Web serve
 b) Ftp Server
 c) E-mail Server
 d) Telnet Server

9) Network Management and troubleshooting tools

2 hrs

- a) Operating System utilities
- b) TCP/IP utilities,
- c) Network analyzer
- d) Traffic analysis
- e) Protocol analysis
- f) Network Management Using SNMP.

Books :

- 1) The complete Reference Networking by Craig Zacker TMH Publication.
- 2) Distributed Systems and Networks by William Buchanan TMH Publication.
- 3) Windows 2000 Server Bible by Jeffrey R.S shapiro and Jim Boyee IDG Books India.
- 4) Unix Administration Handbook Evi Nemeth, Garth Snyder Pearson Education
- 5) The complete reference Linux by Richard L. Peterson
Tata Mcgraw Hill Publication

Term work :

Term work consists of minimum 12 experiments on a above topics, There must be at least one experiment on every topic

B.E. (INFORMATION TECHNOLOGY) PART – I**5. Elective I****i). Embedded & Real Time System****Lectures : 4 Hrs****Theory : 100 Marks****1.Introduction to Embedded system :****4 hrs.**

An embedded system , Processor in the System, Other Hardware Units, Software embedded into a System, Exemplary Embedded Sytesm, Embedded System On-Chip (SOC) and in VLSI Circuit.

2.Architecture and Design of an Embedded System :**4 hrs.**

Architecture Styles, Architecture of Card Verification system, Practices followed in Design, Embedded software development tools

3.Process and memory organization :**6 hrs.**

Structural Units in a processor, Processor Selection for an Embedded System, Memory Devices, Memory selection for an Embedded system, Allocation of memory to program segment, blocks and memory map of a System, Direct Memory Access, Interfacing Process, Memories and I/O Devices, Interprocess communication (IPC).

4.Device Drivers and Interrupts Servicing Mechanism :**6 hrs.**

Device Drivers, Parallel Port Device Drivers in a System, Serial Port Device Drivers in a system , Device Drivers for Internal Programmable Timing Devices, Interrupt Servicing (Handling) Mechanism, Context and the Periods for Context-Switching, Deadline and Interrupt, Latency.

Section - II**5. Basic Real- Time Concepts :****5 hrs.**

Terminology, Real Time design Issues, Example, Real –Time systems, brief history, Language issues: Language features, commonly used programming languages, Software Life cycle : phases of the software life cycle Nontemporal Transitions in the software life cycle, Spiral Model.

6. Real Time specification and design Techniques :**7 hrs.**

Natural Languages, Mathematical specification, flowcharts, structure charts, Pseudocode and programming design languages, finite state Automata , Data flow diagram petrinets, Warnier –Orr Notation, State charts Sanity in using graphical Techniques.

7. Real Time Kernals :**4 hrs.**

Plotted Loops systems, phase /state driven code, co-routines, Interrupt –Driven system foreground/Background systems, Full featured Real time operating systems, POSIX.

8. Real Time Applications :**4 hrs.**

Real time systems on complex systems, real time data bases, real time image processing, real time process control.

Text Books

- 1) Emebeded systems – Rajkamal (TMH)
- 2) Embeded Real Time Systems programming – Sriram V Lyer(TMh), Pankaj Gupta
- 3) Real Time Systems – C. M. Krishna, K. G. Shin
- 4) Real Time Systems Design & Analysis – An Eryineer’s Hardware- P.A.Laplante

B.E. (INFORMATION TECHNOLOGY) PART – I**5. Elective I****2. Artificial Neural Networks****Lectures : 4 Hrs****Theory : 100 Marks****Section – I**

- 1) Introduction :** **4 hrs.**
Biological neuron, Models of artificial neural networks, neural processing, neural network learning rules,
- 2) Learning & adaptation :** **5 hrs.**
Classification Neural learning rules-Hebbian, perceptron, Delta, Widrow Hoof, Winner take all outstar learning rule.
- 3) Perceptron :** **4 hrs.**
Discrete perceptron as a classifier, Decision and discriminant functions, Linearly non separable patterns. Perceptron training for two class and multiclass dichotomizer.
- 4) Multilayer networks :** **4 hrs.**
Delta learning rule for multiperceptron layer, Generalized Delta learning rule, Feed forward recall and error back-propagation, Training algorithm.
- 5) Performance :** **4 hrs.**
Madeline, Network pruning, Marchands, Neural tree and filing algorithm, Prediction network.

