SYLLABUS PRESCRIBED FOR
TWO YEAR P.G. COURSE IN
MASTER OF ENGINEERING (FULL TIME)
M.E. (COMPUTER SCIENCE & INFORMATION TECHNOLOGY)

1RNME1 ADVANCED COMPUTER ARCHITECTURE

Unit I: Fundamentals: Technology & Computer usage trends, costs, Performance measurements. Quantitative principles of Computer design. Concepts of memory hierarchy. Instruction set architectures. Memory addressing. Operations in the instruction set. Encoding. Role of compilers. DLX architecture.

Unit II: Pipelining: Basic principles & DLX. Various hazards: Pipelines, data, control hazards. Implementation issues. Multicycle operations. Crosscutting issues. Instruction set design and pipelining. MIPS R4000 pipeline architecture.

Unit III: Advanced pipeline and instruction - level parallelism: concepts & challenges. Data hazards & dynamic scheduling. Dynamic Hardware prediction. Compiler support for ILP. Hardware support for parallelism. Studies of ILP. Power PC620.

Unit IV: Memory- hierarchy design : Basics of caches, Reducing cache miss & hit time. Main memory. Virtual memory. Protections Examples of virtual memory. Issues in the design of memory hierarchies. Alpha APX 21064 Memory hierarchy.

Unit V: Storage Systems: Types of storage devices, Buses & their types, performance I/O performance measures. Reliability, Availability and RAID. Interfacing to an Operating system. Designing an I/O system. Unix file system performance.

Unit VI: Interconnection networks: Introduction & basic concepts, Computer connection to interconnection network. Interconnection network media. Practical issues. Examples of interconnection networks. Issues for interconnection networks. Internet working. An ATM network of workstation.

TEXT BOOK:
Hennessy J.L. & Patterson D.A. "Computer Architecture : A Quantitative Approach" 2/e (Harcourt Asia).

REFERENCE BOOKS:
1. Hayes J.P., "Introduction to Computer Architecture", (McGraw Hill)).
2. Tenanbaum A. S., "Computer Organisation and Architecture", (PHI).
3. Hwang K, "Advanced Computer Architecture", (McGraw Hill).
4. Hamacher V.C, "Computer Organization", (McGraw Hill).

Predictive Coding, Transform Based Compression, Image Compression Standard, Scalar Quantization, Vector Quantization.

UNIT VI: Wavelet Based Image Processing: Introduction to Wavelet Transform, Continuous Wavelet Transform, 2D Continuous Wavelet Transform, Multi-resolution analysis, Wavelet based Image Compression, JPEG2000 Compression Standard. Digital Image Watermarking, Classification of watermarking methods, watermarking in spatial domain, watermarking in frequency domain, applications of digital water marking.

TEXT BOOK:
Jayaraman, Esakkairajan, Veerkumar, "Digital Image Processing" , TMH Publication.

REFERENCE BOOKS:
1. R.C. Gonzales & Woods, "Digital Image Processing" Addison Wesley.
2. A.K.Jain "Fundamental Digital Image Processing " Prentice Hall Inc.
3. W.K.Pratt, "Digital Image Processing" John Wiley.
4. B.Chanda and D.Majumdar, "Digital Image Processing and Analysis" PHI.

2EEEME6 SEMINAR

The Seminar shall be based on the recent trends in the field of electrical and electronics engineering preferably related to the subjects 2EEEME1 to 2EEEME5. It should be surveyed from the technical literature published in international / national journals. A report should be prepared following the guidelines of IEEE paper format, submitted and followed by the presentation.

2EEEME7 EMBEDDED SYSTEMS DESIGN LAB

Minimum Eight experiments based on the syllabus of 2EEEME2 Embedded Systems Design using appropriate hardware and software.

SEMESTER-III
3EEEME1 SEMINAR & DISSERTETION
(As per given Scheme)

SEMESTER-IV
4EEEME1 SEMINAR & DISSERTETION
(As per given Scheme)

****

1RNME2 DISTRIBUTED OPERATING SYSTEM DESIGN

Unit I: Introduction : Distributed Computing Models, Software Concepts, Issues in Designing Distributed systems, Client Server Model, Case studies, review of n/w communication, protocols for distributed system.

