# SUBJECT LIST

*(MCA)*

**V Semester**

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**Elective I:**

- **E-5.1**  Web Development using Open Source Technologies
- **E-5.2**  Computer Oriented Statistical and Numerical Methods
- **E-5.3**  Software testing and Quality Management
- **E-5.4**  Multimedia Tools and Virtual Reality
- **E-5.5**  Human Computer Interaction
- **E-5.6**  Digital Image Processing

**Elective II:**

- **E-6.1**  Optimization Techniques
- **E-6.2**  Distributed System
- **E-6.3**  Management Support System
- **E-6.4**  Bio-Informatics
- **E-6.5**  Network Management and Information Security
- **E-6.6**  Soft Computing
E-1: ERP AND E-BUSINESS

UNIT 1

UNIT 2

UNIT 3

UNIT 4

UNIT 5
ERP modules: finance, plant maintenance, quality management, material management. ERP Implementation Lifecycle, ERP post implementation options, ERP implementation methodology, guidelines for ERP implementation.

Text Books:
1. Frontiers of Electronic commerce – Kalakata, Whinston, Pearson
2. Enterprise Resource Planning – Alexis Leon, TMG

Reference Books:
1. E-commerce – S Jaiswal – Galgotia
2. ERP – Concepts and Practice, Garg and Venkitakrishnan, PHI
E-2: OBJECT ORIENTED ANALYSIS AND DESIGN

UNIT 1

Introduction: traditional paradigm vs object oriented paradigm, the object model – evolution of object model, elements of object model, applying object model, classes and objects – relationship among classes, complexity, notation, process, object types, object state, object oriented system development life cycle.

UNIT 2

Object Oriented Methodologies: introduction, Architecture – model architecture, requirement model, analysis model, design, implementation model, test model. Rumbaugh methodology, Booch methodology, Jacobson methodology, patterns, frameworks, unified approach, iteration and incrementation within the unified process.

UNIT 3

Unified Modeling Language: Use case model – building blocks of use case diagram, actor and roles, relationship between use cases – extend, include, generalize. Modeling with classes – process of creating class diagram, relationships among classes. Modeling with interaction and behavior – interaction diagram (sequence diagram and collaboration diagram), state diagram and activity diagram.

UNIT 4

Object Oriented Analysis: analysis process, Identifying use cases, object analysis, classification, identifying object relationships, attributes and methods, dynamic and functional model.

UNIT 5

Object Oriented Design: Design axioms, designing classes, access layer, object storage, object interoperability, macro and micro level interface design process

Text Books:
2. Object Oriented Analysis and Design with Applications– Grady Booch
3. Object Oriented Modeling and Design– J R Rumbaugh, M R Blaha - Pearson Education

Reference Books:
1. UML 2 Bible – Tom Pender – Wiley Publishing
2. Object Oriented software Engineering – S Mehta, S K Basandra – Galgotia Publishing
E-3: EMBEDDED SYSTEM

UNIT 1
An Overview of Embedded system; Requirements, Challenges, issues, and trends in software development. Application market segments, control system and industrial automation, Data communication, Networked Information Appliances, telecommunications.

UNIT 2
Hardware Architecture: Processor, Memory, Latches and buffers, ADC & DAC, Application specific control, Display units, keypads, DSP.

UNIT 3
Microcontrollers and their applications, Communication interfaces: Serial interface, IEEE 1394, USB, Infra red, Ethernet and PCI bus.

UNIT 4
Embedded system development process: requirement, system architecture, operating system and processes. Development platform and tools, HLL support Cross compilers, Linux and Windows CE based development Tools. Mobile/ handheld systems.

UNIT 5
Basic idea of embedded system application like mobile networks, GPS, Real time system, Database applications, Networked and JAVA-enabled information appliances, Mobile JAVA applications.

Text Books:
1. Embedded systems: Architecture, programming and design by Rajkamal, TMH

Reference Books:
1. Embedded system design by Arnold S Burger. CMP
2. An embedded software primer by David Simon. PEA
E-4: DATA WAREHOUSING AND MINING

UNIT I
Data Warehousing: Introduction, Definition, Multidimensional data transformation, OLAP operations, Ware house schema, Ware house Server, Other features.

UNIT II

UNIT III
Classification: Parametric and non-parametric technology: Bayesian classification, two class and generalized class classification, classification error, Decision boundary, Discriminate functions, Non-parametric methods for classification.

UNIT IV
Clustering: Hierarchical and non-hierarchical techniques, K-MEDOID Algorithm, Partitioning, Clara, Clarans. Advanced Hierarchical algorithms Decision Trees: Decision tree induction, Tree pruning, Extracting classification rules from decision trees, Decision tree construction algorithms, Decision tree construction with presorting.

UNIT V

Main Text Books :
Jiawei Han & micheline Kamber : “Data mining concepts and Techniques” 1st edition, first Indian reprint 2001, Harcourt India Private Limited, Isbn 1-55860489-8.

