## SCHEME OF INSTRUCTION & EXAMINATION

## B.E. IV - YEAR
## (COMPUTER SCIENCE & ENGINEERING)

### SEMESTER - I

| Sl. No. | Syllabus Ref. No. | SUBJECT | Scheme of Instruction | | Scheme of Examination | | |
|---|---|---|---|---|---|---|---|
| | | | Periods per week | | Duration In Hours | Maximum Marks | |
| | | | L | D/P | | Univ. Exam | Sessionals |
| | | **THEORY** | | | | | |
| 1 | CS 401 | Distributed Systems | 4 | - | 3 | 75 | 25 |
| 2 | CS 402 | Artificial Intelligence | 4 | - | 3 | 75 | 25 |
| 3 | CS 403 | Information Security | 4 | - | 3 | 75 | 25 |
| 4 | CS 404 | Principles & Applications of Embedded Systems | 4 | - | 3 | 75 | 25 |
| 5 | | ELECTIVE-I | 4 | - | 3 | 75 | 25 |
| | | **PRACTICALS** | | | | | |
| 1 | CS 431 | Distributed Systems Lab. | - | 3 | 3 | 50 | 25 |
| 2 | CS 432 | Embedded Systems Lab. | - | 3 | 3 | 50 | 25 |
| 3 | CS 433 | Project Seminar | - | 3 | 3 | - | 25 |
| | | **Total** | **20** | **9** | — | **475** | **200** |

**ELECTIVE-I**

CS 411 Software Project Management
CS 412 Computer Graphics
CS 413 Image Processing
CS 414 Adhoc and Sensor Networks
CS 415 Soft Computing
CS 416 Mobile Computing
CS 417 Real Time Systems





**CS 401**

## DISTRIBUTED SYSTEMS

| | |
|---|---|
| Instruction | 4 Periods per week |
| Duration of University Examination | 3 Hours |
| University Examination | 75 Marks |
| Sessional | 25 Marks |

**UNIT-I**

**Characterization of Distributed Systems**

Introduction, Examples of distributed systems, Resource sharing and the web, Challenges.

**System Models**

Introduction, Architectural models, Fundamental models.

**Operating System Support**

The operating system layer, Protection, Processes and threads, Communication and invocation, Operating system architecture.

**UNIT-II**

**Interprocess communication:** Introduction, The API for the internet protocols, External data representation and marshalling.

**Client Server communication:** Group Communication, Case study: Interprocess communication in UNIX.

**Distributed objects and Remote Invocation**: Introduction, Communication between distributed objects, Remote procedure call, Events and notifications, Case study: Java RMI.

**Name Services** : Introduction, Name services and the Domain Name System, Directory services, Case study of the X.500 Directory Service.

**UNIT-III**

**Time and Global States**

Introduction, Clocks , Events and process states, Synchronizing physical clocks, Logical clocks, Global states, Distributed debugging.

**Coordination and Agreement**

Introduction, distributed mutual exclusion, Election, Multicast communication, Consensus and related problems.



M.J.C.E.T

**UNIT-IV**

**Transactions and Concurrency Control**

Introduction, Transactions, Nested transactions, Locks, Optimistic concurrency control..

Timestamp ordering, Comparison of methods for concurrency control.

**Distributed Transactions**

Introduction, Flat and nested distributed transactions, Atomic commit process, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery.

**Replication**

Introduction, System model and group communication, Fault-tolerant services.

Case study: The gossip architecture, CODA.

**UNIT V**

**Distributed Shared Memory**

Introduction, Design and implementation issues, Sequential consistency and IVY case

study. Release consistency and Munin case study, Other consistency model.

**Distributed File Systems**

Introduction, File service architecture, Case study: Sun Network File System.

Enhancements and further developments.

***Suggesting Reading:***


1. Colouris, Dollimore, Kindberg, *" Distributed Systems concepts and Design"* 5th Ed. Pearson Education, 2011.
2. Andrew S. Tanenbaum, Van Steen, *" Distributed Systems "*, Pearson Education, 2010.
3. Singhal M, Shivratari N.G, *"Advanced Concepts Introduction, Operating Systems"* McGraw Hill, 2001.
4. Pradeep K Sinha, *"Distributed Opearating Systems: Concepts and Design"*, Pearson Education, Asia India, 2007.






