SYLLABUS PRESCRIBED FOR
BACHELOR OF ENGINEERING
INFORMATION TECHNOLOGY
SEMESTER PATTERN (CREDIT GRADE SYSTEM)

SEMESTER : SEVENTH

7IT 01 **DIGITAL SIGNAL PROCESSING**

Unit I: Discrete óTime Signals and Systems: Introduction to DSP, Advantages, basic elements of DSP system, sampling theorem, A/D, D/A conversion, quantization. Elementary discrete-time sequences. Discretetime systems: description, representation, classification (linear, time-invariant, static, casual, stable)

Unit II: Analysis of DTLTI systems: The convolution sum, properties of convolution, Analysis of causal LTI systems, stability of LTI systems, step response of LTI systems, difference equation, recursive & non recursive discrete-time systems, solution of difference equations, Impulse response of LTI recursive system. Correlation of discrete time signals.

Unit III: z- Transform and Analysis of LTI Systems: Definition of z-Transform, properties, rational z-Transforms, evaluation of the inverse z- Transforms, analysis of linear time invariant systems in z-domain, transient and steadystate responses, causality, stability, pole-zero cancellation, the Schur-Cohn stability test

Unit IV: Fourier Transforms, the DFT and FFT: Definition & properties of Fourier transform, relation with ztransform. Finite duration sequences and the discrete Fourier transform(DFT), properties, circular convolution, Fast algorithms for the computation of DFT: radix-2 and radix-4 FFT algorithms

Unit V: Design of Digital Filters: Classification of filters: LP, HP, BP, FIR and IIR filters, filter specifications. Design of FIR filters using Windows and by Frequency sampling methods. Design of IIR filters from Analog filters using approximation of derivatives, Impulse invariant transformation, Bilinear transformation and Matched z-Transformation, Commonly used Analog filters and IIR Filter design example

Unit VI: Realization of Discrete-Time systems: Structures for realization of Discrete-Time systems, realization of FIR systems: Direct Form, Cascade Form, Frequency sampling and Lattice structures. Realization of IIR filters: Direct Form, Signal flow graph and Transposed structures, Cascade form, Lattice and Lattice-ladder. Realization for IIR systems.

TEXT BOOK :

J G Prokis and D G Manolokis, õDigital Signal Processing: Principles Algorithms and Applications (Pearson Education)

REFERENCE BOOKS:

1. S.Salivahanan, A Vallavaraj,C Gnanapriya õDigital Signal Processingö (TaTa McGraw Hill)
1. S K Mitra: õDigital Signal Processing: A Computer-Based Approachö (TaTa McGraw Hill)
2. E C Ifeacthor and B W Jervis õDigital Signal Processing A Practical Approachö (Pearson Education)
3. A V Oppenheim, R W Schafer with J R Buck õDiscrete Time Signal Processingö(PHI)

7IT02 **OBJECT ORIENTED ANALYSIS AND DESIGN**

UNIT-I: Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, Software Development Life Cycle.

UNIT-II: Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

UNIT-III: Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages, Instances, Object Diagram

UNIT-IV: Basic Behavioral Modeling-I: Interactions, Use cases, Use case Diagrams, Interaction diagrams, Activity Diagrams.

UNIT-V: Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT-VI: Architectural Modeling: Component, Deployment, Collaborations, Component diagrams and Deployment diagrams.

TEXT BOOK:

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education.

REFERENCE BOOKS:

1. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.
2. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
3. Pascal Roques: Modeling Software Systems Using UML2, WILEY-Dreamtech India Pvt. Ltd.
4. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill Companies.

5. Mark Priestley: Practical Object-Oriented Design with UML, TATA McGrawHill

6. Appling UML and Patterns: An introduction to Object ó Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.

7IT03   WEB TECHNOLOGY

Unit –I : Web Essentials: The internet, Basic Internet Protocols, The World Wide Web, HTTP Request Massage, HTTP Response Massage, Web Clients, Web Servers, **Markup Languages: XHTML 1.0,** Basics of XHTML, Fundamentals HTML Elements, Relative URLs, Lists, Tables, Frames, Forms, Defining XHTMLø abstract syntax: XML, Creating HTML Documents.