Reference Books :
E-5.1: WEB DEVELOPMENT USING OPEN SOURCE TECHNOLOGIES

Unit –1


Unit-2

Reading Data in Web Pages: Handling Text Fields, Text Areas, Check Boxes, Radio Button, List Boxes, Password Controls, Hidden Controls, Image Maps, File Upload, Buttons, PHP’s Server Variables, Using HTTP Headers, User’s Browser Type, Redirecting Browsers with HTTP Headers, Data Validation, Client-Side Validation, Object-Oriented Programming: Create Class, Create Objects, Setting Access to Properties and Methods, Inheritance, Overriding Methods, Overloading Methods, Auto loading Class, Creating Static Methods, Using Properties In Static Methods, Creating Interfaces, Comparing Objects, Creating Class Constants, Using the final Keyword, Cloning Objects, Reflection.

Unit-3

File Handling: Opening Files Using fopen, Reading Text from a File Using fgets, Closing a File, Reading from a File Character by Characters with fgetc, Reading a File into an Array with file, Checking if a File Exists with file _exists, Getting File Sizes, Reading Binary Reads with fread, Copying Files with copy, Deleting Files with unlink, Writing with fwrite, Reading and Writing Binary Files, Appending to Files with fwrite, Locking Files, XML: What is XML, XML document structure, PHP XML Functions. Sessions, Cookies: Setting a Cookie, Reading a Cookie, Setting Cookie’s Expiration, Deleting Cookies, Storing Data in Session, Sending e-mail

Unit-4

What is Open Source, Benefits of Open Source, What is My SQL?, Features of My SQL, Relationship Modeling (One to One, One to Many and Many to Many), Normalization (I, II and III), Data Types of My SQL, Creating, Dropping and Selecting a Database, Various Database Operations on Data, Querying Data, Joins and Indexes, Inbuilt Functions of My SQL, Security and Administration in My SQL.

Unit-5

Working with Database: Connecting to the Database Server, Reading the Table, Closing the Connection, Update Database, Insert new Data Item, Deleting Records, Creating New Database, Creating New Table, Working with FTP: Download Files with FTP, Upload Files with FTP, Deleting Files with FTP, Creating and Remove directory with FTP.

Text Books:

Reference Books:
UNIT I

Computer arithmetic: introduction, floating point representation of numbers, arithmetic operations with normalized floating point numbers, consequences of normalized floating point representation of numbers, numbers and their accuracy, errors and their computation, absolute, relative and percentage errors. Solution of algebraic and transcendental equations: Bisection method, method of false position, Newton – Raphson method, secant method, role of convergence of the iterative methods, comparison of iterative methods.

UNIT II


UNIT III


UNIT IV

Least squares approximation of functions – linear regression, polynomial regression, fitting exponential and trigonometric functions. Measure of central tendency: introduction, arithmetic mean; properties, merits and demerits, median of arithmetic mean, mode and its merits and demerits.

UNIT V

Measure of dispersion: introduction, range, coefficient of range, quartiles, quartile deviation, coefficient of quartile duration, mean deviation and coefficient of mean deviation, standard deviation, variance of all types of distribution, coefficient of dispersion, coefficient of variation.

Suggested Readings:
3. Computer Oriented Numerical Method - V. Rajaraman

Reference Books:
1. Introductory methods of numerical analysis - S. S. Shastri
E-5.3: SOFTWARE TESTING AND QUALITY MANAGEMENT

UNIT I
Software quality, SQA management and models.

UNIT II
Direct reporting and removal.

UNIT III
Software reliability models, software quality metrics.

UNIT IV
Quality assurance models, Risk management.

UNIT V
Data collection and maintenance, setting up and evaluation of quality programs. Suggested Books:
E-5.4: MULTIMEDIA TOOLS AND VIRTUAL REALITY

UNIT I

UNIT II

UNIT III
Object Oriented Multimedia: Object, Classes and related items – Multimedia Frameworks: Overview - Media classes - Transform classes format classes - component classes

UNIT IV

UNIT V

Text Books:
1. Multimedia in Practical Technology and Application by Judith Jeffcoate, PHI.

Reference Books:
E-5.5: HUMAN COMPUTER INTERACTION

UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V

Text Book

Reference Book
E-5.6: DIGITAL IMAGE PROCESSING

UNIT I


UNIT II


UNIT III


UNIT IV


UNIT V


Suggested Reading:
E-6.1: OPTIMIZATION TECHNIQUES

Unit I
An Overview of OR: Meaning, Scope and Limitation of OR. Mathematical Model building. Linear Programming: Assumption of Linear Programming, Primal and Dual Problem, Problem formulation, LPP through graphical method. The algebra of simplex method and computational aspects of the simplex algorithm. Transportation Problem: Solution by MODI method and it structure. Other applications of linear programming in computer application.

Unit-II

Unit-III
Criterion of maximum, min maximin and minmax. Network Analysis: Project Management applications of PERT and CPM, Diagrammatic representation, critical path calculations by network analysis and CPM method, determinations of floats, Shortest route problem.