Section – II

- 6) Unsupervised learning :** **5 hrs.**
Winner take all networks, Hamming networks, Max net, competitive learning K-means clustering and LVQ algorithms, Adaptive resonance theory, ARTI, ALGORITHM, SELF ORGANIZING Kohanens map, Naocognitron.
- 7) Associative memories :** **5 hrs.**
Noniterative procedures for association hop field networks, Discrete Hop field Networks storage capacity of Hop field networks. Continious Hop field networks. Brain state in a box (BOB) networks boltzmann machines Hetero associations.
- 8) Optimization techniques :** **5 hrs.**
Optimization using Hop field networks. Traveling salesperson problem, Iterated gradient descent techniques. Simulated annealing technique, Random search technique genetic algorithm for optimization problems.
- 9) Application of ANN :** **4 hrs.**
Character recognition, Speech recognition, Signature verification application, Human face recognition.

Text Books

- 1) Introduction to Artificial Neural Systems – Zurada (JAICO)
- 2) Elements of Artificial Neural Networks – Mehrotra, Hohan, Ranka (PENRAM)
- 3) Introduction to Artificial Neural Networks – B. Yegnanarayana (PHI)

B.E. (INFORMATION TECHNOLOGY) PART – I**5. Elective I****ii) Discrete event system simulation modeling****Lectures : 4 Hrs****Theory : 100 Marks****Section – I**

1.Introduction to simulation : **4 hrs.**
Need of simulation, Advantages and disadvantages, Applications of simulation, Generic structure of simulation models.

2.General Principles of simulation and simulation softwares : **6 hrs.**
Concepts in discrete event simulation, list processing. Examples of simulation : queuing system, inventory system, Historical review of simulation softwares, simulation in C++, Simulation in GPSS, Simulation in CSIM, Simulation packages, current trends in simulation softwares.

3.Input and Output modeling : **4 hrs.**
Collecting data and identifying, parameter estimation, goodness of-fit tests, Input models and their selection, stochastic nature of output data, performance measures and estimation, termination of simulation, Output analysis for steady state simulations.

4.Verification and validation of simulation models : **6 hrs.**
Model building verification, calibration and validation.

Section – II

5.Simulation models : **8 hrs.**
a) Statistical models
Terminology and concepts, useful statistical models, Discrete and continuous distributions poisson processes.
b) Queuing Models
Characteristics of queuing systems, Notations, performances measuring parameters of queuing systems, steady state behavior of infinite and finite population Markov models, Networks of queues.

6.Finite state Machines, Petrinet as simulation Model, colored petrinets. **4 hrs.**

7.Simulation of computer systems : **8 hrs.**
Simulation tools: process orientation, Event orientation, Modeling the input, High level computer system simulation, CPU simulation, Memory simulation.

Text Book

- 1.Discrete Event System Simulation
By Jerry Banks, John Carson Etc, Pearson Education Asia, Low price edition, Third edition
- 2.Flexible Manufacturing systems – Performance Modeling and analysis
By Y. Narhari and Vishwanadham, PHI Publication (For chapter No. 6)

Ref Books

- 1) Simulation, Modeling and analysis by Law and Kelton , 2nd edition , MGH Publication

B.E. (INFORMATION TECHNOLOGY) PART – I

6. Project - I

Practicals : 4 hrs/week

Term Work: 25 Marks

Orals : 50 Marks

The project work is to be carried out in two semester of B.E Information Technology. The project should be undertaken preferably by group of 4-5 students who will jointly work and implement the project in the two semesters.