Unit – II: Style Sheets: Introduction to Cascading Style Sheets, CSS Features, CSS Core Syntax, Style Sheets and HTML, Style Rule Cascading and Inheritance, Text Properties, CSS Box Model, Normal Flow Box Layout, Beyond the Normal Flow

Unit –III: Client-Side Programing: Introduction to Java Script™ Language, JavaScript in Perspective, Basic Syntax, Variables and Data types, Statements, Operators, Literals, Functions, Objects, Arrays, Built-in Objects, JavaScript Debuggers, **Host Objects:** Introduction to the Document object Model, Intrinsic Event Handling, Modifying Element Style, The Document Tree, DOM Event Handling, Accommodation Noncompliant Browsers, Additional Properties of Window

Unit-IV: Server-Side Programming : Java Servlets Servlet Architecture Overview, Servlet Generating Dynamic Content, Servlet Life Cycle, Parameter Data, Sessions, Cookies, URl Rewriting, Other Servlet Capabilities, Data Storage, Servlet and Concurrency,

Unit-V: Representing Web Data: XML Documents and Vocabularies, XML versions and XML Declaration, XML Namespaces, JavaScript And XML:Ajax , Dom-Based XML Processing, Event-Oriented parsing: SAX, Transforming XML Documents, Selecting XML Data : XPath, Template-Based Transformation: XSLT, Displaying XML Documents in Browsers, Introduction to Java Server Pages, JSP and Servlets, Running JSP Applications, Basic JSP, JavaBeans Classes and JSP, Tag Libraries and Files,

Unit-VI: Web Services: Web Service Concepts, Writing a Java Web Service, Writing a Java Web Service Client, Describing Web Services: WSDL, Representing Data Types :XML Schema, Communicating Object Data :SOAP,

TEXT BOOK:

1. Web technologies by Jeffrey C. Jackson (Pearson)

REFERENCE BOOKS:

1. The Web Warrior guide to Web Programming by Xue Bai, Micheal Ekedahl, Don Gosselin (CENGAGE Learning)

2. Internet Protocols by Subrata Goswami (Springer India)

3. Dietel and Dietel: WWW: How to Program, (LPE)

4. Dustin R Callaway: Inside Servlets (LPE)

7 IT 04   REAL TIME & EMBEDDED SYSTEMS

UNIT I: Introduction to embedded systems, Processor in the system, Hardware units required in the exemplary cases, Software embedded into a system. Final Machine implement able software for a product, Software in Processor specific assembly language and high level language, Device drivers device management using an operating systems, Software design for scheduling multiple tasks and devices using RTOS, Embedded SoC and in VLSI circuits.

UNIT II: Structural units of the processor, Allocation of memory to program segment and blocks, memory map of the system, Memory blocks for different data sets and structures, serial communication using I2C, CAN and advanced I/O buses between the networked multiple devices, Device drivers, Virtual Devices, Device drivers for parallel port, serial and timing devices, Context and periods for context switching, deadline and interrupt latency.

UNIT III: Software programming in assembly language and C, Use of data structures, Queues, Stacks, Lists and Trees, Function pointers, Function queues and ISR queues, Queues for implementing protocol for a network, Queuing of functions on interrupts, Use of FIFO queues, Stacks, Lists and Ordered Lists, Embedded programming

UNIT IV: Modeling process, Use of dataflow & control data flow graphs, Programming model for event controlled or response time constraint, Real time programs, Inter process Communication and Synchronization, Multiple processes in an application, Sharing data by multiple tasks, use of finite states machine model & Petri net Model, Process, Tasks, Threads.

UNIT V: Use of Semaphores for a task or for Critical section of code, Mutex & P & V, Priority inversion problems & deadlock situations IPC issues, Use of Semaphore flags or Mutex as resource key, use of message queues, mailboxes, pipes, virtual sockets, RPCs.

UNIT VI: Introduction to RTOS, OS Services, RTOS Services, Schedule management for multiple tasks in Real Time, Handling of interrupt source call, RTOS task scheduling models, Cooperative Round Robin Scheduling using a Circular Queue of ready tasks and using and Ordered list as per precedence constraints, Cycling scheduling in Time Sharing, Preemptive scheduling, Critical section service by preemptive scheduler, fixed Real Time scheduling, Precedence assignment in Scheduling algorithms. Performance metrics, IEEE Standard POSIX 1003.1B, fifteen-point÷ strategy for Synchronization, Embedded Linux Kernel.

PRACTICALS : Minimum 12 experiments based on above syllabus.

TEXT BOOK:
1. Rajkamal Embedded Systems, Architecture, Programming & Design, TMH.

