**Syllabus of (M. Phil Computer Science) DDE, BRABU, Muzaffarpur**

**SEMESTER – I (M. Phil)**

<table>
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<tr>
<th>Sr.</th>
<th>SUBJECT CODE</th>
<th>NAME OF THE SUBJECT</th>
<th>Teaching Scheme</th>
<th>Examination Scheme</th>
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<td>Research Methodologies for Quality, relevant and consistent research</td>
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<td>MPCS-02</td>
<td>Data Warehousing and Data Mining</td>
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<td>MPCS-03</td>
<td>Web Technologies and Services</td>
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**SEMESTER – II (M. Phil)**

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**Elective I**

(A) Software Technologies  
(B) Knowledge Management Techniques  
(C) Digital Image Processing and Multimedia Systems

**Elective II**

(A) Advanced Networking and Security Systems  
(B) Data Structures and Algorithms  
(C) Advanced Computer Techniques
SEMESTER-I

Paper 1 (MPCS- 01) Research Methodology

Course Content:

UNIT - I


UNIT – II


UNIT – III


UNIT – IV


UNIT – V


Reference Books

1. Statistical Methods - S.P. Gupta
Paper 2 ( MPCS- 02 ) Data Warehousing and Data Mining
Course Content:

UNIT - I

Fundamentals of data mining: Data mining Functionalities, Classification of Data Mining Systems, Major issues in Data Mining, Data Warehouse and OLAP Technology for Data mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse implementation, Development of Data Cube Technology.

UNIT - II

Data Preprocessing, Data Mining Primitives, Languages, and System Architectures: Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation. Data Mining Primitives, Data Mining Query Languages, Designing Graphical User Interfaces Based on Data Mining Query Language Architectures of Data Mining Systems.

UNIT - III

Concepts Description and Mining Association Rules: Characterization and Comparison, Data Generation and Summarization, Bases characterization, Analytical Characterization: Mining Class Comparisons, Association Rule Mining, Rules from Relational Databases and Data Warehouses.

UNIT – IV

Classification, Prediction and Cluster Analysis Introduction: Issues Regarding Classification and Prediction, Classification by Decision Tree, Classification by Back propagation, Classification Based on Concepts from Association Rule Mining, Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density Based Methods, Grid Based Methods, Model – Based Clustering Methods, outlier analysis, Multidimensional Analysis and Descriptive

UNIT – V
**Mining Complex Types of Data:** Mining of Complex, Data Objects, Mining Spatial Databases, Mining Multimedia Databases, Mining Time – Series and Sequence Data, Mining Text Databases, Mining the World Wide Web.

**REFERENCE:**
2. Data Ming Techniques – Arjun K Pujari, Universities Press.

**Paper 3 (MPCS- 03 ) Web Technologies and Services**

**Course Content:**

**UNIT – I**

**HTML ,DHTML and Scripting Language:** Common tags – HTML Tables and formatting internal, linking – Complex HTML forms, Java Scripts – Control structures, DHTML – CSS – event model – filters & transitions.

**UNIT – II**

**Applets and AWT Programming:** Review of Applets, Class, Event Handling, AWT Programming, Introduction to Swing: Japplet, Handling Swing Controls, Tables, Differences between AWT Controls & Swing Controls, Developing a Home page using Applets & Swing, Multi-Threading and RMI.

**UNIT – III**


**UNIT – IV**

**JSP:** Introduction to JSP: The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC. Tomcat Server & Testing Tomcat, JSP Application Deployment.

**UNIT – IV**

**JDBC:** Database Access, Database Programming using JDBC, Studying javax.sql.* package, Accessing a Database from a JSP Page.
REFERENCE:
- Internet and World Wide Web – How to program by Dietel, and Nieto Pearson Education Asia. (Chapters: 3,4,8,9,10,11,12-18).
- Java Server Pages by Hans Bergstan. (Chapters: 1-9).

SEMESTER-II

ELECTIVE I

(A) SOFTWARE TECHNOLOGIES

Course Content:

UNIT – I

Software Management Concept: Software process, Software project Metrics, Software project Planning, Risk Management.

UNIT – II


UNIT – III


UNIT – IV

Enterprise Application Integration: Concepts and challenges of integrating different application, Different heterogeneous platform, EAI architecture, EAI approaches data level, Application / process level, method level.

UNIT – V
Messaging concepts and services: Messaging concepts and various types of messaging services, Middleware and adapter services, Transaction middle aware, EAI process methodology

REFERENCES:


(B.) Knowledge Management Techniques

Course Content:

UNIT – I

Overview of KM: Scope and significance, techniques, difficulties (Road Map), implementation, KM and sharing, types of KM, Principles, dynamics.