Unit II: Interprocess communication : Message passing, case study, group communication, case study Remote Communication : Introduction, RPC – Implementation, Communication, Issues, RMIs, Java RMs.

Unit III: Synchronization : Introduction, Clock synchronization, logical clocks, Mutual Exclusion, Election Algorithm, Deadlocks in distributed systems.

Unit IV: Distributed System Management : Introduction, Tash assignment, Load Balancing, Load sharing, Process Management, Process Migration, Threads, Fault tolerance.

Unit V: Distributed Shared Memory : Introduction, Basic Concepts, Design Issues in DSM, Issues in Implementation.

Unit VI: Distributed file management : Introduction, Distributed file system design.
Naming : Introduction, Designing, Human Oriented Names
Security in Distributed Systems : Introduction, Case Studies
Realtime distributed OS : Introduction, Design of RTDOS

TEXT BOOKS :
1) Distributed Systems : "Concepts & Design Coreterous, Dollimore, Kindberge – Addison-Wesley.

REFERENCE BOOKS :
1) Jose Garrido, Schlesiger, Hongson : "Principle of Mdern Operating Systems",
   Pub : Jones & Bartlet Learning ((VIVA Books)
2) Tang : "Security Scrategies in Linux Platforms and applications",
   Pub : Jones & Bartlet Learning ((VIVA)
3) Soloman : "Security Strategies in Windows Platforms and Applications",
   Pub : Jones & Bartlet Learning ((VIVA)
4) Lunch : "Distributed Algorithms", Pub : CBS

1RNME3 DISTRIBUTED DATABASE SYSTEMS

Unit I: **Review of DBMS :** Introduction to Database Processing, ER models, Database Models, Symentic Object Models, Relational Model, Normalization, Database Designs Using ER models, Managing multiusers databases, ODBC, OLE, DB, ADO, Webserver Data Environment, ODBC, JDBC, JSP with reference databases, Relational Data Manipulation with SQL, MySQL & Oracle.

Unit II: **Distributed Databases Management Systems :**
Introduction to DDBMS, Parallel DBMS, DDBMS Architecture, Data storage, Distributed Catalogue Management, Distributed Query Processing, Distributed transactions, Distributed concurrency control, Distributed Databases Recovery, Mobile Databases, Case Study.

Unit III: **Emerging Trends in Distributed Computing :**
Introduction to Grid Computing, SOA, Cloud Computing
Dataware Housing : Need, Benefits, Subject oriented Data, Data granularity, Information flow mechanism.

Unit IV: **Meta Data** : Rele, Classification, Management, DWH architecture, DWH and data marts, DWH Scheme, Keys in DWH schema, OLAP in DWH, OLAP Design considerations, OLAP models, Security Issues.

Unit V: **Data Mining :** Introduction, Fundamentals, Classifications, Major Issues, Mining frequent patterns, association & correlation, clustor analysis, evolution analysis

Unit VI: Market Basket Analysis, Apriori Algorithm, Association Regeneration, constraint based association rules Classification and Prediction, Bay's Theorem, Rule Based classification.

BOOKS RECOMMENDED :
1) C.J. Date : "Database Processing", Addison Wesley
2) Mahajan : " Distributed Computing"
3) M.H. Danham : "Data mining Introductory & Advance topics", PE
4) Han, Kamber : "Data Mining", Morgan Kaufmah
5) Dataware Housing : OUP
6) Dataware Housing : John Wiley

1RNME4   WIRELESS COMMUNICATION & NETWORK COMPUTING

Unit I: Wireless Communication present scenario, fundamentals, Introduction to source coding and channel coding

Unit II: Radio propagation over wireless channels, Brief overview of channel models.

Unit III: Wireless Communication Systems Standards, MAN, WLAN, WMAN, Introduction to mimo, Brief Overview of simulation.

Unit IV: Spread spectrum technology, multiple access wireless communication, GSM.

Unit V: GPRS, imode, UmTS, Wireless data networks, RFID.

Unit VI: Connecting the last mile, wireless Information Security, convergence-3G, Future Trends, 4G.