REFERENCE BOOKS:
1. Real Time Systems, Jane W. S. Liu, Pearson Education
2. Embedded System Design, A Unified Hardware/Software Introduction, Frank Vahid, Tony Givargis, John Wiley & Sons P Ltd

PROFESSIONAL ELECTIVE - I
7IT05 (1) DISTRIBUTED DATABASE MANAGEMENT SYSTEM

UNIT-I: Introduction to DDBS: Introduction, Promises of DDBs, Problem areas. Overview of Relational DBMS: RDBMS concept, Normalization, Integrity Rules. Review of Computer Networks: Data Communication Concepts, Types of Network, Protocol Standard. (8)

UNIT-II: Distributed DBMS architecture: DBMS standardization, Architectural Models, Distributed DBMS arch. Distributed Database Design: Alternative Design Strategies, Distributed Design issues, Fragmentation, Allocation Semantic Data Control: View Management, Data Security, Semantic Integrity Control. (8)

UNIT-III: Overview of Query Processing: Problem & objectives of Query Processing, Characteristics of Query processors, Layers of Query processing. (9)

UNIT-IV: Distributed Transaction management and Concurrency control: Definition, Properties and types of Transaction. Distributed Concurrency control: Serilizability, Taxonomy, Locking based concurrency control algorithms, Deadlock management. (9)

UNIT-V: Distributed DBMS reliability: Reliability concepts and measures, Failures and Fault tolerance in distributed systems, Failures in DDBMS, Local reliability protocols, dealing with site failures. (8)

UNIT-VI: Distributed Object Database Management Systems: Fundamental, Design and Architectural issues of ODBMS, Current issues: Data Delivery Alternatives, Dataware housing. World wide web, Mobile databases. (8)

TEXT BOOKS :
1. M. Tamer Oizsu and Patrick Valdurlez : Principles of Distributed Database Systems, 2nd ed. (Text Book) Person Education, LPE.
2. Ceri and Palgetti : Distributed Database System-(Reference Book) TMH.

PRFESSIONAL ELECTIVE - I
7IT05 (2) MODELING & SIMULATION

UNIT I: **System Models and System Studies**
Basic concepts of systems ,System Environment , system modeling ,Types of Models, Principles used in modeling, Corporate models, Types of System Study-analysis, design and postulation of systems.

UNIT II: **Basic Concepts and continuous systems**
Monte Carlo Method ,Numerical Computation Technique for Continuous Models, & Discrete Models, Distributed log models, Cobweb Models , Analog and hybrid computers CSMP III.

UNIT III: System dynamics, probability concepts and basic principles of discrete simulation Growth and decay models system dynamics diagrams examples. Discrete Probability functions , Continuous Probability functions , Measures of Probability functions , Numerical on evaluation of Continuous Probability functions, Continuous Uniformly Distributed Randam Numbers ,Computer Generation of Random number .

UNIT IV: Simulation of Queueing System and PERT Network
Simulation of Queueing systems: Rudiments of queueing theory, simulation of a single server queue, Simulation of a two-server queue, simulation of more general queues.
Simulation of a PERT Network: Network model of a project, Analysis of an activity network, critical path computation, and uncertainties in activity durations, simulation of an activity network.

UNIT V: Simulation of Inventory Control & Forecasting Design and Evaluation of Simulation Experiments
Inventory Control and Forecasting: Elements of inventory theory, More complex inventory models, Simulation example-1, Generation of Poisson and Erlang variates, Simulation example-2, Forecasting and regression analysis.

Design and Evaluation of Simulation Experiments: Length of simulation runs, variance reduction techniques,Experimental layout, validation, summary an conclusions.

UNITVI: Simulation Languages and Introduction to GPSS

Different special purpose languages used for continuous and discrete systems and comparison-factors affecting the selection of discrete system simulation language-comparison of GPSS and SIMSCRIPT. A detailed study of GPSS with examples.

TEXT BOOKS:
1. Groffrey Gordon õSystem Simulationö, IInd Edition, PHI Pvt. Ltd.,New Delhi-1987.
2. Narsingh Deo, õSystem Simulation with Digital Computersö PHI Pvt.Ltd., New Delhi.

REFERENCE BOOKS:
1. Shannon R.E., õSystem Simulation: The Art of Scienceö Prentice Hall, Englewood Cliffs, NY, 1975.
2. Hugh J. Watson, John H. Blackstone, Jr., õComputer SimulationöIInd Edition, John Wiley & Sons.

