M.E., COMPUTER SCIENCE & ENGINEERING

SYLLABUS
CHOICE BASED CREDIT SYSTEM FOR M.E(CS) FULL-TIME / PART TIME MODE PROGRAMME

ELIGIBILITY

Candidates for the admission to the first year course leading to the degree of M.E(CS) will be required to possess:

1. A pass in B.E / B.Tech degree examination in Computer Science and Engineering (or) Information Technology (or) Electrical and Electronics Engineering (or) Electronics and Instrumentation (or) Electronics and Communication Engineering with atleast 50% of marks. (or)

2. A pass in M.Sc in Computer Science or Information Technology with atleast 50% of marks. (or)

3. A pass in M.C.A with atleast 50% of marks.

CREDITS

Each course is normally assigned one credit per lecture per week and one credit for two periods of tutorials or part thereof for laboratory or practical per week.

Each semester curriculum shall normally have a blend of theory and practical courses. The Total credits for the entire degree course will be 80. For the award of the degree a student has to earn a minimum of 80 credits.
DURATION OF THE PROGRAMME

A student is normally expected to complete M.E(CS) programme in two years in the case of full time and three years for part time mode. But in any case not more than four years for full time and five years for part time mode from the time of admission.

REGISTRATION FOR COURSES

A newly admitted student will automatically be registered for all the courses prescribed for the first semester, without any option.

Every other student shall submit a completed registration form indicating the list of courses intended to be credited during the next semester. This registration will be done a week before the last working day of the current semester. Late registration with the approval of the dean on the recommendation of the head of the department along with a late fee will be done, up to the last working day.

ASSESSMENT

The break-up of assessment and examination marks for theory subjects is as follows.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Assessment (Test)</td>
<td>15</td>
</tr>
<tr>
<td>Second Assessment (Test)</td>
<td>15</td>
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<tr>
<td>Assignment</td>
<td>10</td>
</tr>
<tr>
<td>Examination</td>
<td>60</td>
</tr>
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</table>
The break-up of the assessment and examination marks for practical is as follows.

<table>
<thead>
<tr>
<th>Assessment Type</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Assessment (test)</td>
<td>15</td>
</tr>
<tr>
<td>Second Assessment (test)</td>
<td>15</td>
</tr>
<tr>
<td>Maintenance of record book</td>
<td>10</td>
</tr>
<tr>
<td>Examination</td>
<td>60</td>
</tr>
</tbody>
</table>

The project work will be carried out in the final semester in two phases: first phase in pre-final semester and second phase in final semester. The project work will be assessed for 40 marks by a committee consisting of the guide and a minimum of two members nominated by the head of the department. The head of the department may himself be a member or the chairman. 60 marks are allotted for the project work and viva voce examination at the end of the final semester.

**STUDENT COUNSELLOR**

To help the students in planning their course of study and for general advice on the academic programme, the head of the department will attach a certain number of students to a member of the faculty who shall function as student counsellor for those students throughout their period of study. Such student counsellors shall advise the students, give preliminary approval for the courses to be taken by the students during each semester and obtain the final approval of the head of the department.
CLASS COMMITTEE

For each semester separate class committee will be constituted by the head of the department. The composition of the class committee will be as follows.

Course co-ordinators of the entire course shall be appointed by the head of the department from among the staff members teaching the course.

A project co-ordinator shall be appointed by the head of the department from among the project supervisors.

Teaching staff of other individual courses

One professor or reader, preferably not teaching the concerned class, appointed by the head of the department.

The head of the department may opt to be a member or the chairman.

All student counsellors of the class, and the head of the department (if not already a member) or any staff member nominated by the head of the department may opt to be special invitees.

The class committee shall meet three times during the semester

The first meeting will be held within two weeks from the date of class commencement in which type of assessment like test, assignment etc for the first and second assessments and the dates of completion of the assessments will be decided.

The second meeting will be held within a week after the completion of the first assessment to review the performance and for follow-up action.
The second meeting will be held within a week after the second assessment is completed to review the performance and for follow-up action.

The third meeting will be held after all the assessments are completed for all the courses, and at least one week before the commencement of the examinations. During this meeting the assessment on a maximum of 40 marks will be finalised for every student and tabulated and submitted to the head of the department for approval and transmission to the controller of examinations.

**WITHDRAWAL FROM A COURSE**

A student can withdraw from a course at any time before a date fixed by the head of the department prior to the second assessment, with the approval of the dean of the faculty on the recommendation of the head of the department.

**TEMPORARY BREAK OF STUDY**

A student can take a one-time temporary break of study covering the current year / semester and / or the next semester with the approval of the dean on the recommendation of the head of the department, not later than seven days after the completion of the mid-semester test. However, the student must complete the entire programme within the maximum period of four years for part time mode and five years for part time mode.
SUBSTITUTE ASSESSMENT

A student who has missed, for genuine reasons accepted by the head of the department, one or more of the assessments of a course other than the examination, may take a substitute assessment for any one of the missed assessments. The substitute assessment must be completed before the date of the third meeting of the respective class committees.

