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| SRI RAMAKRISHNA P.G. (AUTONOMOUS) COLLEGE :: NANDYAL |
| DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS |
| DETAILED SYLLABUS FOR MCA - III SEMESTER |
| (w.e.f. 2010-2011 Batch) |

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| --- | --- | --- | --- | --- | --- | --- |
| S.No. | Paper Code | Paper Title | Workload per Week in Hours (For 16 Weeks) | Maximum Marks | | |
| Internal Assessment | Semester End | Total |
| 1 | MCA3T1 | Data Mining | 4 | 25 | 75 | 100 |
| 2 | MCA3T2 | Optimization Techniques | 4 | 25 | 75 | 100 |
| 3 | MCA3T3 | Unix Network Programming | 4 | 25 | 75 | 100 |
| 4 | MCA3T4 | Web Technologies | 4 | 25 | 75 | 100 |
| 5 | MCA3T5 | Artificial Intelligence | 4 | 25 | 75 | 100 |
| 6 | MCA3P1 | Data Mining Lab | 4 | 25 | 75 | 100 |
| 8 | MCA3P2 | Web Technologies Lab | 4 | 25 | 75 | 100 |
|  | | | 32 | 175 | 525 | 700 |

MCA3T1: DATA MINING

**UNIT - 1**

Data Mining, Data Mining Functionalities classification - Data Mining Task Primitives - Integration of a Data Mining System with a Database - Major issues in Data Mining - Descriptive Data Summarization - Data Cleaning

**UNIT - 2**

Data Integration and transformation - Data reduction, Data Discretization - concept Hierarchy Generation.

**UNIT - 3**

What is Data Warehouse? - Multidimensional Data Model - Data Warehouse Architecture - Data Warehouse Implementation -From Data Warehouse to data mining.

**UNIT - 4**

Basic Concepts of frequent patterns - Frequent Item sets -mining methods - Association rules - what is classification and Prediction? - Classification By Decision Tree Induction - Bayesian Classification - Rule-Based Classification.

**UNIT - 5**

Cluster analysis - Types, Partitioning methods, Hierarchical methods, Density Based methods, Grid Based methods, and Model-Based Clustering methods, Outlier analysis

# TEXT BOOK:

Data Mining Concepts & Techniques By Jiawei Han, Micheline & Kamber (2nd Edi.) Morgan Kaufmann Publisher (Elsevier)

**REFERENCE BOOKS:**

1. Data Mining Introductory and advanced topics –Margaret H Dunham,  Pearson Education
2. Data Mining Techniques – ARUN K PUJARI, University Press.
3. Data Warehousing in the Real World – Sam Anahory & Dennis Murray. Pearson Education Asia.
4. The Data Warehouse Life cycle Tool kit – Ralph Kimball Wiley Student Edition
5. Data Warehousing by S Mohanthy (TMH)

###### MCA3T2: OPTIMIZATION TECHNIQUES

# UNIT – 1

Linear Programming Problem: Introduction – Mathematical Formulation of the Problem Linear Programming Problem Graphical Solution: Some Exceptional Cases – General Linear Programming Problem – Canonical and Standard Forms of LPP. Simplex Method**:** The Computational Procedure of Simplex Method, Big-M Method, Two-Phase method, and some simple problems.

Duality in Linear Programming: Formulating a Dual Problem – Primal – Dual Pair in Matrix Form – Duality and Simplex Method – Dual Simplex Method – Degeneracy and Some related problems

# UNIT – 2

Transportation Problem: Introduction – General Transportation Problem – The Transportation Table – Duality in Transportation Problem – Loops in Transportation Tables – LP Formulation of the Transportation Problem –Solution of a Transportation Problem – Finding an Initial Basic Feasible Solution – Testing for Optimality – Degeneracy in Transportation Problem – Transportation Algorithm (MODI Method), Unbalanced Transportation Problem.

Assignment Problem: Introduction – Mathematical Formulation of the Problem – The Assignment Method – Special Cases in Assignment Problems – The Traveling Salesman Problem

# UNIT – 3

Sequencing Problem**:** Introduction – Problem of Sequencing – Basic Terms Used in Sequencing – Processing n Jobs through Two Machines - Processing n Jobs through K Machines - Processing 2 Jobs through K Machines

# UNIT – 4

Games and Strategies**:** Introduction – Two – Person Zero – Sum Games – Some Basic Terms – The Maximin – MiniMax Principle – Games without Saddle Points – Mixed Strategies – Graphic Solution of 2 X n and m X 2 Games – Dominance Property – Arithmetic Method For n X n Games – General Solution of m X n Rectangular Games

**UNIT – 5**

Network Scheduling by PERT / CPM: Introduction – Network and Basic Components – Rules of Network Construction – Critical Path Method, PERT, Probability Considerations in PERT, PERT Calculations – Distinction between PERT and CPM, Some Samples Problems