PRFESSIONAL ELECTIVE - I
7IT05 (3) ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

Unit-I: **Introduction to Artificial Intelligence:** The AI Problems, The Underlying Assumption, What is an AI Technique; **Problems, Problem Spaces, and Search,** Production Systems, Problem Characteristics , Production System Characteristics, Issues in the Design of Search Programs

Unit-II: **Heuristic Search Techniques:** Generate-and-Test, Hill Climbing, Best-first Search, A* Algorithm, Problem Reduction, AND-OR Graphs, The AO* Algorithm, Constraint Satisfaction, Means-ends Analysis,

Unit–III: **Knowledge Representation Issues:** Representations and Mappings, Approaches to Knowledge Representation, Issues in Knowledge Representation, The Frame Problem, **Predicate Logic:** Representing Simple Facts in Logic,
Representing Instance and *ISA* Relationships, Computable Functions and Predicates, Resolution, Natural Deduction **Representing Knowledge Using Rules,** Procedural Versus Declarative Knowledge, Logic Programming Forward Versus Backward Reasoning , Matching, Control Knowledge.

Unit –IV: **Symbolic Reasoning Under Uncertainty** Introduction to Nonmonotonic Reasoning , Logics for Nonmonotonic Reasoning, Implementation Issues, Augmenting a Problem-solver,

Implementation: Depth-first Search, Implementation: Breadth-first Search, **Statistical Reasoning** Probability and Bayesø Theorem, Certainty Factors and Rule-based Systems, Bayesian Networks, Semantic Nets, Frames.

Unit-V: **Understanding** What is Understanding?, Understanding as Constraint Satisfaction, **Natural Language Processing,** Syntactic Processing, Semantic Analysis, Discourse and Pragmatic Processing, Statistical Natural Language Processing, Spell Checking, **Common Sense** Qualitative Physics, Common Sense Ontologies.

Unit-VI: **Expert Systems** Representing and Using Domain Knowledge, Expert System Shells, Explanation, Knowledge Acquisition, **Fuzzy Logic Systems:** Introduction, Crisp Sets, Fuzzy Sets, Some Fuzzy Terminology, Fuzzy Logic Control, **Genetic Algorithms:** Significance of the Genetic Operators, Termination Parameters, Evolving Neural Networks.

TEXT BOOK:
Artificial Intelligence ó Elaine Rich, Kevin Knight, Nair (Third Edition) [Mc Graw Hill]

REFERENCE BOOKS.:
1. Introduction to Artificial Intelligence and expert system ó Dan W. Patterson
2. Expert System- Peter Jackson (Third Edition)
3. Introduction to Artificial Intelligence ó Rajendra Akerkar

PRFESSIONAL ELECTIVE - I
7IT05 (4) MULTIMEDIA TECHNOLOGIES

UNIT I: Multimedia Authoring and Data Representations: Introduction, Components of Multimedia, Hypermedia and Multimedia, Overview of Multimedia Software Tools, Multimedia Authoring and Tools: Multimedia Authoring, VRML. Graphics and Image Data Representations: Graphics/Image Data Types, 1-Bit Images, 8-Bit Gray-Level, Images, Image Data Types, Popular File Formats, GIF, JPEG, PNG, TIFF, EXIF, Graphics Animation Files, PS and PDF, Windows WMF, Windows BMP, Macintosh PAINT and PICT, X Windows PPM.

UNIT II: Color in Image and Video: Color Science, Color Models in Images, and Color Models in Video.Fundamental Concepts in Video: Types of Video Signals, Component Video, Composite Video, S-Video, Analog Video, NTSC Video, PAL Video, SECAM Video, Digital Video, Chroma Sub sampling , CCIR Standards for Digital Video, High Definition TV.

UNIT III: Basics of Digital Audio: Digitization of Sound, Digitization, Nyquist Theorem, Signal-to-Noise Ratio (SNR), Signal-to-Quantization-Noise Ratio (SQNR), MIDI: Musical Instrument Digital Interface, Hardware Aspects of MIDI, Structure of MIDI Messages, General MIDI, MIDI-to-WAV Conversion, Quantization and Transmission of Audio, Coding of Audio, Pulse Code Modulation, Differential Coding of Audio, Lossless Predictive Coding, DPCM, DM, ADPCM.

UNIT IV: Multimedia Data Compression: Lossless Compression Algorithms: Basics of Information Theory, Run-Length Coding, Variable-Length Coding (VLC), Dictionary-Based Coding, Arithmetic Coding, Lossless Image Compression. The JPEG Standard.

UNIT V: Basic Video Compression Techniques: Introduction, Video Compression Based on Motion Compensation, Search for Motion Vectors, H.261, Intra-Frame (I-Frame) Coding, Inter-Frame (P-Frame) Predictive Coding, Quantization in H.261, H.261 Encoder and Decoder, H.261 Video Bitstream Syntax, MPEG-1, Motion Compensation in MPEG-1, Major Differences from H.261

UNIT VI: Basic Audio Compression Techniques: ADPCM, Vocoders, Phase Insensitivity, Channel Vocoder, Formant Vocoder, Linear Predictive Coding, CELP. MPEG Audio Compression: Psychoacoustics, Equal-Loudness Relations, Frequency Masking, Temporal Masking, MPEG Audio, MPEG Layers, MPEG Audio Strategy, MPEG Audio Compression Algorithm, MPEG-2 AAC (Advanced Audio Coding).