A student who wishes to have a substitute assessment for a missed assessment must apply to the head of the department within a week from the date of the missed assessment.

ATTENDANCE REQUIREMENTS

To be eligible to appear for the examination in a particular course, a student must put in a minimum of 80% of attendance in the course. However, if the attendance is 70% or above but less than 80% in any course, the authorities can permit the student to appear for the examination in the course on payment of the prescribed condonation fee.

A student who withdraws from or does not meet the minimum attendance requirement in course must re-register for and repeat the course.

PASSING AND DECLARATION OF EXAMINATION RESULTS

All assessments of all the courses on the absolute mark basis will be considered and pass by the results passing board in accordance with the rules of the university. Thereafter, the controller of examinations shall convert the marks for each courses to the corresponding letter grade as follows, compute the grade point average and cumulative grade point average, and prepare the grade cards.
90 to 100 marks - Grade ‘S’
80 to 89 marks - Grade ‘A’
70 to 79 marks - Grade ‘B’
60 to 69 marks - Grade ‘C’
55 to 59 marks - Grade ‘D’
50 to 54 marks - Grade ‘E’
less than 50 marks - Grade ‘F’
Insufficient attendance - Grade ‘I’
Withdrawn from the course - Grade ‘W’

A student who obtains less than 50 marks out of 100 in the subject or is absent for the examination will be awarded Grade ‘F’.

A student who earns a grade of S,A,B,C,D or E for a course is declared to have successfully completed that course and earned the credits for that course. Such a course cannot be repeated by the student.

A student who obtains letter grade F in a course has to reappear for the examination in that course.

A student who obtains letter grade I or W in a course has to re-register for and repeat the course.

The following grade points are associated with each letter grade for calculating the grade point average.

S – 10;  A-9;  B-8;  C-7;  D-6;  E-5;  F-0

Course with grades I and W are not considered for calculation of grade point average or cumulative grade point average. F Grade will be considered for computing GPA and CGPA.
A student can apply for retotalling of one or more of his examination answer papers within a week from the date of issue of grade sheet to the student on payment of the prescribed fee per paper. The application must be made to the controller of examinations with the recommendation of the head of the department.

After results are declared, grade cards will be issued to the students. The grade card will contain the list of courses registered during the semester, the grades scored and the grade point average (GPA) for the year/semester.

GPA is sum of the products of the number of credits of a course with the grade point scored in that course, taken over all the courses for the Semester, divided by the sum of the number of credits for all courses taken in that semester. CGPA is similarly calculated considering all the courses taken from the time of admission.

After successful completion of the programme, the degree will be awarded with the following classification based on CGPA.

For First Class with Distinction the student must earn a minimum of 80 credits within two years for full time mode and three years for part time mode from the time of admission, pass all the courses in the first attempt and obtain a CGPA of 8.25 or above.

For First Class the student must earn a minimum of 80 credits within three years for full time mode and four years for part time mode from the time of admission and obtain a CGPA of 6.5 or above.

For Second Class the student must earn a minimum of 80 credits within four years for full time mode and five years for part time mode from the time of admission.
ELECTIVES

Apart from the various elective courses offered in the curriculum of the branch of specialisation, a student can choose electives from any specialisation under the faculty during the entire period of study, with the approval of the head of the department offering the course. Some of the electives have lab components along with theory and hence have more credits than the electives which are only theoretical.
## Course Contents and Scheme of Examination
### For Full Time Mode

### I Semester

<table>
<thead>
<tr>
<th>Sub.Code</th>
<th>Subject</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>Duration of Exam (Hours)</th>
<th>Maximum Marks</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMC1FT091</td>
<td>Mathematical Foundation for Computer Science</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>40 60 100</td>
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</tr>
<tr>
<td>EMC1AT092</td>
<td>Advanced Software Engineering</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>40 60 100</td>
<td>3</td>
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<tr>
<td>EMC1AT093</td>
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<td>40 60 100</td>
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<tr>
<td>EMC1AT094</td>
<td>Advanced Data Communication &amp; Computer Networks</td>
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<td>1</td>
<td>0</td>
<td>3</td>
<td>40 60 100</td>
<td>4</td>
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<tr>
<td>EMC1AT095</td>
<td>Advanced Data Structures &amp; Algorithms</td>
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<td>40 60 100</td>
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<td>40 60 100</td>
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**Minimum requirement**: 22

### II Semester

<table>
<thead>
<tr>
<th>Sub.Code</th>
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<th>T</th>
<th>P</th>
<th>Duration of Exam (Hours)</th>
<th>Maximum Marks</th>
<th>C</th>
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<tbody>
<tr>
<td>EMC2AT091</td>
<td>Internet Programming &amp; Tools</td>
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<td>40 60 100</td>
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<tr>
<td>EMC2AT093</td>
<td>Agent Based Intelligent Systems</td>
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<td>40 60 100</td>
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</table>