In Semester I, The group will select a project with the approval of the Guide (staff member) and submit the name of the project with a synopsis of the proposed work of not more than 02 to 08 pages before second week of August in the academic year. The group expected to complete details system design analysis data flow design, data structure layout file design Procurement of Hardware and/or software requirements etc. at the semester –I as a part of the term work submission in the from of a join report.

The term work assessment will be done jointly by teachers, appointed by Head of the Institution..

The oral examination will be conducted by an internal and external as appointed by the University



SHIVAJI UNIVERSITY, KOLHAPUR
(Introduced from June, 2005)
B.E. (INFORMATION TECHNOLOGY) PART – II

1. Software Testing & Quality Assurance

Lectures : 4 Hrs

Practicals : 2 Hrs/Week

Theory : 100 Marks

TW : 25 Marks

OE : 50 Marks

Section – I

- 1) Software Measurement : 6 hrs.**
Measurement in software engineering, Classifying software measures, applying the framework, software measurement validation.
- 2) Software metrics data collection : 6 hrs.**
Definition, storing, extraction and collection of data, analyzing software measurement data analyzing results of experiments, simple analysis techniques, more advanced methods, Overview of statistical test.
- 3) Software Engineering Measurement : 6 hrs.**
Size: software size, length, reuse, functionality, complexity.
Structure: Types of structure measure, control flow structure, Modularity and information flow attributes, Object oriented metrics, Data structures.

Section – II

- 4) External product attributes : 4 hrs.**
Modeling software quality, Measuring aspect of quality
- 5) Software reliability : 6 hrs.**
Basics of reliability theory, Software reliability problem, Parametric reliability growth models, Predictive accuracy, Importance of operational environment, Wider aspects of software reliability.
- 6) Making process predictions : 6 hrs.**
Goal estimates, Cost estimation: problems and approaches, Models of effort and cost, Problem with existing modeling methods, Dealing with problems of current estimation methods, Implications for process predictions.
- 7) Empirical research in software engineering : 4 hrs.**
Investigating products, Investigating resources, Investigating processes, Measurement today and tomorrow.
(Minimum 8 to 10 Experiments to be conducted on above topics)

Text Books:

- 1) Software Metrics – A rigorous & practical approach
- Norman Fenton, Shari Lawrence Pfleeger (THOMSON – BROOKS)
- 2) Software Testing – Renu Rajani, Pradeep Oak
- 3) Software Requirement & Estimation – Swapna Kishore, Rajesh Naik.

B.E. (INFORMATION TECHNOLOGY) PART – II**2. IT Business Methodology****Lectures : 4 hrs/week****Theory: 100 Marks****1) Introduction ERP :****4 hrs.**

Overview, accommodating variety, integrated management information, integration, supply chain and resource management, integrated data model scope, Technology and benefits of ERP & the modern enterprise.

2) Business modeling for ERP :**7 hrs.**

Overview, concept, significance and principles of business engineering, BRP, ERP and IT business engineering with IT, ERP and management concerns, building an MIS, Business as a system, core process in a manufacturing company, entities for data model in a manufacturing company, extended ERP.

3) ERP implementation :**7 hrs.**

Overview, role of consultants vendors and users, customization, precautions, post implementation, option, ERP implementation methodology and guidelines for ERP implementation, Mercedes Bens, Keethin Industire, Bull Electronics Angers Plant manufactures, Twentieth Centaury companies, A meritech Essar steel, jindal Iron and steel company Ltd. Goderaj soaps and associate companies, IREDA, comparison and conclusions.

4) Getting started on Basic SAP R/3 Elements :**5 hrs.**

The client – or SAP customer, the clients representative, the SAP consultant, the SAP R/3 business application software architecture, financial accounting and controlling (FI/CO) modules, the sales and distribution (SD) module, the materials management (MM) module, the plant maintenance (PM) and service management, the production planning (PP) module, the project system (PS) module, the human resources (HR) module, the SAP retail model, industry solutions (IS) modules, the ASAP roadmap

Section II**1) Electronic commerce environment and opportunities :****4 hrs.**

Background, The electronic commerce environment, electronic marketplace technologies, conclusion.