TEXT BOOK:

Ze-Nian, Li, Mark S. Drew õFundamentals of Multimediaö (Pearson Education)

REFERENCE BOOKS :

1. Rajan Parekh õPrinciples of Multimediaö (Tata McGraw-Hill)
2. S.J.Gibbs & D.C.Tsichritzis õMultimedia Programmingö, Addison Wesley 1995
3. P.W.Agnew & A.S.Kellerman õDistributed Multimediaö, , Addison-Wesley 1996
4. C.A.Poynton, õA Technical Introduction to Digital Videoö Wiley 1996
5. F.Fluckiger, õUnderstanding Networked Multimediaö, Prentice-Hall 1995

7IT06   **DIGITAL SIGNAL PROCESSING - LAB:**
Minimum 8 experiments based on the syllabus of 7IT01.

7IT07   **WEB TECHNOLOGY - LAB:**
Minimum 8 experiments based on the syllabus of 7IT03.

7IT08   **REAL TIME EMBEDDED SYSTEMS - LAB:**
Minimum 8 experiments based on the syllabus of 7IT04.

7IT08   **REAL TIME & EMBEDDED SYSTEMS**

UNIT I: Introduction to embedded systems, Processor in the system, Hardware units required in the exemplary cases, Software embedded into a system. Final Machine implement able software for a product, Software in Processor specific assembly language and high level language, Device drivers device management using an operating systems, Software design for scheduling multiple tasks and devices using RTOS, Embedded SoC and in VLSI circuits.

UNIT II: Structural units of the processor, Allocation of memory to program segment and blocks, memory map of the system, Memory blocks for different data sets and structures, serial communication using I2C, CAN and advanced I/O buses between the networked multiple devices, Device drivers, Virtual Devices, Device drivers for parallel port, serial and timing devices, Context and periods for context switching, deadline and interrupt latency.

UNIT III: Software programming in assembly language and C, Use of data structures, Queues, Stacks, Lists and Trees, Function pointers, Function queues and ISR queues, Queues for implementing protocol for a network, Queuing of functions on interrupts, Use of FIFO queues, Stacks, Lists and Ordered Lists, Embedded programming

UNIT IV: Modeling process, Use of dataflow & control data flow graphs, Programming model for event controlled or response time constraint, Real time programs, Inter process Communication and Synchronization, Multiple processes in an application, Sharing data by multiple tasks, use of finite states machine model & Petri net Model, Process, Tasks, Threads.

UNIT V: Use of Semaphores for a task or for Critical section of code, Mutex & P & V, Priority inversion problems & deadlock situations IPC issues, Use of Semaphore flags or Mutex as resource key, use of message queues, mailboxes, pipes, virtual sockets, RPCs.

UNIT VI: Introduction to RTOS, OS Services, RTOS Services, Schedule management for multiple tasks in Real Time, Handling of interrupt source call, RTOS task scheduling models, Cooperative Round Robin Scheduling using a Circular Queue of ready tasks and

using and Ordered list as per precedence constraints, Cycling scheduling in Time Sharing, Preemptive scheduling, Critical section service by preemptive scheduler, fixed Real Time scheduling, Precedence assignment in Scheduling algorithms. Performance metrics, IEEE Standard POSIX 1003.1B, fifteen-point÷ strategy for Synchronization, Embedded Linux Kernel.

PRACTICALS : Minimum 12 experiments based on above syllabus.

TEXT BOOK:
1. Rajkamal Embedded Systems, Architecture, Programming & Design, TMH.

REFERENCE BOOKS:
1. Real Time Systems, Jane W. S. Liu, Pearson Education
2. Embedded System Design, A Unified Hardware/Software Introduction, Frank Vahid, Tony Givargis, John Wiley & Sons P Ltd

7IT09   PROJECT AND SEMINAR:
          Seminar should be preferably based on the proposed project to be covered in final year. The semester should be conducted in seventh semester and evaluated. Each candidate shall submit a seminar report, deliver the seminar and face the viva-voce. The distribution of internal 50 marks shall be as follows.