TEXT BOOKS:
1) Upen Dalal : Wireless Communication, Offord.
2) Vern A D : Wireless Data Technologies, Wiley

REFERENCE BOOKS:
1. Vern A.D."Wireless Data Technologies" : Wiley
2. Ray ES : "Space/Tererestrial Mobile Network Internet access & QOS, : Wiley
3. Rai Zing : "Multihop Wireless Networks, Wiley
4. Yu Kwang, Ricky Klark, Vincnt K.N.Lau : wireless Internet & Mobile Computing Interoperability & Performance" : Wiley

1RNME5   ELECTIVE I
(1) EXPERT SYSTEM DESIGN & INTELLIGENT SYSTEMS

Unit I: Introduction to ES : Overview of AI, Intelligent systems, knowledge representation, principles & techniques evaluating & comparising ES, TMS, Nonmonotonic justification, maintaining multiple contacts.

Unit II: Rule based systems : Canonical systems, production systems, production systems, associate nets & frame systems, OOAD for ES.
University Issues, knowledge acquisition, ES shells, knowledge acquisition methods, tools for building ES.

Unit III: Fuzzy Systems : introduction, foundation of fuzzy systems, fuzzy relations, arithmetic operations of fuzzy numbers, linguistic

descriptions and their analytical forms, defuzzification methods, fuzzy logic in control and decisionmaking applications, hardware realization of the analog fuzzy controller.

Unit IV: Artificial Neural Networks : introduction, Neuron physiology, artificial neurons, artificial neural networks, features of artificial neural networks, backpropagation training algorithms, functional link neural networks, cascasde correlation neural networks.

Unit V: Genetic Algorithms and Evolutionary Programming : introduction, genetic algorithms, procedures of genetic algorithms, the working of genetic algorithms, the logic behind genetic algorithms, evolutionary programming, the working of evolutionary programming, genetic-algorithmbased machine learning classifier system.

Unit VI: Swarm Intelligent Systems : introduction, background of Ant intelligent systems, importance of the ant colony paradigm, ant colony systems, development of the ant colony systems, application of ant colony intelligence, the working of ant colony systems, particle Swarm intelligent systems, engineering applications of PSIS and future research.

TEXT BOOKS:
1) Peter Jackson "Introduction to Expert System" PE 3rd Ed., 2003
2) N.P.Padhy, "Artificial Intelligence and Intelligent Systems", Oxford.

REFERENCE BOOKS :
1) Hakin, Simon 2003, "Neural Networks : A Comprehensive Foundation", PHI, New Delhi.
2) Kosko B. 1997, "Neural Networks and Fuzzy Systems", PHI, New Delhi.
3) Rajasekaran S. and G.A.Vijayalakshmi Pai, 2003, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, New Delhi.
4) Sriram, Ram D. 1977, "Intelligent Systems for Engineering - AKnowledge-Based Approach", Springer, London.

1RNME5   ELECTIVE I
(2) ALGORITHMICS

Unit I: Introduction: Mathematical Notations, Proof techniques, Elementary algorithmics, Efficiency of algorithms : Examples. Asymptomatic notations: conditional asymptomatic

notations. Notation with several parameters. Operations on asymptomatic notations.

Unit II: Algorithm analysis: Analysing control structures. Examples. Average-case analysis. Amortized analysis. Solving recurrences. Review of data structures: Arrays, Stacks, Queries, Records & Pointers, Lists, Graphs, Trees, Associative tables, Heaps.

Unit III: Greedy Algorithms: Some characteristics, Graphs: Minimum spanning trees, Shortest paths. The knapsack problem, Scheduling, Divide & Conques : Introduction - general template, Binary search, sorting, median finding & matrix multiplication. Exponentiation Cryptograph.

Unit IV: Dynamic programming: Examples, Principle of optimality, Knapsack problem & shortest paths. Chained matrix multiplication, Recursion, Memory function. Graphs: Traversing trees. Depth-first-search : Directed & undirected graphs : Breadth-first-search. Back tracking. Branch-and-Bound. Minimax principle.

Unit V: Probability algorithms: Introduction, pseudorandom generation. Numerical probabilistic algorithms. Monte Carlo algorithms. Las Vegas algorithms. Parallel algorithms: Basic techniques. Work & efficiency. Examples. Parallel evaluations of expressions. Parallel sorting networks & parallel sorting.