2) Modes of Electronic commerce :**5 hrs.**

Overview, Electronic data interchange, Migration of Open EDI, Electronic commerce with WWW/internet, Commerce Net Advocacy, Web commerce going forward.

3) Approaches to Safe Electronic Commerce :**5 hrs.**

Overview, Secure transport protocols, Secure transactions, secure electronic payment protocol (SEEP), Secure electronic Transaction (SET), Certificates for Authentication, security on web servers and enterprise Networks, conclusion.

4) Electronic cash and Electronic payment :**5 hrs.**

Internet monetary payment and security requirements, payment and purchase order process, online electronic cash.

Text book

1) Enterprise resource planning by Vinod Kumar Garg & N. K. Venkita Krishna

2) Enterprise resource planning by AlexIs Leon.

3) Web commerce Technology Handbook by Daniel minoli & Emma minoli.

B.E. (INFORMATION TECHNOLOGY) PART – II**3. Mobile Technology****Lecture:4 hrs week****Theory: 100 Marks****Section - I**

- 1. Introduction to wireless communication :** **3 hrs.**
Need and Application of wireless communication. Wireless Data Technologies Market for mobile.
- 2. Wireless transmission :** **5 hrs.**
Frequency for radio transmission signal antennas, signal propagation Multiplexing Modulation, Spread and Cellular systems.
- 3. Medium Access Control :** **4 hrs.**
Specialized MAC, SDMA, FDMA, TDMA, and CDMA
- 4. Telecommunication Systems :** **5 hrs.**
GSM, DECT systems –Architecture and protocols, Tetra frame structure, UMTS basic architecture and UTRA modes.
- 5. Wireless LAN :** **5 hrs.**
Introduction Infrared v/s Radio transmission Infrastructure and ad-hoc network IEEE, 802.11, HIPERLAN, Blue Tooth.

Section – II

- 6. Wireless ATM :** **6 hrs.**
WATM services, Location Reference model function radio access layer handover Location management, Addressing, Mobile QoS, Access point control protocol.
- 7. Mobile Network Layer :** **2 hrs.**
Mobile IP, DHCP.
- 8. Mobile Transport Layer :** **4 hrs.**
TCP, Fast and selective retransmission and recovery Transaction oriented TCP.
- 9. Support for Mobility :** **4 hrs.**
File systems, World wide web and Wireless Application Protocol with example applications
- 10. Wireless Telephony Applications :** **3 hrs.**
Overview of the WTA Architecture, The WTA client Framework, The WTA Server and security, Design considerations, Application Creation Toolbox.

Books :

1. Mobile Communications- Jachan Schiller (Addison-Wesley)
2. Wireless LAN – Pater T. Davis Carig R. Mc.Guffin (MGH International Edn.)
3. The Wireless Application Protocol – Sandeep Sighat Jari Alvinen and group (Addison Wesley)
4. Professional WAP – Chaires Archart And group (SDN)

B.E. (INFORMATION TECHNOLOGY) PART – II**4. Web Technology**

Lecture : 2 hrs week
Practicals : 4 hrs week

T/W : 25 Marks
POE : 50 Marks

1) XML :**5 hrs.**

- a) An Xml primer History of xml, Benefits of xml, components of xml.
- b) parsing xml: Parsing methodology, SAX API, Java API for XML parsing.
- c) Document object Model
 Defining DOM, DOM core level-I, creating document object, Node interface, Document interface , Element Interface, Attr interface, additional interfaces.
 Dom level –II
- d) XSL extensible stylesheet Language
 The XSL language, Format of stylesheet, working with xsl : template, working with xsl: output using xsl processors, pattern matching, expressions, precedence rule, Advances of XSL.