UNIT – II

Drivers of KM: Pillars of KM, Seven Layers, critical success factors.

UNIT – III

Essence of information technology: Knowledge Economy, context, Association of KM with e-comm, customer relationship management, total quality management, benchmarking and reassurance of KM.

UNIT – IV

KM implementation strategies: Digital dash board, Web storage system, wireless solutions, intelligent interfaces.

UNIT – V

Case Studies

A study and development of minimum one KM initiatives of different organizations for problem solving, conflict resolution and facing turbulence through KM.

REFERENCE:

• Knowledge Management [Tools for business development] by Dr. B. Rathan Reddy; himalaya publishing house.
• Knowledge Management Strategies, by Jerry Honeycutt; Prentice-Hall of India.
(C.) Digital Image Processing and Multimedia Systems

Course Content:

UNIT – I


UNIT – II

Image Enhancement and Image filtering: enhancement by point processing, histogram processing, spatial filtering and enhancement in frequency domain, color image processing, Image filtering and restoration: Algebraic approach to restoration, inverse, filtering, least mean squares and interactive restoration, geometric transformations.

UNIT – III


UNIT – IV

Multimedia System: Project design: setting up, requirements, navigation, storage, delivery, Authoring tools: history, comparison of different approaches, functionality and Principles, Case study: Adobe Flash - Applications (eg. kiosks, distance learning, webbased).

UNIT – V

Auditory input and output: Auditory input and output: standards and techniques - Quality of service and usability in sound.
REFERENCE:
• A.K.JAIN, “Fundamental of Digital Image Processing” PHI
• C.GONZALEX & R.E WOODS “Digital Image Processing” Addison Wesley
• Multimedia magic by S Gokul

ELECTIVE II

(A) Advanced Networks

Course Content:

UNIT – I

Network Tools and Techniques: Protocol layering, system design, multiple access, switching, scheduling, naming, addressing, routing, error control; flow control, Traffic management – data link layer protocols, Internet: concept, history, network layer, transport protocol UDP, TCP, Ipv4, Ipv6

UNIT – II

Local Area Networks, Socket and Interprocess communication: Topologies, access techniques, LAN, 802.11G wireless LANs, Application layer: DNS, Email, WWW, multimedia, TCP sockets, UDP sockets name and address conversion, IPv4 / Ipv6 interoperability - Socket programming, Posix IPC, system V IPC, Pipes, FIFO, Posix message queen, System V semaphore, RPC in Sun systems. Unix programming using IPe.

UNIT – III


UNIT – IV

UNIT – V


REFERENCE:
• Cryptography and Network Security Third Edition William Stallings
• Cryptography and Data Security Demming, D, Addison Wesley, 1982.

(B) DATA STRUCTURES AND ALGORITHMS

Course Content:

UNIT – I

Trees: Operations on binary trees - tree search and insertion - tree deletion - Analysis of tree search and insertion - balanced tree insertion - balanced tree deletion - optimal search trees.

UNIT – II

Multi way trees and hashing: B - trees - binary B - trees - choice of a transformation function - collision handling – analysis of key transformation.

UNIT – III
**Greedy Methods:** The general method - Knapsack problem - job sequencing with deadlines - minimum cost spanning tree - Optimal storage on tapes - optimal merge patterns.

**UNIT – IV**

**Dynamic Programming:** The general method - All - pairs shortest paths - single source shortest paths - optimal binary search trees - The traveling salesman problem - Flow shop scheduling

**UNIT – V**

**Back tracking:** The general method - the 8 - queen problem - sum of subsets - graph coloring – Hamiltonian cycles.

**REFERENCE:**

(C) Advanced Computer Techniques

**Course Content:**

**UNIT – I**

**Theory of Programming Languages:** Programming Language : Introduction, Characteristics, Uses, Programming Language Processor, Hierarchies of Computers, Data, Elementary data types, Structured data types, expression, statements, procedures, functions, data control and storage management, data abstraction, exception handling, data encapsulation, theoretical models. The above features in C, C++, JAVA.

**UNIT – II**
**Software Engineering:** Introduction to Software Engineering, Software Project Planning, Requirement analysis specification, Software Design, Implementation issues, Software Testing, Verification and Validation, Software maintenance and Reliability.

**UNIT – III**

**Compiler Design:** Introduction, Lexical analysis, syntax analysis, types, storage organization, storage allocation, parameter passing, symbol table, language facilities for dynamic storage, allocation, dynamic storage allocation techniques, Intermediate code generation, code generation, code optimization.

**Unit – IV - Artificial Intelligence and Expert Systems**


**Unit – V - Neural Networks**


**REFERENCE:**


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