**Minimum requirement**: 22

*L – Lecture Credits   T – Tutorial Credits   P - Practical Credits   C - Total Credits*
### III SEMESTER

<table>
<thead>
<tr>
<th>Sub.Code</th>
<th>Subject</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>Duration of Exam (Hours)</th>
<th>Maximum Marks</th>
<th>C</th>
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<tbody>
<tr>
<td>EMC3AT091</td>
<td>Software Project Management System</td>
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<td>EMC3AT092</td>
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<tr>
<td>EMC3AT093</td>
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</tbody>
</table>

**Electives:**

Some of the electives have lab components along with theory and hence have 5 credits (Lecture - 3 Tutorial - 0 Lab - 4 and Total 5 credits) and the electives which are only theoretical have 4 credits. (Lecture - 3 Tutorial - 1 Lab - 0 and Total 4 credits)

### IV SEMESTER

<table>
<thead>
<tr>
<th>Sub.Code</th>
<th>Subject</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>Duration of Exam (Hours)</th>
<th>Maximum Marks</th>
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</tbody>
</table>

L – Lecture Credits   T – Tutorial Credits   P - Practical Credits   C- Total Credits
# COURSE CONTENTS AND SCHEME OF EXAMINATION
## FOR PART TIME MODE

### I SEMESTER

<table>
<thead>
<tr>
<th>Sub.Code</th>
<th>Subject</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>Duration of Exam (Hours)</th>
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<tr>
<td>EMPC1FT091</td>
<td>Mathematical Foundation for Computer Science</td>
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<td>EMPC1AT092</td>
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<tr>
<td>EMPC1AT093</td>
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- **L** – Lecture Credits  
- **T** – Tutorial Credits  
- **P** – Practical Credits  
- **C** – Total Credits

### II SEMESTER

<table>
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<tr>
<th>Sub.Code</th>
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<tbody>
<tr>
<td>EMPC2AT091</td>
<td>Advanced Data Communication &amp; Computer Networks</td>
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- **L** – Lecture Credits  
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### III SEMESTER

<table>
<thead>
<tr>
<th>Sub.Code</th>
<th>Subject</th>
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<tr>
<td>EMPC3AT091</td>
<td>Internet Programming &amp; Tools</td>
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- **L** – Lecture Credits  
- **T** – Tutorial Credits  
- **P** – Practical Credits  
- **C** – Total Credits

**Minimum requirement**

- **L** – Lecture Credits  
- **T** – Tutorial Credits  
- **P** – Practical Credits  
- **C** – Total Credits

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### IV SEMESTER

<table>
<thead>
<tr>
<th>Sub.Code</th>
<th>Subject</th>
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**Minimum requirement**

15

### V SEMESTER

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**Project Work Phase – I**

Electives:

Some of the electives have lab components along with theory and hence have 5 credits (Lecture - 3 Tutorial - 0 Lab - 4 and Total 5 credits) and the electives which are only theoretical have 4 credits. (Lecture - 3 Tutorial - 1 Lab - 0 and Total 4 credits)

### VI SEMESTER

<table>
<thead>
<tr>
<th>Sub.Code</th>
<th>Subject</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>Duration of Exam (Hours)</th>
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</table>

**Minimum requirement**

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L – Lecture Credits     T – Tutorial Credits     P - Practical Credits     C- Total Credits
SEMESTER – I
UNIT – I LOGIC


UNIT – II COMBINATORICS

Review of Permutation and Combination - Mathematical Induction - Pigeon hole principle - Principle of Inclusion and Exclusion - generating function - Recurrence relations.

UNIT – III ALGEBRAIC STRUCTURES

Semi group - Monoid - Groups(Definition and Examples only) Cyclic group - Permutation group(Sn and Dn) - Substructures - Homomorphism of semi group, monoid and groups - Cosets and Lagrange Theorem – Normal Subgroups - Rings and Fields (Definition and examples only)

UNIT – IV RECURSIVE FUNCTIONS

Recursive functions - Primitive recursive functions - computable and non - computable functions.

UNIT – V LATTICES

Partial order relation, poset - Lattices, Hasse diagram - Boolean algebra

TEXT BOOK


REFERENCES

UNIT – I INTRODUCTION


UNIT – II REQUIREMENTS ANALYSIS

Prototyping - Specification - Analysis modeling

UNIT – III SOFTWARE DESIGN

Software design - Abstraction - Modularity - Software Architecture - Effective modular design - Cohesion and Coupling - Architectural design and Procedural design - Data flow oriented design.

UNIT – IV USER INTERFACE DESIGN AND REAL TIME SYSTEMS


UNIT – V SOFTWARE QUALITY AND TESTING

Software Quality Assurance - Quality metrics - Software Reliability - Software testing - Path testing – Control Structures testing - Black Box testing - Integration, Validation and system testing - Software Maintenance - Reverse Engineering and Re-engineering. CASE tools - projects management, tools - analysis and design tools - programming tools - integration and testing tool - Case studies.