Unit-IV
Replacement and Maintenance Models: replacement of items that deteriorate when money value is not counted and counted, group replacements, deteriorates with time. Markov chains models: Introduction to discrete time Markov chains: Chapman Kolmogorov equations. Introduction to continuous time markov chains: Examples of pure birth and pure death Processes.

Unit V

Main Text Books:

Reference Books:
E-6.2: DISTRIBUTED SYSTEM

UNIT I


UNIT II


UNIT III

Name Services: Name services and domain name systems, Directory and discovery services, The Global name service, X. 500 directory service. Security Overview of security techniques, Cryptographic algorithms, digital signature, Cryptographic pragmatics. Distributed Algorithms Distributed algorithm design principles and issues such as coordinator, agreement. Examine source of difficulties such as timing, interaction models and Failures.

UNIT IV


UNIT V

Distributed Multimedia System: Characteristics of multimedia data, Quality of Service management, Resource management, Stream Adaptation. Distributed Shared Memory Design and implementation issues, Sequential consistency and Ivy, Release consistency and Munin and other consistency models.

Suggested Readings:

UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V
Enterprise Management: - Enterprise Management System, Enterprise Resource Planning (ERP) System, Benefits of ERP, ERP Product Evaluation, Supply Chain Management (SCM), Information Management in SCM, Customer Relationship Management (CRM)

Main Text Books:
1. W S Jawadekar:"Management Information System", TMH
2. Robert G Murdick, Loel E Ross, James R C: "Information System for Modern Management", PHI

Reference Books:
1. O Brian: Management Information System", TMH
E-6.4: BIO-INFORMATICS

UNIT 1
Introduction to Bio-Informatics: definition, major databases in bio-informatics, molecular biology, central dogma, data retrieval tools, data mining of databases, gene analysis, Prokaryotic and Eukaryotic genomes, sequence assembly, gene mapping, physical maps, ORF, amino acids, DNA, RNA sequences, genetic code.

UNIT 2
DNA and Protein Sequences: working with single DNA sequence, removing vector sequences, verifying restriction maps, PCR design, GC content, counting words, internal repeats, protein coding regions, ORFing, genomescan protein, predicting properties, primary structure analysis, transmembrane segments, PROSITE patterns, interpreting scanprosite results, finding domains, CD server resultd, pfscan results.

UNIT 3
Alignment of Pair of Sequences: terminology, global and local alignment, dot matrix, dynamic programming, using scoring matrices, PAM matrices, BLOSUM. Working with FASTA – algorithm, output, E-values, Histogram. Working with BLAST – algorithm, output, services, gapped BLAST – PSIBLAST, comparison of FASTA and BLAST.

UNIT 4
Multiple Sequence Alignment: Criteria for multiple sequence alignment, applications, choosing the right sequences, FASTA, ClustalW, TCoffee methods, interpreting multiple sequence alignment, getting in right format, converting formats, using Jalview, preparing for publishing.

UNIT 5
Protein Classification & Structure Prediction: structure of amino acids, primary structure, secondary structure, folds and motifs, alpha and beta helix, structure based protein classification, protein structure databases, folding problem, PROPSEARCH, primary and secondary structure analysis and prediction, motifs, profiles, patterns and finger prints.

Text Books:
1. BioInformatics: Methods and Application – S C Rastogi, PHI
2. bio Informatics – A beginner guide – J m Clevere & Cadrienotredom, Wiley DreamTech

Reference Books:
1. Introduction to Bio Informatics – T K Attwood & D J Perry Smith – Pearson Education
2. Fundamental Concepts of bioInformatics – D E Krane & M L Raymer, Pearson Education
UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V

Main Text Books :

Reference Books :

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E-6.6: SOFT COMPUTING

UNIT 1
Learning and soft computing: examples of applications in diverse fields, basic tools of soft computing, basic mathematics of soft computing, learning and statistical approaches to regression and classification. Single layer networks: the perceptron, adaline and the least mean square algorithm. Multilayer perceptrons: the error backpropagation algorithm, the generalized delta rule, heuristics or practical aspects of the error backpropogation algorithm.

UNIT 2
Radial basis function network: ill posed problems and regularization technique, stabilizers and basis functions, generalized radial basis function networks, moving centers learning, regularization with non-radial basis functions, orthogonal least squares, optimal subset selection by linear programming.

UNIT 3

UNIT 4
Evolutionary algorithms: difficulties with classical optimization algorithms, genetic algorithms, evolution strategies, evolutionary programming, genetic programming, multi-model function optimization, Crowding Model, Sharing Function Model.

UNIT 5

Text Books:
1. Learning and Soft Computing       Vojislav Kecman, Pearson Education
2. Multi-Objective Optimization using Evolutionary Algorithms, Kalyanmoy Deb, WSE Willey

Reference Books:
1. Artificial Neural Networks       Robert J Schalkoff, McGraww Hill
E-7: Data Warehousing and Mining LAB
Practical based on theory paper, mini project handling the small database.

E-8: Server Administration LAB
Practical based on theory paper, mini project handling the small database.

E-9: Elective I LAB
Practical based on theory paper, mini project handling the small database.