Unit VI: Computational complexity. Introduction. Information-theoretic arguments. Adversary arguments. Linear reduction, Introduction to NP-completeness. Heuristic algorithms. Approximate algorithms. NP-hard approximation problems. Approximation schemes.

TEXT BOOK:
G. Brassard, P.Bratley, "Fundamentals of Algorithmics", (PHI).

REFERENCE BOOKS:
1. Horowitz & Sahni, "Fundamentals of Algorithms", (Galgotia).
2. Aho, Ullman, "Analysis & Design of Computer Algorithms", (Addison-Wesley).
3. Donald E.Knuth, "The Art of Computer Programming", Vol.I, Vol.II, Vol.III, (Addison-Wesley).

1RNME5   **ELECTIVE I**
    (3) INFORMATION TECHNLOGY MANAGEMENT

Unit-I : IT and Strategy : Information revolution, Business and strategy. IT Strategy, Strategy and Success, Design Parameters, Strategic

positioning, Evolution of strategy sequences and getting the right, development of a strategy ,types of strategy ,context and strategy.

Unit-II : Managing IT :IT management and its roles, It governance, It governance and strategy, Technology management process, Technology selection, Strategic aspects of technology. IT and business alignment, Risk Management ,Exploiting IT Capabilities, Deploying IT in strategic manner ,Strategic planning for information technology and frameworks , Measuring IT, Performance Measures : Balanced Score Card.

Unit-III : E- strategy : What is e- strategy. E-business and E-strategy, E- business objectives ,E-Commerce and E-Business, Making e- strategy work, E-strategy and the E-economy. IT strategies for IT companies: Project Vs Product Companies , Strategies aspects for an IT product company, IT Strategic perspective for product company ,IT Strategies for Product company information Technology Strategy development, Product life cycle and project life cycles.

Unit-IV : IT strategies for Knowledge Management Knowledge Management, Knowledge Management and IT strategies, role of Knowledge Management in IT strategies for IT companies, knowledge industry and knowledge strategy knowledge workers, IT strategic services ,product and consulting . IT strategies for non –IT companies : Role of IT in non –IT companies , IT Investment decision, measurement of IT,IT strategies for Non-IT companies, IT supply chain management and constraint management, IT enabled supply chain management.

Unit-V : IT Strategies in specific scenario, Enterprise resource planning implementation, mapping IT strategies initiatives to ERP ,supply chain contribution and business strategy, IT strategies for business process outsourcing, IT strategy implementation : IT strategy implementation, Development and need of it strategic plan ,IT strategy implementation to gain competitive advantage, IT strategy and leadership, IT strategy and differentiation ,Execution and IT strategy .

Unit-VI : Global dimension of It Strategy : IT strategies in global environment, Global product cycle, Making It global scenario, globalization and competitive strategy, global project management, Mergers and acquisitions ,IT compatibility in M&A.

TEXT BOOK:
Parag Kulkarni,Pradip K Chande "IT Strategy for Business", OXFORD University Press.

REFERENCE BOOKS:
1. Earl. M, "Management Strategies for Information Technology" ,Prentice Hall.
2. Gottschalk, P " Strategic Knowledge Managements Technology " IGPUSA
3. Hill , C and G Jones " Strategic management " Houghton Miffen USA
4. Honeycutt J" Knowledge management Strategies", Microsoft Press USA.

2RNME1   REAL TIME EMBEDDED SYSTEMS

Unit I: Introduction to ES : Application, categories, architecture overview, specialties, Recent Trends. Architecture : Hardware Architecture, Software Architecture

Unit II: Programming of ES : Memory Management, Timing, Device Drivers, Productivity Tools, Code Optimization, Coding guidelines, C++ & Java for ES. ES development process & design, Implementation, Integration, testing, Packaging, Configuration management, projects.

Unit III: Hardware Platforms and Communications : Types of hardware platforms, microcontrollers, communication interfaces, RS232, RS422, US, Infrared, IEEE, Ethernet, Bluetooth.

Unit IV: RTOS & ES : Kernel architecture, Tash scheduler, ISRs, Semaphones, Mutex, Mailboxes, Message Censes, Event Registers, Pipes, Signals, Timers, Memory Management, Priority Inversion, Embedded OS, RTOS, Handheld OS, OS S/ W, Embedded winXP, Perting RTOS on ES Board.