TEXT BOOK


REFERENCES

DISTRIBUTED OPERATING SYSTEMS

UNIT I - OVERVIEW OF OPERATING SYSTEMS

Introduction – overview of operating system concepts – Process management and Scheduling, Memory management: partitioning, paging, segmentation, virtual memory, Device and File management.

UNIT II - DISTRIBUTED COMPUTING


UNIT III - SYNCHRONIZATION AND PROCESSES


UNIT IV - SHARED MEMORY AND FILE SYSTEMS


UNIT V - CASE STUDY – AMOEBA

Introduction to Amoeba – Object and Capabilities – memory management – Communication – Amoeba Servers.

TEXT BOOK


REFERENCES


UNIT – I


UNIT – II

Encoding and Decoding Technique – Transmission media – Performance – Channelization – FDMA, TDMA, CDMA – Peer to peer protocol Other Adaptation Function – Data link Controls.

UNIT – III


UNIT – IV


UNIT – V


TEXT BOOK


REFERENCES

ADVANCED DATA STRUCTURES AND ALGORITHMS

UNIT - I
INTRODUCTION

Growth – of functions summations – formulas and properties, Recurrences

UNIT – II
SORTING

Heap sort – Quick sort – radix sort – bucket sort, Analysis of sort techniques.

UNIT – III
DATA STRUCTURE

Arrays – linked lists – stacks – queues, representation of sets, has tables, binary search trees, red-black trees, splay trees.

UNIT – IV
ALGORITHMS & ANALYSIS

Dynamic programming, Greedy algorithms, Introduction to parallel algorithms, Amortized analysis, String matching algorithms, the native – the Rabin karp.

UNIT – V
ADVANCED DATA STRUCTURE


TEXT BOOK


REFERENCES

1. Implementation of Singly, Doubly and Circular linked list.
2. Implementation of Multistack in a Single Array.
5. Implementation of Hash table.
8. Implementation of Breadth First Search Techniques.
10. Implementation of Prim’s Algorithm.
11. Implementation of Dijkstra’s Algorithm.
12. Implementation of Kruskal’s Algorithm
13. Implementation of Searching Techniques
14. Implementation of Sorting Techniques
SEMESTER – II
INTERNET PROGRAMMING AND TOOLS

UNIT I BASIC INTERNET CONCEPTS

History of internet-Internet addressing-TCP/IP-DNS and directory services-Interne Applications-Electronic mail, New groups UUCP, FTP, Telnet, Finger.

UNIT II WORLD WIDE WEB


UNIT III SCRIPTING LANGUAGES

Java Script Programming-Dynamic HTML-Cascading style sheets-Object model and Event model- Filters and Transitions-Active X Controls-Multimedia-Client side scri.

UNIT IV SERVER SIDE PROGRAMMING


UNIT V CASE STUDY – AMOEBA


TEXT BOOK


REFERENCES

PARALLEL COMPUTER ARCHITECTURE

UNIT – I
Parallel computer models: Multiprocessors and multiprocessors and multi computer – Multi vector and SIMD computer, conditions of parallelism, System interconnect architectures performance. Metrics and measures.

UNIT - II
Advanced processor technology – Super scalar and vector processors – Memory hierarchy technology, virtual memory technology – cache memory organization – shared – memory organization.

UNIT – III
Linear pipeline processors - Nonlinear pipeline processors – Instruction pipeline design
Arithmetic pipeline design – Superscalar pipeline design.

UNIT – IV
Multiprocessor system interconnects – Cache coherence, Vector processing principle
Compound Vector processing, SIMD computer organization, multiprocessor operating system, multiprocessor examples.

UNIT – V

TEXT BOOK

REFERENCE
UNIT – I INTRODUCTION

UNIT – II KNOWLEDGE BASED AGENTS
Representation - Logic-First order logic - Reflex Agent - Building a knowledge Base - General Ontology - Inference - Logical Recovery.

UNIT – III PLANNING AGENTS
Situational Calculus - Representation of Planning - Partial order Planning- Practical Planners – Conditional Planning - Replanting Agents.

UNIT – IV AGENTS AND UNCERTAINTY
Acting under uncertainty - Probability Bayes Rule and use - Belief Networks - Utility Theory - Decision Network- Value of Information - Decision Theoretic Agent Design.

UNIT – V HIGHER LEVEL AGENTS

REFERENCES
Implementing Java components  Practicing RMI, JDBC, JSP Multithreading and animation concepts

1. Exercises on creating HTML pages
2. Implementation of Package Bio-Data
3. Shapes Class Hierarchy
4. Animation using Java Applets
5. Multi Threaded implementation of Producer Consumer Problem
6. Implementation of simple TCP/IP Client and server
7. Operations on Employee table using JDBC
8. Bubble sort implementation using RMI
9. Constructing a simple database using XML
10. An interactive Web application in JSP
11. Using cookies to track users in browsers from the web servers
12. Constructing a secured FTP client – server application
SEMESTER – III
SOFTWARE PROJECT MANAGEMENT

UNIT I
Introduction—software projects—various types of projects—problems with software projects—an overview of project planning—project evaluation—project analysis and technical planning—software estimation.