2) Java servelet and JSP :**6 hrs.**

- a) Introduction to servelet
 servelet, the advantages of servelet, Basic servelet structure, compiling and installing servelet, invoking servelet, The servelet lifecycle, Initialization parameters, web clients.
- b) Handling the client request
 The roll of form data, Reading form data from servelet, Reading request headers from servelet, HTTP 1.1, request headers, Accessing the standard CGI variables.
- c) Generating the server response
 HTTP response header, setting response header from servelet, HTTP 1.1 response header and their meaning, persistent servelet state and auto reloading pages.
- d) Handling cookies
 Benefits of cokies, problems of cookies, The servelets cookies API, Basic cookies utilities.
- e) Session tracking
 The need for session tracking session tarcking API.
- f) JDBC and database connection pooling
 Basic step in using JDBC, some JDBC utilities connection pooling, sharing connection pool
- g) Introduction to JSP
 Purpose of jsp, Scripting elements JSP expressions, JSP scriptlets, JSP, declaration preclefired variables, JSP page directives, the import attribute, the context attribute, session attribute, XML syntax for directives.

3) ASP :**6 hrs.**

- a) Introduction to ASP, Benefits of ASP, How to use ASP , What ASP can do, How ASP request differs from HTML request.
- b) Intrinsic ASP objects:
 - 1) The response object:
 Introduction to ASP object, response objects,sending text with embedded quotes, using variables, mixing HTML and response code, writing HTML with script, The response cookies collection, response add header response redirect.

- 2) The request objects
Obtaining information from browser, request server variables collection, Request cookies collection, Request query string collection, introduction to HTML forms form collection , working with forms.
- 3) Application and server objects
Introduction to threads, application variables, application lock/unlock methods, How to use application variables, The server object.
- 4) Session objects
What is session? global.ASA file, session and global.asa file, session variables.
- 5) Accessing database with ASP and ADO
Introduction to ADO, Connection object, recordset object, The field object, ADO data types, accessing data with ADO.

4) Web services :

5 hrs.

- a) Introduction to web services, Background, Services, web services, web services application opportunities, service oriented architecture and web services, web services application scenario.
- b) Simple object access protocol (SOAP)
SOAP introduction, interaction, SOAP modeling SOAP Encoding, SOAP binding.
- c) Web services description language
What is WSDL?, Web services invocation & WSDL, Web services Description details, Service Description through WSDL.
- d) Registers :
Universal description, Discovery and Inteqratron, What is UDDI, UDDI nomenclature, care UDDI, Services publication, services discovery.
- e) Remote procedure call & messaging
Synchronous, Web services, Asynchronous, web services.

Term work :

Term work consists of minimum 12 experiments on above topics, There must be at least one experiment on every topic

[

Reference books

- 1) XML development with Java 2 - By Michal Daconta and AI saqanich
SAMS Tech media publication
- 2) The XML Handbook - Charls F. Goldfarb Addison Wesley (Pearson Education)
- 3) Core servlet and Java server pages - Marrty Hall (sun publication)
- 4) Mastering Active server pages 3 - By Russell Jones (BPB sybex publication)
- 5) Web Services – An Introduction – By B.V. Kumar , S.V. Subrahmanya
Tata McGraw Hill Publication

B.E. (INFORMATION TECHNOLOGY) PART – II**5. Elective – II****i) Intelligent Systems****Lectures : 4 Hrs****Theory : 100 Marks****Section – I**