**CS 402**

## ARTIFICIAL INTELLIGENCE

| | |
|---|---|
| Instruction | 4 Periods per week |
| Duration of University Examination | 3 Hours |
| University Examination | 75 Marks |
| Sessional | 25 Marks |

**UNIT-I**

**Introduction**: Definition, history and applications of AI. Search in State Spaces: Agents that plan, Uninformed search, Algorithm A*, Heuristic Functions and Search Efficiency, Alternative Search Formulations and Applications, Adversarial Search.

**UNIT-II**

**Knowledge Representation and Reasoning**: The Propositional Calculus, Resolution in Propositional Calculus, The Predicate Calculus, Resolution in Predicate Calculus, Rule-Based Expert Systems, Representing Common Sense Knowledge.

**UNIT-III**

**Reasoning with Uncertain Information**: Review of probability theory, Probabilistic Inference, Bayes Networks.

Planning Methods Based on Logic: The Situation Calculus, Planning.

**UNIT-IV**

**Learning from Observations**: Learning decision-trees using Information theory, Learning General Logical Descriptions.

**Neural Networks**: Perceptron, Multilayer feed-forward neural network. Rule Learning.

**UNIT-V**

**Natural Language Processing**: Communication among agents

**Fuzzy Logic Systems**: Crisp Sets, Fuzzy Sets, Some fuzzy terminology, Fuzzy Logic Control, Sugeno Style of Fuzzy inference processing, Fuzzy hedges, $\alpha$ Cut Threshold, Neuro Fuzzy systems.



M.J.C.E.T

***Suggested Reading:***


1. Nils J. Nilsson (1998) *Artificial Intelligence: A New Synthesis,* Elsevier
2. Stuart Russell, Peter Norvig (1995), *Artificial Intelligence – A Modern Approach,* Pearson Edition/PHI.
3. Elaine Rich, Kevin Knight, Shivashankar B Nair (2009), *Artificial Intelligence,* Third edition, Tata McGraw Hill.
4. George F Luger (2009), *Artificial Intelligence, Structures and strategies for Complex Problem solving,* Pearson Edition.






**CS 403**

## INFORMATION SECURITY

| | |
|---|---|
| Instruction | 4 Periods per week |
| Duration of University Examination | 3 Hours |
| University Examination | 75 Marks |
| Sessional | 25 Marks |

**UNIT-I**

**Introduction**: History, critical characteristics of information, NSTISSC security model, Components of an information system, Securing the components, balancing security and access, The SDLC, The security SDLC.

**Need for Security**: Business needs, Threats, Attacks-secure software development

**UNIT-II**

**Legal, Ethical and Professional Issues**: Law and ethics in information security, relevant U.S laws-international laws and legal bodies, Ethics and information security.

**Risk Management**: Overview, Risk Identification, risk assessment, Risk Control strategies, selecting a risk control strategy, Quantitative versus qualitative risk control practices, Risk management discussion points, recommended risk control practices.

**UNIT-III**

**Planning for Security**: Security policy, Standards and practices, Security blue print, Security education, Continuity strategies.

**Security Technology**: Firewalls and VPNs: Physical design, firewalls, protecting remote connections.

**UNIT-IV**

**Security Technology**: Intrusion detection, Access control and other security tools: Intrusion detection and prevention systems, Scanning and analysis tools, Access control devices.

**Cryptography**: Foundations of cryptology, cipher methods, Crypryptographic Algorithms, Cryptographic tools, Protocols for secure communications, Attacks on cryptosystems.

M.J.C.E.T

**UNIT-V**

**Implementing Information Security**: information security project management, technical topics of implementation , Non- technical aspects of implementation, Security certification and accreditation

**Security and Personnel**: Positioning and staffing security function, Employment policies and practices, internal control strategies.

**Information security Maintenance**: Security management models. The maintenance model, Digital forensics

***Suggesting Reading:***


1. Michael E. Whitman and Hebert J Mattord, *Principles of Information Security,* 4th edition, Ed. Cengage Learning 2011
2. Thomas R Peltier, Justing Peltier, John Blackley, *Information Security. Fundamentals,* Auerbacj Publications 2010
3. Detmar W Straub, Seymor Goodman, Richard L Baskerville, *Information Security. Policy proceses and practices,* PHI 2008
4. Marks Merkow and Jim Breithaupt, *Information Security. Principle and Practices,* Pearson Education, 2007.