UNIT II
Activity planning—project schedules—sequencing and scheduling projects—network planning model—shortening project duration identifying critical activities

UNIT III
Risk Management—resource allocation—monitoring and control—managing people and organizing teams—planning for small projects

UNIT IV
Software Configuration Management—basic functions—responsibilities—standards—configuration management—prototyping models of prototyping.

UNIT V
Case Study—PRINCE project management.

TEXT BOOK

REFERENCES
MOBILE COMPUTING

UNIT – I INTRODUCTION


UNIT – II WIRELESS LAN

Infrared Vs radio transmission – IEEE 802.11 – HIPERLAN – Bluetooth.

UNIT – III WIRELESS ATM


UNIT – IV MOBILE NETWORKS AND TRANSPORT LAYER


UNIT – V SUPPORT FOR MOBILITY


TEXT BOOK

1. Mobile Communications – Jochen Schiller, Pearson Education.

REFERENCES

1. hptt:\www.bluetooth.com
OBJECT ORIENTED ANALYSIS & DESIGN

UNIT – I OBJECT ORIENTED DESIGN FUNDAMENTALS

The object Model - Classes and Objects - Complexity - Classification - Notation - Process - Pragmatics – Binary and entity relationship - object types - object state - OOSD life cycle.

UNIT – II OBJECT ORIENTED ANALYSIS

Overview of object oriented analysis - Shaler/Mellor, Coad/ Yourdon, Rumbaugh, Booch - UML - Usecase - Conceptual model - behaviour - class - analysis patterns - overview - diagrams - aggregation.

UNIT – III OBJECT ORIENTED DESIGN METHODS

UML - diagrams - collaboration - Sequence - Class - design patterns and frameworks - comparison with other design methods.

UNIT – IV MANAGING OBJECT ORIENTED DEVELOPMENT

Managing analysis and design - Evaluation testing - coding - Maintenance - Metrics.

UNIT V CASE STUDIES IN OBJECT ORIENTED DEVELOPMENT

Design of Foundation class libraries - Object Oriented Databases - Client/Server Computing - Middleware.

TEXT BOOK


REFERENCES

SEMESTER – IV
PROJECT PHASE – I & II

The student is supposed to carry out a project in two phases the first phase in pre final semester. The student has to do the analysis and design part in phase – I and produce a documentation of the design with the details up to System Planning and Design. In Phase – II the System Implementation has to be carried out and the Complete project report has to be submitted with the following details.

1. Introduction
   1.1 Abstract
   1.2 About the organization
   1.3 Existing system
   1.4 Drawbacks of the existing system
   1.5 Proposed system

2. System Requirements
   2.1 Selection of software and language
   2.2 Selection of hardware

3. System Planning and Design
   3.1 Overall System Design structure
   3.2 Data Flow diagram
   3.3 Process design
   3.4 Database design

4. System implementation
   4.1 Methodology used for Testing
   4.2 System implementation

5. User Manual
   1.1 Screen Shots
   1.2 Reports

6. Conclusion
   Scope for further development and Conclusion

7. Bibliography

Appendix
Sample Coding
ELECTIVES
## List of Electives

<table>
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<tr>
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</table>
NEURAL NETWORKS

UNIT – I BACK PROPAGATION
Introduction to Artificial Neural Systems - Perceptron - Representation - Linear reparability - Learning – Training algorithm - The back propagation network - The generalized delta rule - Practical considerations – BPN applications.

UNIT – II STATISTICAL METHODS

UNIT – III COUNTER PROPAGATION NETWORK AND SELF ORGANIZING MAPS
CPN building blocks - CPN data processing. SOM data processing - Applications.

UNIT IV - ADAPTIVE RESONANCE THEORY AND SPATIO TEMPORAL PATTERN CLASSIFICATION
ART network description - ART1 - ART2 - Application. The formal avalanche - Architecture of spatio temporal networks - The sequential competitive avalanche field - Applications of STNs.

UNIT – V NEO – CONGNITRON
Cognitron - Structure & training - The neocognitron architecture - Data processing - Performance - Addition of lateral inhibition and feedback to the neocognitron. Optical neural networks - Holographic correlators.

TEXT BOOK

MULTIMEDIA SYSTEM

UNIT – I INTRODUCTION
Multimedia applications - System architecture - Objects of Multimedia Systems - Multimedia databases.

UNIT – II COMPRESSION AND FILE FORMATS
Types of compression - Image compression - CCITT - JPEG - Video image compression - MPEG-DVI Technology - Audio compression - RTF format - TIFF file format - RIFF file format - MIDI - JPEG DIB - TWAIN.