1.   Seminar report preparation and submission :-   10 marks
2.   Seminar delivery/ presentation:-   20 marks
3.   Seminar viva-voce:-   10 marks
4.   Attendance in all seminar session:-   10 marks

SEMESTER: EIGHT

8IT01   DIGITAL AND WIRELESS COMMUNICATION

Unit I: Information Theory: Elements of digital communication system, ,Unit of information, Entropy, Rate of information, Joint entropy, Conditional entropy, Mutual information ,Channel Capacity ,Shenonan¢s Thorem, Shenonan and Hartely Theorem, coding efficiency, Shananon-Fano coding Theorem.

Unit II: Error controlling and coding: Methods of controlling error, linear block codes, matrix description of linear block codes, error detection and error correction capabilities of linear block codes, single error correcting Hamming codes, Cyclic codes, syndromes calculation, error detection, Introduction to Convolution codes

Unit III: Spread Spectrum Signals: Model of spread spectrum communication system, direct sequence spread spectrum signals, generation of PN sequences, frequency hopping spread spectrum (slow frequency and high frequency hopping), comparison, basic principles of TDMA, FDMA, CDMA.

Unit IV: Cellular Telephone Concepts: Introduction, mobile telephone service, cellular telephone architecture, frequency reuse, cell splitting, sectoring, segmentation and dualization, cellular system topology, roaming and handoffs.

Unit V :   GSM & CDMA Technologies : Introduction to GSM, GSM Network Architecture, Protocol Architecture, GSM Channels, Frame structure for GSM, Authentication & Security in GSM, Introduction to CDMA, Architecture of CDMA System, IS-95 CDMA Forward & Reverse channel, Soft handoff.

Unit VI: Wireless network technology: IEEE 802.11 WLAN technology, ETSI HIPERLAN Technology, IEEE 802.15 WPAN Technology, IEEE 802.16 WMAN Technology, Mobile Ad hoc Network (MANETs), Mobile IP and Mobility Management, Mobile TCP, Wireless Sensor Networks, RFID Technology, Security Requirements for Wireless Network

TEXT BOOKS:-
1.   K.S.Shanmugam: Digital & Analog Communication Systems, Wiley
2.   T.L.Singal Wireless communications Mc Graw Hill.

REFERENCE BOOKS:-.
1.   R.P. Singh,S.D. Sapre:Communication System Mc Graw Hill.
2.   William Stallings : õWireless Communication and Networksö, Pearson Education Asia .
3.   J.G.Proakis: Digital Communication, Mc Graw Hill.
4.   P. Ramakrishna Rao: Digital Communication, Mc Graw Hill.
5.   Wayne Tomasi : Advanced Electronics Communication Systems, Pearson.
6.   Theodore S. Rappaport, õWireless Communications- Principles and Practice, Pearson.

8IT02   NETWORK ADMINISTRATION AND SECURITY

UNIT I: Introduction to network security, passive and active attacks, authentication, integrity, access control, The model of internetwork 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.

UNIT III: 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 IV: 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.

UNIT V: Network 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.

UNIT VI: System 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.

TEXT BOOKS :
Network Security Essentials - William Stallings (Pearson Edu. Asia)

REFERENCE BOOKS :
1.   Security for Telecommunication and Network management by Moshe Rozenbit (PHI)
2.   Internet Security Protocols - Protecting IP Traffic, by Uyless Black (Pearson Edu. Asia)

8IT03   SOFTWARE ENGINEERING

UNIT I: Evolving role of Software. Software crises & myths. Software engineering. Software process & process models : Linear sequential, prototyping, RAD, Evolutionary Product & Process. Project management concepts : People, Product, Process, Project. WSHH principle, critical practice.

UNIT II: Measures, Metrics & Indicators. Metrics in process & project domains-software measurment, Metrics for software quality, small organization. Software projects Planning : Scope, resources, estimation, decomposition technique, Tools. Software risks : identification, risk projection,refinement & RMMM plan.

UNIT III: Project Scheduling : Concepts. Peoples Efforts. Task set, Task network. Scheduling. EV analysis, Project Plan. Software quality concepts. SQ Assurance, Software reviews, technical reviews, software reliability, ISO 900 L, SQA Plan. SCM process. Version control. SCM standard.

UNIT IV: System engineering : Hierarchy, Business Process & Product engineering : Overviews. Requirement engineering, System

modeling. Requirement analysis. Analysis principles. Software prototyping. Specification. Design Process. Design Principles & Concepts. Effective modular design. Design model & documentation.

UNIT V: Software architecture, Data Design, Architectural styles, Requirement mapping. Transform & Transaction mappings. User-interface design : Golden Rule. UTD, Task analysis & modeling, ID activities, Tools, design evaluation. Component level design : Structure programming, Comparison of design notation.