**CS 404**

## PRINCIPLES AND APPLICATIONS OF EMBEDDED SYSTEMS

| | |
|---|---|
| Instruction | 4 Periods per week |
| Duration of University Examination | 3 Hours |
| University Examination | 75 Marks |
| Sessional | 25 Marks |

**UNIT-I**

**Embedded Computing:** Introduction, Complex Systems and Microprocessor, Embedded System Design Process, Formalisms for System Design, Design Examples.

**Instruction Sets:** Preliminaries, ARM Processor.

**UNIT-II**

**CPUs:** Programming Input and Output, Supervisor Mode, Exceptions and Traps, Co-Processors, Memory System Mechanisms, CPU Performance, CPU Power Consumption.

**Computing Platforms:** Basic Computing Platforms, The CPU Bus, Memory Devices & Systems, Consumer Electronics Architecture, Platform-level Performance Analysis, Design Example.

**UNIT-III**

**Introduction to Real- Time Operating Systems:** Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment.

**Basic Design Using a Real-Time Operating System:** Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like µC-OS (Open Source).

**UNIT-IV**

Multirate Systems, Priority Based Scheduling, Evaluating Operating System Performance.



M.J.C.E.T

**Networks and Multiprocessors:** Networks and Multiprocessors, Categories of Multiprocessors, Distributed Embedded Systems, MPSoCs and Shared memory Multiprocessors, Design Example.

**UNIT-V**

**Embedded Software Development Tools:** Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System;

**Debugging Techniques:** Testing on Host Machine, Using Laboratory Tools, An Example System.

***Suggested Reading:***


1. Marilyn Wolf, *Computers as Components: Principles of Embedded Computing System Design* 3rd Edition, Elsevier, 2012.
2. David E. Simon, *An Embedded Software Primer,* 1999.
3. Raj Kamal, *Embedded Systems,* Tata McGraw Hill, 2008.






**CS 411**

## SOFTWARE PROJECT MANAGEMENT

(Elective-I)

| | |
|---|---|
| Instruction | 4 Periods per week |
| Duration of University Examination | 3 Hours |
| University Examination | 75 Marks |
| Sessional | 25 Marks |

**UNIT-I**

Conventional Software Management, Evolution of software Economics, Improving Software Economics, Old way and New.

**UNIT – II**

Life cycle Phases, Artifacts of Process, Model based software Architectures, Workflows of the process, Check points of the process.

**UNIT-III**

Iterative process Planning, Project organization and responsibilities, Process automation, Project control of process instrumentation, Tailoring the process

**UNIT-IV**

Modern Project profiles, Next generation software Economics, Modern process transitions, Managing Contracts, Managing People and Organizing Teams.

**UNIT-V**

Process Improvement and Managing to the CMM, ISO 12207 – an Overview, Program Management.

***Suggested Reading:***


1. Walker Royce, *Software Project Management: A Unified Framework,* Pearson Education – 1998.
2. Bob Hughes and Mike Cotterell, *Software Project Management,* 4th Edition – Tata McGraw Hill – 2006.
3. Watt S. Humphery, *Managing Software Process,* Addision Weslley 1998.




M.J.C.E.T

**CS 412**

## COMPUTER GRAPHICS

(Elective - I)

| | |
|---|---|
| Instruction | 4 Periods per week |
| Duration of University Examination | 3 Hours |
| University Examination | 75 Marks |
| Sessional | 25 Marks |

**UNIT-I**

**Graphics Systems and Models**: Graphics system; Images; Physical and synthetic; Imaging system; synthetic camera model; programming interface ; graphics architectures programmable pipelines; performance characteristics. Graphics Programming: Programming two-dimensional applications; OpenGL API; Primitives and attributes; color; viewing, control functions

**UNIT-II**

**Input and Interaction**: Input device; clients and servers; displays lists; display lists and modeling; programming event driven input; picking ; building interactive models; animating Interactive programs; logic operations. Geometrics Objects: Three - dimensional primitives; coordinates systems and frames; frames in OpenGL; Modeling colored cube.