UNIT – III INPUT/OUTPUT TECHNOLOGIES
Traditional devices - Pen input - Video display systems - Scanners - Digital audio - Video images and animation.

UNIT – IV STORAGE AND RETRIEVAL

UNIT – V APPLICATION DESIGN
Application classes - Types of systems - Virtual reality design - Components - Databases - Authoring Systems - Hypermedia - User interface design - Display/Playback issues - Hypermedia linking and embedding.

TEXT BOOK

REFERENCES
MOBILE NETWORKING

UNIT - I
INTRODUCTION

Medium Access Control – Introduction to Telecommunication and Satellite systems – Broadcast systems.

UNIT - II
WIRELESS LAN

Infrared Vs radio transmission – IEEE 802.11 – HIPERLAN Bluetooth.

UNIT - III
WIRELESS ATM


UNIT - IV
MOBILE NETWORK AND TRANSPORT LAYER


UNIT - V
SUPPORT FOR MOBILITY


TEXT BOOK

1. Mobile Communications – Jochen Schiller, Pearson Education.

REFERENCES

COMPONET BASED SYSTEM DESIGN

UNIT - I
BASIC COMPONENTS


UNIT - II
BASIC PATTERNS and INHERNET ISSUES


UNIT - III
CORBA OVRVIEW


UNIT - IV
JAVA PROGRAMMING WITH CORBA

Overview of Java ORBs – First Java ORB Application – OMG IDL to Java Mapping – ORB Run – Time System Discovering Service (naming Trading) – Building Applications – Advance Feature (DSI, DII, Interface Depository) CORBA Events

UNIT - V
COM OVERVIEW


TEXT BOOK:

1. Java Programming with CORBA 3rd Education Gerald Brose, Andreas Vogel, Keith Duddy. Wliey Dramtech India Pvt Ltd.,
2. Inside COM, Dale Rogerson Microsoft Press
DISCRETE MATHEMATICS

UNIT I
MATHEMATICAL LOGIC


UNIT II
SET THEORY


UNIT III
RECURRENCE RELATION & ALGEBRAIC SYSTEMS


Groups – Cyclic groups and subgroups – Normal subgroups – Coding theory – Group codes.

UNIT IV
GRAPH THEORY


UNIT V
BOOLEAN ALGEBRA & FORMAL LANGUAGES

Boolean algebra – Posets – Lattices – Application of Boolean Algebra to switching theory. Languages – Recognition and generation - Phase structure grammars and languages – Finite state Machine – Recognition in regular languages
TEXT BOOK

1. Alan Doerr and Kenneth Levasseur, “Applied Discrete Structures for Computer Science”, Galgotia Publications (P) Ltd. (Unit I – Chapter 3 Section 3.1 – 3.8, Unit II – Chapter 2, Chapter 4 Section 4.2 – 4.5, Chapter 6 Section 6.1, 6.2, 6.4, 6.5, Chapter 7, Unit III – Chapter 8 Section 8.3, 8.4 Chapter 11 Section 11.25 Chapter 15 Section 15.1, 15.2, 15.4 15.5, Unit IV – Chapter 9, Section 9.1 – 9.5, Chapter 10 Section 10.1 – 10.5, Unit V – Chapter 13 Section 13.1–13.3, 13.7, Chapter 14 Section 14.2, 14.3)

REFERENCES


DATA MINING AND WAREHOUSING

UNIT I

DATA WAREHOUSE:
Evolution of Data base Technology – Definition: Data Warehouse - Differences between Operational Data base systems and Data Warehouses - Multidimensional Data Model - OLAP Operations - Warehouse Schema - Data Warehousing Architecture - Warehouse Server – Metadata - OLAP engine - The tasks in Building a Data Warehouse - Data warehouse backend Process – Data warehouse applications

UNIT II

DATA MINING:

UNIT III

DATA MINING QUERY LANGUAGE AND ARCHITECTURE:
Data Mining Query Language - Other data mining Languages and the standardization of data mining primitives - Four Generations of Data Mining Systems - Architectures of Data Mining Systems.

UNIT IV

WEB MINING
Web Mining - Web Content Mining – Web structure mining – Web Usage mining

UNIT V

APPLICATION ,PRODUCT AND CASE STUDIES
Data warehousing and mining Applications - Products - Case studies - The Future of Data Mining - Privacy and Security of Data Mining

TEXT BOOK

2. Morgrat A. Dunham , “ Introduction to Data Mining techniques”, Pearson Education
REFERENCES


Note: Algorithm Not Included
SOFTWARE QUALITY MANAGEMENT SYSTEM

UNIT I
INTRODUCTION

Concepts of Quality Control, Quality Assurance, Quality Management - Total Quality Management; Cost of Quality; QC tools - 7 QC Tools and Modern Tools; Other related topics - Business Process Re-engineering - Zero Defect, Six Sigma, Quality Function Deployment, Benchmarking, Statistical process control.