Unit V: Sample ES : Representative OS, Es programming in Linux, Shell programming, system programming, project overview for navigation system, protocol convertor, Database applications, Mobile Java applications.

Unit VI: Embedded S/W development for Microcontroller : Development Environment, Tools, Application development, RFID System, DSP based system, Future Trends.

TEXT BOOK:
1) Embedded / Real Time Systems : "Concept, Design & Programming", Black Book – Prasad Dreamtech Pub.

REFERENCE BOOKS:
1. Null & Labour : Essentials of Computer Architecture & Organization",
Pub : Jones & Bartlet (VIVA Pub.)
2. Heath :"Embedded System Design", Pub : CBS
3. Shaw : Real Time Systems & Softwares" : Pub : CBS
4. Zurawaski : "Embedded Systems Handbook" , Pub : CBS

2RNME2 PERFORMANCE ANALYSIS FOR IMAGING SYSTEMS

Unit I Basic Principles of Imaging, Imerging System, Performance, Imaging System Isues

Unit II Acquisition of Images, Image quality, Signal Processing, Performance evolution

Unit III Signal & Image processing, Image resampling performance issues

Unit IV Super resolution, Image debluzzing, performance analysis

Unit V Image contrast Enhancement, Non uniformity correction, performance issues

Unit VI Time Scale, Image Function, Performance measurement

TEXT BOOK :
"Signal Processing and Performance Analysis of Image Systems" : S. Susan Young, Renald GD, Edlie L.J., Artech House Inc.

REFERENCE BOOKS:
1. Gomes : "Image Processing for Computer Graphics" Pub : CBS
2. Abut : "DSP for in-vehicle and mobile systems" Pub: CBS
3. Adali : " Adaptive Signal Processing : Next Generation Solution" Pub : CBS

2RNME3   INFORMATION TECHNOLOGY & SECURITY

Unit I Introduction, Security, Public key cryptography, Hash function, quantum, cryptography, cryptography protocols.

Unit II PKD, wireless network access, mobile security, Secure software Engineering, ICT Security.

Unit III ICT & forensic, Risk Asessment, IS management, Hacking & cracking, Reconnaissance

Unit IV Scanning tools, sniffers, TCP/IP vulnerability, Password cracking, spooling

Unit V Session Hacking, Hacking N/W devices, Trojan Horses, Dos Attacks, Buffer Overflows.

Unit VI Programming experts, mail vulnerability, Web Application Vulnerability, Windows Vulnerability, Linux Vulnerability, Incident Handling.

TEXT BOOKS:
1) Multidisciplinary Introduction to Information Security Stig FM – CRC Press
2) Computer Seciruty, Concepts, Issues & implementation – Cenage Learning.

REFERENCE BOOKS:
1. Workman, Phelps, Gathegi :"Information Security for Managers" Pub : Jones & Bartlet (VIVA Pub.)
2. Newman: "Computer Security" Pub : Jones & Bartlet (VIVA Pub.)
3. Johnson & Merkov : "Security Policies and Implementation Issues", Pub: Jones & Bartlet (VIVA Pub.)
4. Gibson : "Managing Risks in Information Systems", Pub: Jones & Bartlet (VIVA Pub.)
5. Basworth : "Computer Security Handbook", Pub : Jones & Bartlet (VIVA Pub.)

2RNME4 SOFTWARE ENGINEERING, TESTING & RELIABILITY

Unit I: Software Engineering Reviews : Software Process models, requirements Engineering, Introduction to UML, Meta Model, Extensibility Mechanism, Introduction to OCL, Behivirol Model, Design Engineering, OOD.

Unit II: Software Testing : Introduction to Testing Methodology, Terminology, Methodology, Verification, Validation.

Unit III: Testing Techniques : Dynamic Testing – Black Box & White Box, Static Testing, Validation Activity, Regression Testing.

Unit IV: Test Management & Quality Management : 1st organization, Test Planning, Software Metrics, Software Quality, Quality Management, Quality factors, Test process maturity models. Testing Tools, OOT Basics, Testing of Web Based systems, Debugging.