UNIT VI: Software testing fundamentals ; test case design, Whitebox testing. Basis path, control structure-, Blackbox-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 :
Pressman Roger. S. : Software Engineering, A Practitioner's Approach TMH.

REFERENCE BOOKS :
1.   Somerville : Software Engineering (Addison-Wesley) (5/e)
2.   Fairly R. : Software Engineering (McGraw Hill)
3.   Davis A. : Principles of Software Development (McGraw Hill)
4.   Shooman, M.L. : Software Engineering (McGraw-Hill)

8IT04   PROFESSIONAL ELECTIVE - II
(1) DATA WAREHOUSING AND DATA MINING

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.   (10 hours)

UNIT II: Data mining primitives : Data mining primitives, data mining query language. Concept description : concept description, data generalization, Analytical characterization, mining class comparison.   (8)

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   (8)

UNIT IV: Data ware house and OLAP Technology for data mining : What is data ware house, multidimensional data model, data ware house architecture, data ware house implementation.   (8)

UNIT V: Data Staging : overview, plan effectively, dimension table staging, fact table loads and ware house operations, data quality and cleansing, miscellaneous issues.   (8)

UNIT VI: Building end user applications : role of end user application, application specification, end user application development, maintaining and growing data ware house : manage the exisiting data ware house environment, prepare for growth and evaluation.

(8)

TEXT 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.

REFERENCE BOOKS :
1. Berson : Data Ware Housing, Data Mining and OLAP, Tata McGraw Hill.
2. Arun K. Pujari : Data Mining Techniques, University Press (Orient Longman)

8IT04   PROFESSIONAL ELECTIVE - II
(2) WEB COMMERCE

UNIT-I: Basic web commerce concepts, electronic commerce environments,electronic marketplace technologies , commerce modes:overview, EDI, electronic commerce with www-internet,commerce net advocacy.

UNIT-II: Approach to safe E-commerce: overview , secure transport protocol and transaction, SEPP, SET, certificate for authentication, security on web server and enterprise network.

UNIT-III: Electronic cash and Electronic payment scheme:Internet monetary payment and security requirements; Payment & purchase order process, Online Electronic cash.

UNIT-IV: Internet/Intranet Security issues and solutions: Needs for computer security, security strategies, Encryption. MasterCard/ visa secure Electronic Transaction: Introduction requirements and concepts, payment processing.

UNIT-V: Secure E-mail Technologies:Introduction, means of distribution, models for message handling, How does Email work? MIME, S/ MIME, moss comparisons of security methods, MIME and Related facilities for EDI over the internet

UNIT-VI: Internet & web site Establishment:Internet Resources for commerce: introduction, Web server Technologies, internet tools Relevant to commerce, internet applications for commerce, internet Access and Architecture,Internet searching.

TEXT BOOK :
Daniel Minoli & Emma Minoli : Web Commerce Technology Hand Book

REFERENCE BOOKS :
1. David Whiteley : E Commerce (TMH)
2. Kalakota Whinston ó frontiers of e Commerce (Pearson education)

8IT04   PROFESSIONAL ELECTIVE - II
(3) CLOUD COMPUTING

UNIT I: **Introduction:** Cloud Computing Defined, the SPI Framework for Cloud Computing: Relevant Technologies in Cloud Computing, the Cloud Services Delivery Model, Cloud Deployment Models, Key Drivers to Adopting the Cloud, The Impact of Cloud Computing on Users, Barriers to Cloud Computing Adoption in the Enterprise.

UNIT II: **Infrastructure Security:** The Network Level: Ensuring Data Confidentiality and Integrity, Ensuring Proper Access Control, The Host Level: SaaS and PaaS Host Security, IaaS Host Security, Virtual Server Security, The Application Level: SaaS Application Security, PaaS Application Security, IaaS Application Security, **Data Security and Storage:** Provider Data and Its Security.

UNIT III: **Identity and Access Management:** Need of IAM , IAM challenge and definition, IAM Architecture and Practice, **Security Management in the Cloud:** Security Management in the Cloud, Availability Management, SaaS, PaaS, IaaS Availability Management, Access control.

UNIT IV: **Privacy:** Key Privacy Concerns in the Cloud?, Changes to Privacy Risk Management and Compliance in Relation to Cloud Computing, Legal and Regulatory Implications, International Laws and Regulations.

UNIT V: **Audit and Compliance:** Internal Policy Compliance, Governance, Risk, and Compliance (GRC), Illustrative Control Objectives for Cloud Computing, Incremental CSP-Specific Control Objectives, Additional Key Management Control Objectives, Control Considerations for CSP Users, Regulatory/External Compliance.