UNIT II
SOFTWARE ENGINEERING PRINCIPLES


UNIT III
SOFTWARE QUALITY ASSURANCE MODELS


UNIT IV
SOFTWARE PROCESSES & TESTING

Software Process - Definition and implementation; internal Auditing and Assessments; Software testing - Concepts, Tools, Reviews, Inspections & Walkthroughs; P-CMM.

UNIT V
TQM

TEXT BOOK


REFERENCES

MANAGEMENT INFORMATION SYSTEM

UNIT I
Definition of MIS- Data Processing , Decision Support Systems – Information Resources Management , End user Computing Managerial Accounting , OR Management theory Sub Systems of MIS.

Communication systems, Front End Processors, LAN , WAN , Distributed Systems.

UNIT II
Logical Data Concepts , Sequencing of Data , Types of Files , Data Bases .Serial Access and Direct Access devices.


UNIT III

UNIT IV
Types of system – Subsystem- Preventing System entropy – System Stress – Organizational efficiency and effectiveness
Use of subsystems in information System Design – Decoupling of information systems – Project Management.
UNIT V - 15


Total Periods : 75

TEXT BOOK


REFERENCES


NETWORK SECURITY

UNIT – I
INTRODUCTION

Attacks, Services, and Mechanisms – Conventional Encryption model – Classical and Modern techniques – Encryption Algorithms – Confidentiality

UNIT – II
PUBLIC KEY ENCRYPTION


UNIT III
NETWORK SECURITY PRACTICES


UNIT IV
WEB SECURITY


UNIT V
SYSTEM SECURITY


TEXT BOOK


REFERENCES

COMPUTER GRAPHICS

UNIT – I

Introduction to computer graphics - Input and output devices - Video monitors - Raster and Random scan display and systems. 
Output primitives - Line and circle drawing algorithms - Polygon filling algorithms

UNIT – II

Two-dimensional transformation – Clipping and windowing – Clipping algorithms – Line clipping, Polygon Clipping, Curve clipping and Text clipping.
Three dimensional concepts – 3D transformations

UNIT – III

Three-dimensional object representation – Polygonal representations, Spline representation, Bezier Curves and surfaces – Quadtree and Octrees.
3D – Viewing – Parallel and Perspective Viewing

UNIT – IV

View volumes- 3D clipping – Hidden – surface and Hidden-line elimination.
Illumination and shading- Gouraud and Phong shading

UNIT – V

Color models and applications-RGB, YIQ, CMY, HSV, HLS and CIE models.
Computer Animation.

TEXT BOOK


REFERENCES

GRID COMPUTING

UNIT I
INTRODUCTION
Grid Computing values and risks – History of Grid computing – Grid computing model and protocols – overview of types of Grids

UNIT II
TYPES OF GRIDS
Desktop Grids: Background – Definition – Challenges – Technology – Suitability – Grid server and practical uses; Clusters and Cluster Grids; HPC Grids; Scientific in sight – application and Architecture – HPC application development environment and HPC Grids; Data Grids; Alternatives to Data Grid – Data Grid architecture.

UNIT III
ARCHITECTURE AND MANAGEMENT

UNIT IV
NATIVE PROGRAMMING AND SOFTWARE APPLICATIONS

UNIT V
APPLICATIONS, SERVICES AND ENVIRONMENTS

TEXT BOOK

REFERENCES
2. Foster, “Grid Blueprint for new computing”.

E-COMMERCE

UNIT I
INTRODUCTION

UNIT II
CORE TECHNOLOGY

UNIT III
ELECTRONIC PAYMENT SYSTEMS

UNIT IV
SECURITY

UNIT V
INTER/INTRA ORGANIZATIONS ELECTRONIC COMMERCE

TEXT BOOK

REFERENCES

NATURAL LANGUAGE PROCESSING

UNIT I
INTRODUCTION

Introduction to NLP – Computational Models of Language – Organization of NLP Systems

UNIT II
PARSING


UNIT III
SEMANTICS


UNIT IV
KNOWLEDGE REPRESENTATION


UNIT V
CASE STUDY

Indian Language Processing – Approach to Machine Translation – Typical Case Studies

TEXT BOOK

REFERENCES
TCP/IP TECHNOLOGY

UNIT I
INTRODUCTION


UNIT II
IP ADDRESSES, ROUTING, ARP AND RARP


UNIT III
IP, ICMP, TGMP AND UDP


UNIT IV
TCP, UNICAST AND MULTICAST ROUTING PROTOCOLS


UNIT V
APPLICATION LAYER, SOCKETS


TEXT BOOK


REFERENCES

ADVANCED DATABASE MANAGEMENT SYSTEM

UNIT I
BASIC CONCEPTS
Basic Concepts : Databases and Database users – Database system concepts and architecture – Data modeling using Entity Relationship model – Generalization and specialization – Record storage and file organizations- Index structures for files.