Unit V: Reliability Engineering : Introduction, Reliability maths, Life data analysis and Problem plotting, Monte Carlo in simulation.

Unit VI: Software Reliability : Introduction, Load strength Inferences, Reliability Prediction and modeling, software reliability model, patterns.

BOOKS RECOMENDED:
1) Sommerville : "Software Engineering" , 7th Ed., Addison-Wesley 2004
2) Grandy Booch, Ram Bough, Jacobson, "Onified modeling language users guide" , 2nd Ed., Addison-Wesley
3) Marsh Chauhan : Software Testing, Principle & Practice", Publishing.
4) Pratric DT " Practical Reliability Engineering" Wiley

REFERENCE BOOK:
1. Richardson & Thies :"Secure Software Design, Pub : Jones & Bartlet (VIVA Pub.)

2RNME5 ELECTIVE II
(1) ADVANCED COMPILING TECHNIQUES

Unit I: Symbol-Table Structure: Storage Classes, Visibility, and Lifetimes, Symbol Attributes and Symbol-Table Entries, Local Symbol-Table Management, Global Symbol-Table Structure, Storage Binding and Symbolic Registers, Approaches to Generating Loads and Stores.

Unit II: Intermediate Representations: Issues in Designing an Intermediate Language, High-Level, Medium-Level and Low-Level Intermediate Languages, Multi-Level Intermediate Languages, Sample Intermediate Languages: MIR, HIR, and LIR, Representing MIR, HIR and LIR. ICAN Naming of Data Structures, Routines to Manipulate Intermediate Code.

Unit III: Run-Time Support Data Representations and Instructions, Register Usage, The Local Stack Frame, The Run-Time Stack, Parameter-Passing Disciplines, Procedure Prologues, Epilogues, Calls, and Returns, Code Sharing and Position-Independent Code, Symbolic and Polymorphic Language Support.

Unit IV: Producing Code Generators Automatically: Introduction, need and applications to Automatic production of Code Generators, a Syntax- Directed Technique. Introduction to Semantics-Directed Parsing, Tree Pattern Matching and Dynamic Programming.

Unit V: Control-Flow Analysis: Various Approaches, Depth-First Search, Preorder Traversal, Post order Traversal, Breadth-Firs Search, Dominators and Post dominators, Loops, Strongly Connected Components, Reducibility, Interval Analysis, Control Trees, Structural Analysis.

Unit VI: Data-Flow Analysis: Basic Concepts, Taxonomy of Data-Flow Problems, Solution Methods: Iterative, Lattices of Flow Functions and Control-Tree-Eased. Structural Analysis, Interval Analysis,

Du- Chains, Ud-Chains, Webs, SSA Form. Dealing with Arrays, Structures, and Pointers. Automating Construction of Data-Flow Analyzers.

TEXT BOOK:

Steven S. Muchnick, "Advanced Compiler Design Implementation" (Hartcourt Asia- Morgan Kaufman).

REFERENCE BOOKS:

1. Aho, Sethi, Ullman, "Compilers: Principles Techniques and Tools" (Pearson).
2. D. M. Dhamdhere, "Compiler Construction" (2/e), Macmillan.
3. Cooper & Torczon, "Engineering a Compiler" Elsevier.
4. K C. Louden, "Compiler Construction: Principles and Practice" Cengage.

2RNME5   ELECTIVE II
(2) MOBILE COMPUTING

Unit I: Characteristics, Fundamentals and Infrastructure of cellular system, Satellite system, Network protocol, Ad Hoc and sensor network, Wireless MAN's, LAN's and PAN's. Mobile Ratio Propagation: Types of Radio waves, Propagation mechanism, Free space propagation, Land propagation, Path loss, Slow fading, Fast fading, Doppler effect, Delay spread, Coherence Bandwidth ,Inter symbol and Co-channel Interferences.

Unit II: Cellular Concept: Cell area, Signal strength and cell parameter, Capacity of a cell, Frequency reuse, Cluster, Co-channel Interference, Cell Splitting, Cell sectoring. Channel allocation: Static allocation verses Dynamic allocation, fixed channel allocation (FCA) Dynamic channel allocation, Hybrid channel allocation (HCA), Allocation in specialized system structure, System Modeling.