UNIT VI: **The Impact of Cloud Computing on the Role of Corporate IT**: Why Cloud Computing Will Be Popular with Business Units, Potential Threats of Using CSPs, A Case Study Illustrating Potential Changes in the IT Profession Caused by Cloud Computing, Governance Factors to Consider When Using Cloud Computing.

TEXT BOOK:
1. Tim Mather, Subra Kumaraswamy, and Shahed Latif, Cloud Security and Privacy, OφReilly.

REFERENCES:
1. George Reese, Cloud Application Architectures, OφReilly.
2. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing

8IT04   PROFESSIONAL ELECTIVE - II
(4) NEURAL NETWORK AND FUZZY LOGIC

UNIT-I: Fundamental of Neural Network: Basic concepts of Neural Network, Human Brain, Model of artificial neurons, Neural Network architecture, Characteristics of Neural Network, Learning methods, Taxonomy of Neural Network architecture, Early Neural Network architecture.   (08 Hrs)

UNIT II: Backpropogation Networks: Architecture of a Back propagation Network, The Perceptron Model, The solution, Single Layer Artificial Neural Network, Model for Multiayer Perceptron, Back propagation learning, Input Layer, Hidden Layer and Output Layer Computation, Calculation of error, Training of Neural Network, Method of Seepest Descent, Effect of Learning rate, Adding a momentum Term, Backpropogation Algorithm.
                                                                      (08Hrs)

UNIT III: Associative Memory:- Autocorrelation, Hetro-correlation, Multiple training encoding strategy, Exponential BAM, Associate memory for Real coded pattern pairs, Character recognition application,   (08 Hrs)

UNIT IV: Adaptive Resonance Theory:- Cluster structure, Vector quantization, classical ART network, simplifier ART architecture, ART1: architecture, special features and algorithm, ART2: architecture, special features and algorithm, character recognition using ART1.   (08 Hrs)

UNIT-V: Fuzzy Set Theory: Fuzzy verses Crisp, Crisp sets, Operations and Properties of Crisp Sets, Partition and Covering, Fuzzy sets, Membership Function, Basic Fuzzy Set Operation, Properties of Fuzzy Sets, Crisp Relations, Cartesian product, other relations, Operations on Relations, Fuzzy Relations, Fuzzy Cartesian Product, Operations on Fuzzy Relations.   (08Hrs)

UNIT VI: Fuzzy Systems: Crisp logic, Laws of Propositional logic, Inference in Propositional logic, Predicate logic, Interpretations of Predicate Logic Formula, Inference in Predicate Logic, Fuzzy logic, Fuzzy Quantifiers and Inference, Fuzzy rule based system, Defuzzification methods, applications.   (08 Hrs)

TEXT BOOK :
S. Rajesekaran, G. A. Vijayalakshmi Pai: õNeural Network, Fuzzy logic, and Genetic algorithms Synthesis and Applicationsö PHI.

REFERENCE BOOKS:
1.   S. Hykin: õNeural Networksö Pearson Education.
2.   Jang,Sun and Mezutani: õ Neuro Fuzzy and Soft Computingö .
3.   Zurada: õArtificial Neural Neworksö.
4.   N.P.Pahey: õArtificial Intelligence and Intelligent Systemsö, Oxford University Press.

8IT05   NETWORK ADMINISTRATION AND SECURITY - LAB:
            Minimum 8 experiments based on the syllabus of 8IT02.

8IT06   SOFTWARE ENGINEERING - LAB:
Minimum 8 experiments based on the syllabus of 8IT03.

8IT07   COMPUTER LAB-V (CONTENT MANAGEMENT SYSTEM):
Practicals based on Content Management Systems:
A list of sample practicals can be as under:
1.   To Study Content Management System.
2.   To Study Different Types of Content Management System.
3.   Installation of Content Management System framework.
4.   Installation of Different Tool on Content Management System framework.
5.   To Study WAMP Server and there installation.
6.   To creating & Configuring Menus in Joomla
7.   To installing & Configuring Templates in Joomla.
8.   To design advance templates & CSS Tricks
9.   To Customise XML Templates in Joomla

8IT08   PROJECT AND SEMINAR:
The project shall be evaluated in three phases based on the progress of the project work.
Phase I: - Problem, Definition and Design
Phase II: - Problem Implementation and Testing
Phase III: - Project demonstration & report submission.
Each phase shall be internally evaluated for 25 marks.
        The external evaluation of the project shall be based on demonstration of the project and viva-voce
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