UNIT II

UNIT III

UNIT IV
Distributed Database – Types of Distributed Database Systems – Query processing in Distributed Database – Client Server architecture and its relationship to Distributed Database.

UNIT V
DATA WAREHOUSE AND DATA MINING
Evolution of Database Technology – Definition: Data Warehouse - Differences between Operational Database systems and Data Warehouses - Multidimensional Data Model - OLAP Operations - Warehouse Schema - Data Warehousing Architecture - Warehouse Server – Metadata - OLAP engine - The tasks in Building a Data Warehouse - Data warehouse backend Process – Data warehouse applications


TEXT BOOK

REFERENCES
1. KORTH and SILBERSCHATZ, Database system concepts – Tata McGraw Hill
2. Morgrat A. Dunham , “Introduction to Data Mining techniques”, Pearson Education
ARTIFICIAL INTELLIGENCE

UNIT I

ARTIFICIAL INTELLIGENCE -
Some Applications of AI - Production Systems and AI-Different types of Production Systems-Search Strategies for AI-Backtracking-Graph-search, Ununiformed and Heuristic Graph-Search Procedures-Related Algorithms-Applications.

UNIT II

INTRODUCTION TO NEURAL COMPUTING
Differences between Human Brain and ANN - Knowledge Based Information Processing - Neural Information Processing - Hybrid Intelligence - Basic Concepts of Neural Networks - Inference and Learning - Classification, Association, Optimization and Self-Organization Models-Learning-Supervised And Unsupervised.

UNIT III

FUZZY SYSTEMS
Crisp sets and Fuzzy sets - Notion of Fuzzy Sets - Basic Concepts - Operations on Fuzzy sets-Uncertainty and Information - Types of Uncertainty -Principles of Uncertainty and Information -Applications.

UNIT IV

NEURO - FUZZY SYSTEMS

UNIT V

GENETIC ALGORITHMS
Introduction - Robustness of Traditional Optimization and Search Techniques-The goals of optimization-Computer Implementation-Applications.
TEXT BOOK


REFERENCES

3. David E. Goldberg, "Genetic Algorithms - In Search, optimization and Machine Learning", Pearson Education
XML AND WEB SERVICES

UNIT - I
FUNDAMENTALS

Introduction to the web - Web- enabling Technologies - Web service Protocol - Web Design concepts - Examining good and bad web design - Page Design Resources.

UNIT - II
SIMPLE DESIGN ISSUES


UNIT - III
ADVANCE DESIGN ISSUED

Advanced Page design - tables and frames - preparing graphics and animations forms - cascading style sheets - user interface design - page grid - page templates - usability testing.

UNIT - IV
SCRIPTING IN DESIGN

Typography and Graphic design for the web - Creating transparent GIF - Lean graphics - Image maps – Palette map - Web programming - Web site Garage - W3C HTML validation services - Net mechanic - DHTML - XML.

UNIT - V
TOOLS AND APPLICATIONS

Online Applications - Developing an on-line shopping application - Data Base design issues - connecting Data Base with tools such as Java, ASP, Cold Fusion- Designing Portals and Vortals.

TEXT BOOK

.NET TECHNOLOGIES

UNIT-I
Introduction about the Framework of .NET-Introduction to visual Basic. NET. -Visual Studio Integrated Development Environment, Creating windows, Forms

UNIT-II

UNIT-III
Introduction to ASP.NET-Building Web Forms using Server Controls- Data Binding in ASP.NET-Using Web Services and COM Components-Error Handling and Debugging-State Management and Accessibility Configuring-Securing Web Applications

UNIT-IV
Introduction to C#. NET-Creating simple C# programs-Working With Classes, methods-Programming with Forms and controls-Control Statements-Using types in C#.

UNIT-V
Programming with Exception handling and interface-Arrays and Collections-Properties and Indexers-Writing a Multithreaded application-Deploying the Applications of ASP.NET, VB.NET, C#. NET

TEXT BOOK


2. ASP.NET Bible by Mridula Parihar and et al.
OPEN SOURCE COMPUTING (LAMP)

UNIT-I

Introduction to Web Technologies – Introduction to Linux, Apache, PHP, MySql – Installation and configuration of Apache and MySql servers

UNIT-II

PHP – Embedding PHP in HTML – Calling Functions – Accessing Form Variables – Data Types in PHP- Operators- Control Structures

UNIT-III

Creation and manipulation of Single & Multidimensional Arrays – String manipulation and regular expressions – Writing functions and code reuse – Implementing Object Oriented Concepts in PHP - File processing

UNIT-IV

Introduction to web database architecture – Creating and working with databases in MySql – Accessing MySql Databases from the web with PHP

UNIT-V

Advanced MySql issues including Securing databases – Session Control in PHP – Project creation using PHP and MySql

TEXT BOOK

1. PHP and MySql Web Development by Luke Welling and Laura Thomson