**UNIT-III**

**Transformations**: Affine Transformations; Transformations in homogenous coordinates; concatenation of Transformations; OpenGL transformation matrices; Viewing: Classical and Computer views; Viewing with a computer; Positioning of camera; Simple projections; Projections in OpenGL; Hidden surface removal; Parallel-projection matrices; Perspective projection matrices

**UNIT-IV**

**Lighting and Shading**: Light sources; The Phong lighting model; Computational vectors; Polygonal shading; Light sources in OpenGL; Specification of matrices in OpenGL; Global illumination; From Vertices To Frames: Basic implementation strategies; line-segment clipping; polygon clipping; clipping of other primitives; clipping in three dimensions;



Rasterization ; Bresenham's algorithm; Polygon Rasterization ; Hidden surface removal; anti-aliasing; display considerations,

**UNIT-V**

**Modelling & Hierarchy**: Hierarchal models; trees and traversal; use of tree data structure; animation; Graphical objects; Scene graphs; Simple scene graph API; Open Scene graph; other tree structures; Curves and Surfaces: Representation of curves and surfaces; design criteria; Bezier curves and surfaces; Cubic B-splines; General B-splines; rendering curves and surfaces; curves and surfaces in OpenGL

***Suggested Reading:***


1. Edward Angel, *Interactive Computer Graphics A Top-Down Approach Using Open GL*, Peasrson Education, 5th edition, 2009.
2. Fransis S Hill Jr., Stephen M Kelley , *Computer Graphics Using Open GL*, Prentice, Hall, Inc., 3rd edition, 2007.
3. Jim X. Chen, *Foundation of 3D Graphics Programming Using JOGL and Java3D*, SpringerVerlag, 2006.
4. Hearn Donald, Pauline Baker M, *Computer Graphics*, 2nd edition, 1995.
5. Hearn Donald, Pauline Baker M, *Computer Graphics wih OpenGL*, 4th edition , Prentice Hall PTR, 2010.




M.J.C.E.T.

**CS 413**

## IMAGE PROCESSING

(Elective - I)

| | |
|---|---|
| Instruction | 4 Periods per week |
| Duration of University Examination | 3 Hours |
| University Examination | 75 Marks |
| Sessional | 25 Marks |

**UNIT-I**

**Introduction to Digital Image Processing**: Origins and Applications of Digital Image Processing. Fundamental Steps in Digital Image Processing, Components of Digital Image Processing System. Elements of Visual Perception, Light and the Electromagnetic Spectrum, Image Sensing and Acquisition, Image Sampling and Quantization

**UNIT-II**

**Filtering in the Frequency Domain**: Preliminary Concepts, Sampling and the Fourier Transform of Sampled Functions, The Discrete Fourier Transform (DFT) of One Variable, Extension to Function of Two Variables, Image Smoothing and Sharpening using Frequency Domain Filters.

**UNIT-III**

**Filtering Intensity Transformations and Spatial**: Histogram Processing, Fundamental of Spatial Filtering, Smoothing and Sharpening Spatial Filters

**Image Segmentation**: Point, Line and Edge Detection, Thresholding-(Foundation , Basic global thresholding, Otsus method) , Region-Based Segmentation.

**UNIT-IV**

**Image Compression**: Fidelity Criteria, Image Compression Models, Image Formats, Containers and Compression Standards

**Compression Methods**: Huffman Coding, Golomb Coding, Arithmetic Coding, LZW Coding, Run-Length Coding.

**UNIT-V**

**Restoration**: Noise Models, Inverse filtering. Least squares Filtering.
**Color Image Processing** : Color fundamentals, Color models, Pseudocolor Image Processing, Basics of full color image processing.



***Suggested Reading:***


1. Gonzalez R.C., Woods R.E: *Digital Image Processing,* Pearson Education, Third Edition 2012.
2. William K. Pratt, *"Digital Image Processing"*, John Wiley & Sons Inc. 3rd Edition, 2001.
3. McAndrew, *Introduction to Digital Image Processing* , Cengage Learning, 2004.
4. Sonka, Hlavac, Boyle, *Digital Image Processing and Computer Vision,* Cengage learning, 2008.
5. Rosenfeld A. Kak AC: *Digital Picture Processing Vol.I & II Acad,* Press, 2nd Edition, 1982.