Unit III: Mobile communication systems: Cellular system infrastructure, Registration, Handoff parameter and underlying support Roaming support, Multicasting, Security and privacy, Firewall and system security. Exiting wireless system: AMPS, IS-41, GSM, IMT-2000.

Unit IV: Ad hoc And sensor network: Characteristic of MANET, Applications, Routing, Table – driven routing protocol, Source initiated On- demand Routing, Hybrid protocol, Wireless sensor network, Fixed wireless sensor networks.

Unit V: Wireless MANs, LANs and PAN's: Wireless metropolitan area networks (WMANs), Wireless Local Area networks (WLANs),

and Wireless Personal Area networks (WPANs), Recent Advances, Introduction, and Ultra –wideband technology.

Unit VI: Multimedia services requirement, Push –to-talk (PTT) technology, Mobility and resources management for Integrated system, Multicast in Wireless networks, Directional and smart antennas, Design issue in sensor networks, Bluetooth network, Low - power design, XML, Threat and security issue..

TEXT BOOK:

Agrawal D P and Zeng Q A , "Introduction to Wireless and Mobile Systems", (CENGAGE) (2/e).

REFERENCE BOOKS:

1. Jochen Schiller, "Mobile Communication", (Pearson Education) Second Edition.
2. C.K. Toh, "Ad Hoc Mobile Wireless Networks: Protocols & Systems", (Pearson Edu.)
3. Rajkamal, "Mobile Computing" (Oxford University Press).
4. George A , "Mobile Ad Hoc Networks: From Wireless LANs to 4G Networks" (TMH).

2RNME5   ELECTIVE - II
(3) DIGITAL MEDIA DEVELOPMENT

Unit I : Introduction to Multimedia Systems design, Elements,Systems archiitechture & technologies , Objects for multimedia systems , Multimedia data interface standards, Multimedia Databases, Data Compression need, lossy and lossless compression, binary image compression Schemes, color, grey and still video image compression , Full motion video compression , audio compression.

Unit II : Data and file format standards RTF, TIFF,RIFF, MIDI , JPEG ,AVI, MPEG Standards, video and image display systems, image scanners, Digital voice and audio, Digital camera, video images and animation, Full motion video

Unit III: Telecommunications considerations for Multimedia, Specialised processors, ISDN, LAN and WAN for Enterprise Multimedia Applications, Distributed Object Model, Multimedia communication protocols (UDP , RTP , RTCP , TELNET) Multimedia Applications and Design issues,, Virtual Reality Design,Componects of Multimedia Systems,, Application Workflow & Distributed Application Design Issues

Unit IV : Multimedia Authoring and User Interface, Design Considerations, Hypermedia Applications, Information Access,

Object display, Hypermedia Messaging, Integrated document management

Unit V : Distributed Multimedia Systems, Components, Client-server Operation, Object Server, Network Performance Issues, Distributed Multimedia databases, Managing distributed Objects

Unit VI : System Design: Design issues,requirements, feasibility, Performance Analysis, Design for performance , Multimedia Systems Design , Extensibility and example.

BOOKS RECOMMENDED:

1. Prabhat K Andleigh and Kiran Thakrar "Multimedia Systems Design" (PHI Publications).

2. Fred Halsall," Multimedia Communications by (Pearson Publications).

3. Ze-Nian Li, Mark S.Drew ,"Fundamentals of Multimedia" (Pearson Publications).

4. John K.Koegel Buford, "Multimedia Systems" (Pearson Education)

REFERENCE BOOKS:

1. Game Engineering Design & Implementation - Alan Thorn, Pub : Jones & Bartlet (VIVA Pub.)

2. Fundamentals of Game Development : Chandler & Chandler, Pub : Jones & Bartlet (VIVA Pub.)

2RNME 6 CSIT LAB - III: This lab shall be based on 2RNME1 - Real Time Embedded System

AND **2RNME2** - Performance Analysis for Imaging Systems

2 RNME 7 CSIT LAB - IV : This lab shall be based on 2RNME 3-Informn.Tech.& Security

AND **2RNME4** - Software Engineering, Testing & Reliability

AND/OR **2 RNME5 (E-2)** Mobile Computing (if offered)