- 1) Artificial Intelligence and expert systems : 5 hrs.**
- Concepts and Definitions of Artificial Intelligence.
 - Artificial Intelligence Versus Natural Intelligence.
 - Types of Knowledge-Based Decision Support Systems.
 - Basic Concepts of Expert Systems.
 - Structure of Expert Systems
 - The Human element in Expert System.
 - How Expert Systems Work
 - Benefits of Expert Systems.
 - Types of Expert Systems.
 - Expert Systems and the Internet/Intranets/Web
- 2) Knowledge Acquisition and validation. 6 hrs.**
- Knowledge Engineering
 - Scope of Knowledge
 - Difficulties in Knowledge Acquisition
 - Methods of Knowledge Acquisition : An Overview
 - Tracking Methods
 - Expert Driven Methods
 - Machine Learning: Rule Induction, Case-Based Reasoning, Neural Computing, and Intelligent Agents
 - Knowledge Acquisition from Multiple Experts
 - Analyzing, Coding, Documenting and Diagramming
 - Knowledge Acquisition and the Internet/Intranets
- 3) Knowledge Representation. 4 hrs.**
- Introduction
 - Representation in Logic and Other Schemas
 - Semantic Networks
 - Production Rules
 - Frames
 - Multiple Knowledge Representation
 - Experimental Knowledge Representations
 - Representing Uncertainty: An Overview
- 4) Inference Techniques. 2 hrs.**
- Reasoning in Artificial Intelligence
 - Inferencing with Rules: Forward and Backward Chaining
 - The inference Tree
 - Inferencing with frames
 - Model-Based Reasoning
 - Case-Based Reasoning
 - Interfancing with Uncertainty
 - Representing Uncertainty
 - Probabilities and Related Approaches
 - Theory of Certainty (Certainty Factors)
 - Approximate Reasoning Using fuzzy Logic

Section – II

- 5) Advanced Intelligent Systems. 8 hrs.**
- a) Neural Computing and Machine Learning
 - b) Neural Network Fundamentals
 - c) Neural Network Application Development
 - d) Data Collection and Preparation
 - e) Neural Network Architecture
 - f) Neural Network Preparation
 - g) Training the network
 - h) Learning Algorithms
 - i) Back propagation
 - j) Testing
 - k) Implementation
 - l) The Self-Organizing Map: An Alternative Neural Network Architecture
 - m) Benefits of Neural Networks
 - n) Neural Networks and Expert System
- 6) Application of Advanced Intelligent Systems 6 hrs.**
- b) Overview of ANN Application Areas
 - c) Credit Approval with Neural Networks
 - d) Stock Market Prediction System with Modular Neural Networks
 - e) Integrated ANNs and Expert Systems
 - f) Optimization Algorithms
 - g) Fuzzy Logic
 - h) Intelligent Systems Integration
 - i) Data Mining and Knowledge Discovery in Databases
- 7) Intelligent S/W Agents and Creativity. 6 hrs.**
- a) Intelligent Agents: An Overview
 - b) Characteristics of Agents
 - c) Single Task
 - d) Why Intelligent Agents?
 - e) Classification and Types of Agents
 - f) Internet-Based Software Agents
 - g) Electronic Commerce Agents

Text books :

Decision support & Intelligent systems 6th Edition

- By Efram Turban, Jay E. Aronson

Artificial Intelligent

- By Patric H. Winston

B.E. (INFORMATION TECHNOLOGY) PART – II**5. Elective – II****ii) Multimedia Storage & Communication****Lectures : 4 Hrs/Week****Theory : 100 Marks****Section – I****1) Introduction :****4 hrs.**

Types of media, what is multimedia, introduction to making multimedia, applications of multimedia.

2)Audio :**4 hrs.**

Basic sound concept, Multimedia system sound, MIDI versus digital audio, Audio file formats, Adding sound to multimedia project, professional sound, National interchange file formats.

3) Image and Animation :**6 hrs.**

Still images, Image file formats, Image synthesis, Image analysis , Principals of animation, computer based animation, JPEG, & MPEG standards.

4) Video :**6 hrs.**

Using video, Video signal representation, different video broadcasting standards, shooting & video editing tools video recording formats, Digital video.

Section - II**5) Multimedia Storage Devices :****6 hrs.**

Compact Disc, construction details, recording and reproducing data from CD, CDROM, DVD technology, specifications of DVD, comparison between CD and DVD.

6) Multimedia Communications :**4. hrs.**

Introduction, Multimedia Information representation, multimedia networks, application and networking terminology.