M.J.C.E.T

**CS 414**

## ADHOC AND SENSOR NETWORKS

(Elective-I)

| | |
|---|---|
| Instruction | 4 Periods per week |
| Duration of University Examination | 3 Hours |
| University Examination | 75 Marks |
| Sessional | 25 Marks |

**UNIT-I**

Introduction
Routing in Ad Hoc Networks
Broadcasting, Multicasting and Geocasting

**UNIT-II**

Wireless LANs
Wireless PANs
Wireless Mesh Networks

**UNIT-III**

Cognitive Radio and Networks
TCP over Ad Hoc Networks
Applications of Sensor Networks

**UNIT-IV**

Sensor Networks Design Considerations
Sensor Networks in Controlled Environment and Actuators

**UNIT-V**

Security in Ad Hoc and Sensor Networks
Integrating MANETs, WLANs and Cellular Networks

***Suggested Reading :***

1. Carlos de Morais Cordeiro and Dharma Prakash Agrawal, *"Ad Hoc and Sensor Networks : Theory and Applications"*, Second Edition, World Scientific Publishers, 2011.
2. Prasant Mohapatra and Sriramamurtyhy, *"Ad Hoc Networks: Technologies and Protocols"*, Springer International Edition, 2009
3. Kazem Sohraby, Daniel Minoli, Taieb Znati, *"Wireless Sensor Networks'*, A John Wiley & Sons Inc. Publication, 2007.





**CS 415**

## SOFT COMPUTING

(Elective-I)

| | |
|---|---|
| Instruction | 4 Periods per week |
| Duration of University Examination | 3 Hours |
| University Examination | 75 Marks |
| Sessional | 25 Marks |

**UNIT-I**

**Introduction**: Neural networks, application scope of neural networks, fuzzy logic, genetic algorithm, hybrid systems, Soft computing. Artificial neural networks: Fundamental concepts, Evolution of neural networks, basic model of Artificial neural networks, Important terminology of ANNs, McCulloch-pitts neuron model, Linear separability, Hebb Network Supervised Learning Network: Perceptron networks, adaptive linear neuron (Adaline), Multiple adaptive linear neuron, Back propagation network, Radial basis Function network (Architecture& Training algorithms)

**UNIT-II**

**Associative Memory Networks**: Training algorithm for pattern Association, Associative memory network, Hetroassociative memory network (Architecture& Training algorithm), Bidirectional associative memory network Architecture, Discrete Bidirectional associative memory network, Continuous BAM, Analysis of hamming distance, Energy function and storage capacity, Hopfield networks discrete &continuous. Unsupervised Learning Networks: Fixed weight competitive Nets, Kohonen self organizing network, Learning vector quantization (Architecture& Training algorithm) Adaptive Resonance theory network. Special networks: Simulated Annealing Networks,Boltzmann machine, Gaussian machine

**UNIT-III**

**Fuzzy Logic**: Introduction to Classical sets and fuzzy sets, Classical sets,Fuzzy sets: Operations and Properties. Fuzzy Relations: Cardinality, Operations and Properties, Equivalence & tolerance. Membership function: Fuzzification, membership value assignment: Inference, rank ordering, angular fuzzy sets



M.J.C.E.T

**UNIT-IV**

**Defuzzification**: Lamda Cuts for fuzzy sets and relations, defuzzification methods Fuzzy arithmetic and fuzzy measures: Fuzzy arithmetic, extension principle, fuzzy measures, measures of fuzziness, fuzzy integral Fuzzy rule base and approximate reasoning: truth values and tables in fuzzy logic, fuzzy propositions formation of rules
,decomposition of compound rules, aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference system, fuzzy expert systems

**UNIT-V**

**Fuzzy decision making**: Individual, multiperson, multi objective, multi attribute, Fuzzy Bayesian decision making, Fuzzy logic control system: control system design, architecture &operation of FLCsystem,FLC system models,Aplication of FLC system.

**Genetic Algorithim**: Introduction,basic operators& terminology, Traditional algorithm vs genetic algorithm, simple GA, general genetic algorithm, schema theorem, Classification of genetic algorithm, Holland classifier systems, genetic programming , applications of genetic algorithm

***Suggested Reading:***


1. S. N. Sivanandam & S.N.Deepa, *"Principles of Soft Computing"*, Wiley India, 2008.
2. Limin Fu, *"Neural Networks in Computer Intelligence"*, McGraw Hill, 1995.
3. Timoty J. Ross, *"Fuzzy Logic with Engineering Applications"*, McGraw Hill, 1997.