7) Multimedia Application :**4 hrs.**

Introduction, Media preparation, Media composition, Media integration, Media communication, Media entertainment.

8) Multimedia on web :**6 hrs.**

Multimedia for the web, plugins and delivery vehicles, VRML, Text, images, sound and animation for web.

Text Books :

- 1)Multimedia – Making it work 5th edition by Tag Vaughan (TMGH)
- 2)Multimedia Communication – Pearson Education Fred Halsall.
- 3)VRML exploring Virtual worlds on internet – Walter Goralski, Mathew Poli.
- 4)Multimedia Computing communication & Application

B.E. (INFORMATION TECHNOLOGY) PART – II**5. Elective – II****iii) GIS and Remote Sensing****Lectures : 4 Hrs****Theory : 100 Marks****Section – I**

- 1) Map Language :** **4 hrs.**
Map as a model, classification of maps, spatial referencing system, map projections, commonly used map projections, grid systems, computer in map production, digital database in a GIS, linkage of GIS to remote sensing.
- 2) Remote sensing – basic principles :** **7 hrs.**
Electromagnetic remote sensing, Energy sources, atmospheric interactions with electromagnetic radiations, energy interactions with Earth's surface materials, The radar principle, factors affecting microwave measurements, Radar wavebands, SLAR systems, Sar, Interpreting Sar images, Geometrical characteristics, Satellite system parameters, sensor parameters, imaging sensor systems, Earth resources satellite, Meteorological satellites, satellites carrying Microwave sensors, OCEANSAT-1 (IRS-P4), IKONOS satellite series. Types of pictorial data products, Image interpretation strategy, image interpretation process, overview of image interpretation equipments.
- 3) Fundamentals of GIS :** **5 hrs.**
Roots of GIS, Overview of Information system, the four Ms, GIS definition and terminology, GIS queries, GIS architecture, Models of GIS, framework for GIS, GIS categories, levels/scales of measurement.
- 4) Spatial data modeling :** **5 hrs.**
Stages of GIS data modeling, Graphic representation of spatial data, raster GIS models, vector GIS models.

Section – II

- 5) GIS data management :** **5 hrs.**
Database management systems, GIS data file management, database models, storage of GIS data object based data models, temporal topology, organizational strategy of DBMS in GIS.
- 6) data input and editing :** **5 hrs.**
The data stream, data input models, data input methods, GPS for GIS data capture, data editing.
- 7) Data quality issues :** **5 hrs.**
Components of data quality, accuracy, precision and resolution, consistency completeness, sources of error in GIS, GIS output, modeling errors and error evaluation.
- 8) Data analysis and modeling :** **5 hrs.**
Format conversion, Data medium conversion, spatial measurement methods, buffering techniques, overlay analysis, modeling surfaces, modeling networks, Integration of remote sensing and GIS, Urban & Municipal applications.

References :

- 1) "Remote sensing & Geographical Information System" by M.Anji Reddi. BS Publications, second edition.
- 2) "The GIS Book" by George B.Korte, Onward Press Thomson learning 5th edition.
- 3) "Principles of Geographical Information Systems" by peter A.Burrough and McDonell (Oxford University Press, 1998)

B.E. (INFORMATION TECHNOLOGY) PART – II

6. Project - II

Practicals : 6 hrs/week

Term Work: 50 Marks
Orals: 100 Marks

The group will continue to work on the project selected during the first semester and submit at the end of second semester.

1. The workable project.
2. The project report in the bound journal complete in all respect with the following : -
 - i) Problem design and specifications.
 - ii) System definition – requirement analysis.
 - iii) System design
 - iv) System implementation – code documentation-dataflow diagram-algorithm.
 - v) Test results and procedure test report.

Term work will be jointly assessed by a panel of teachers as appointed by head of the institution.

Oral examination will be conducted by internal and external examiners as appointed by the University.

SAWANT S. P.

BIRJE SR/JC

K:\eback\newsyllabus\engineering\B.E\B.E.(Information Technology)\BE(Infn Tech) - 05.doc/ birje