**CS 416**

## MOBILE COMPUTING

(Elective-I)

| | |
|---|---|
| Instruction | 4 Periods per week |
| Duration of University Examination | 3 Hours |
| University Examination | 75 Marks |
| Sessional | 25 Marks |

**UNIT-I**

**Introduction and applications of mobile computing**, Wireless transmission: Frequencies, Signals, Antennas, Signal Propagation, Multiplexing, Modulation , Spread Spectrum, Cellular systems.

Medium access control, SDMA, FDMA, TDMA, CDMA, Comparisons.

**UNIT-II**

**Telecommunication system**, GSM, DECT, TETRA, Satellite systems: Applications, Basics, routing, localization, Handover. Broadcast systems: cyclic representation of data, Digital Audio Broadcasting, Digital video broadcasting, convergence of Broadcasting and Mobile Communications.

**UNIT-III**

**Wireless LAN**: Infrared Vs Radio transmission, Infrastructure and Adhoc Networks, HYPERLAN, Bluetooth.

**UNIT-IV**

Mobile IP, Dynamic Host Configuration Protocol, Mobile Adhoc Networks, Mobile Transport Layer, Traditional TCP Classical TCP improvements, TCP over 2.5/3G Wireless Networks, Performance Enhancing Proxies.

**UNIT-V**

**Operating Systems for Mobile Devices**: Features of Windows CE, PalmOS, Symbian OS, and Java Card Support for Mobility: Pile systems, WWW, Wireless Application Protocol.

***Suggested Reading:***


1. Schiller, *Mobile Communications, 2nd* Edition Pearson Education, India, 2003.
2. Hansmann, Merk, Nicklous, Stober, *Principles of Mobile Computing.* 2nd Edition, Springer International Edition, 2003.
3. Frank Adelstein, Sandeep K.S. Gupta *"Fundamentals of Mobile and Pervasive Computing"*,Tata McGraw-Hill 2005.




M.J.C.E.T

**CS 417**

## REAL TIME SYSTEMS

(Elective-I)

| | |
|---|---|
| Instruction | 4 Periods per week |
| Duration of University Examination | 3 Hours |
| University Examination | 75 Marks |
| Sessional | 25 Marks |

**UNIT-I**

**Introduction** : Definition, Applications and Types of Real Time Systems, Typical Case Studies of Real Time Systems, Timing Constraints.

A Reference Model for Real Time Systems: Processors and Resources, Periodic Task Model, Precedence and Data Dependency, Temporal, Functional and Resource parameters, Scheduling Hierarchy.

**UNIT-II**

Real Time Scheduling: Different Approaches- Clock Driven, Priority Driven, Scheduling of Periodic, Aperiodic and Sporadic Jobs in Priority Driven Systems.

**UNIT-III**

**Resource Management:** Resources and Resource Access Control, Critical Section, Priority: Ceiling Protocols, Concurrent Access to Data Objects.

**UNIT-IV**

**Implementation Aspects:** Timing Services and Scheduling Mechanisms, Other Basic Operating System Functions, Processor Reserves and Resource Kernel, Open System Architecture, Capabilities of Commercial Real Time Operating Systems, Predictability of General Purpose Operating Systems.

**UNIT-V**

**Case Studies:** Vx – Works, RT Linux.



***Suggested Reading:***


1. Jane W.S. Liu *"Real Time System"*, Pearson Education Asia,2001.
2. C.M. Krishna and Kang 0. Shin, *"Real Time Systems"*, McGraw Hill Companies Inc., 1997.
3. Raymond J.A. Buhr, Donald L. Bailey, *"An Introduction to Real Time Systems"*, Prentice Hall International, 1999.
4. K.V.K.K Prasad, *"Embedded Real Time Systems, Concepts, Design and Programming"*, Dream Tech, 2003.


M.J.C.E.T

**CS 431**

## DISTRIBUTED SYSTEMS LAB

| | |
|---|---|
| Instruction | 3 Periods per week |
| Duration of University Examination | 3 Hours |
| University Examination | 50 Marks |
| Sessional | 25 Marks |

1. Develop an FTP Client. Provide a GUI interface for the access of all the services.
2. Implement a mini DNS protocol using RPC.
3. Implement a chat server and RMI using JAVA.
4. Implement a 2PC for distributed transaction management.
5. Study of NFS.
6. Case Study on Database Replication





**CS 432**

## EMBEDDED SYSTEMS LAB

| | |
|---|---|
| Instruction | 3 Periods per week |
| Duration of University Examination | 3 Hours |
| University Examination | 50 Marks |
| Sessional | 25 Marks |

1.Use of 8-bit and 32-bit Microcontrollers (such as 8051 Microcontroller, ARM2148 / ARM2378, LPC 2141/42/44/46/48), Microcontroller and C –compiler (Keil, Ride etc.) to:

I. Interface Input – Output and other units such as:
Relays, LEDs, LCDs, Switches, keypads, Stepper Motors, Sensors, ADCs, Timers.

II. Demonstrate Communications: RS232, IIC and CAN protocols,

III. Develop Control Applications such as: Temperature controller, Elevator controller, Traffic Controller.

2. Development and Porting of Real time applications on to Target machines such as Intel or other Computers using any RTOS.

I. Understanding Real Time Concepts using any RTOS through demonstration of:

a) Timing
b) Multi-tasking
c) Semaphores
d) Message Queues
e) Round-Robin Task Scheduling
f) Preemptive Priority based Task Scheduling
g) Priority Inversion
h) Signals
i) Interrupt Service Routines

II. Applications development using any RTOS:

a) Any RTOS Booting.
b) Application Development under any RTOS.



M.J.C.E.T.

**CS 433**

## PROJECT SEMINAR

Instruction 3 Periods per week
Sessional 25 Marks

The department can initiate the project allotment procedure at the end of III year 2nd semester and finalize it in the first two weeks of IV year Ist semester.

First 4 weeks of IV year Ist semester will be spent on special lectures by faculty members, research scholars, postgraduate students of the department and invited lecturers by engineers from industries and R&D institutions. The objective of these preliminary talks will be to expose the students to real life practical problems and methodology to solve the technical problems.

Seminar schedule will be prepared by the coordinator for all the students from 5th week to the last week of the seminar which should be strictly adhered to.

***Each student will be required to :***

1. Submit a one page synopsis before the seminar for display on notice board.
2. Give a 20 minute presentation followed by 10 minutes discussion.
3. Submit a technical write-up on the tal.

Atleast two teachers will be associated with the Project Seminar to evaluate students for the award of sessional marks which will be on the basis of performance in all the 3 items stated above.

***The seminar presentation should include the following components of the project :***

- Problem definition and specification.
- Literature survey, familiarity with research journals.
- Broad knowledge of available techniques to solve a particular problem.
- Planning of the work, preparation of bar (activity) charts
- Presentation - oral and written.

*Note : Three periods of contact load will be assigned to each project guide.*





## SCHEME OF INSTRUCTION & EXAMINATION

### B.E. IV - YEAR
### (COMPUTER SCIENCE & ENGINEERING)

### SEMESTER - II

| Sl. No. | Syllabus Ref. No. | SUBJECT | Scheme of Instruction: Periods per week L | Scheme of Instruction: Periods per week D/P | Scheme of Examination: Duration In Hours | Scheme of Examination: Maximum Marks: Univ. Exam | Scheme of Examination: Maximum Marks: Sessionals |
|---|---|---|---|---|---|---|---|
| | | **THEORY** | | | | | |
| 1 | CS 451 | Data Mining | 4 | - | 3 | 75 | 25 |
| 2 | | ELECTIVE –II | 4 | - | 3 | 75 | 25 |
| 3 | | ELECTIVE-III | 4 | - | 3 | 75 | 25 |
| | | **PRACTICALS** | | | | | |
| 1 | CS 481 | Data Mining lab | - | 3 | 3 | 50 | 25 |
| 2 | CS 482 | Seminar | - | 3 | - | - | 25 |
| 3 | CS 483 | Project | - | 6 | Viva Voce | Gr* | 50 |
| | | **Total** | **12** | **12** | — | **275** | **175** |

**Excellent/Very Good/ Good/Satisfactory/Unsatisfactory*

**ELECTIVE-II**

CS 461 Simulation & Modeling
ME 404 Operations Research
CS 463 Software Quality and Testing
CS 464 Information Storage and Management
CS 465 Human Computer Interaction
CS 466 Software Reuse Techniques
ME 411 Entrepreneurship

**ELECTIVE-III**

CS 471 Information Retrieval Systems
CS 472 Semantic Web
LA 454 Intellectual Property Rights
CS 474 Advanced Databases
CS 475 Multimedia Systems
CS 476 Cloud Computing
CE 452 Disaster Mitigation and Management



M.J.C.E.T.