**TEXT BOOK:**

Operations Research by – Kranti Swarup, Gupta, Manmohan – Sultan Chand & Sons, New Delhi, 2003 (11th Edition)

**REFERENCE BOOKS:**

1. Introduction to Operations Research 7th Edition by Hillier/ Lieberman, TMH
2. Operations Research – S Kalavathy (Vikas Publications)

###### MCA3T3: UNIX NETWORK PROGRAMMING

**U N I T – 1**

UNDERSTANDING THE UNIX COMMAND**:** Locating Commands, Internal and External Commands, Command Structure, Flexibility of Command Usage

THE vi EDITOR**:** Vi editorBasics

THE SHELL:commands**,** Pattern Matching, Escaping and Quoting, Redirection, Pipes, Tee command, Command Substitution, Shell Variables.

**U N I T – 2**

PROCESS:Process Basics, System Processes, Mechanism of Process Creation, Internal and External Commands

CUSTOMIZING THE ENVIRONMENT:Environment Variables, Aliases, Command History, In-Line Command Editing

ESSENTIAL SHELL PROGRAMMING:Shell Scripts, Using Command Line Arguments, The Logical Operators, control statements

**U N I T – 3**

INTERPROCESS COMMUNICATION:Introduction,  File  and  Record Locking,  Simple  Client-Server  Pipes, FIFO's, Streams and Messages, Name Spaces, System V IPC, Message Queues, Semaphores, Shared Memory, Socket and TLI.

**U N I T – 4**

A NETWORK PRIMER:Communication Protocols: Introduction, TCP/IP, XNS, SNA, NetBIOS, OSI Protocol, UUCP, Protocols Comparisons.

**U N I T – 5**

BERKELEY SOCKETS:Introduction, Overview, Unix Domain Protocols, socket   Addresses, Elementary Socket System Calls, Simple Examples, Advanced Socket, System Calls,  Reserved Ports, Stream Pipes, Passing File  Descriptors,  Socket Options,  Asynchronous I/O, Input/Output Multiplexing, Out-of-Band  and Data, Sockets and Signals, Internet Superserver, Socket Implementation.

**TEXT BOOKS:**

1. Unix Network Programming By W Richard Stevens, PHI

# 2. Unix V.3 Concepts And Applications By    Sumitabha Das (Tata McGraw Hill)

**REFERENCE BOOK**:

1. Introduction to UNIX & SHELL Programming by M.G.Venkateshmurthy, Pearson Education

**MCA3T4: WEB TECHNOLOGIES**

**UNIT – 1**

# Introduction to XHTML –W3C XHTML Validation service – Headers – Linking – Images – Unordered Lists – Nested and Ordered Lists – Basic XHTML Tags – Intermediate XHTML Tables and Formatting – XHTML Forms – Internal Linking – Creating and Using Image maps – meta Elements – frameset element – Nested framesets.

Cascading Style Sheets – Inline Styles – Embedded Style Sheets – Conflicting Styles – Linking External Style Sheets – Positioning Elements – Element dimensions – Text flow and the Box Model – User Style Sheets

# UNIT - 2

# Java Script: Introduction to Scripting: – A Simple Program– Obtaining user input with prompt Dialogs –Adding integers, Arithmetic, decision making – Control statements

# Java Script: Functions – Programmer-Defined Functions – Function Definitions – Random Number Generation, examples – Scope Rules – JavaScript Global Functions – Recursion vs. Iteration - Java Script: Arrays – Declaring and Allocating Arrays – Reference Parameters – Passing Arrays to Functions – Sorting Arrays – Searching Arrays - Java Script: Objects:– Math Object, String Object , Date Object, Boolean, Number, document, window Object

# UNIT – 3

Dynamic HTML – Object Model and Collections: Introduction – Object Referencing –– Dynamic Styles – Dynamic Positioning – Using the frames Collection – navigator Object

# Event Model – Event Onclick, Event onload , Error Handling with onerror , Tracking the Mouse with Event onmousemove , Rollovers with onmouseover and onmouseout – Form Processing with onfocus and onblur , More Form Processing with onsubmit and onreset – Event Bubbling – More DHTML Events.

# Filters and Transitions – Flip filters: flipv and fliph – Transparency with the chroma Filter – Creating Image masks – Miscellaneous Image filters: invert, gray and xray – Adding shadows to Text – Creating Gradients with alpha – Making Text glow – Creating Motion with blur – Using the wave Filter – Advanced Filters: dropshadow and light – blendTrans Transitions – revealTrans Transitions

# UNIT - 4

XML : Introduction – Structuring Data – XML Namespaces Document Type Definitions ( DTDs) and schemas– XML vocabularies- Document Object Model – DOM methods – Simple API for XML - Extensible Stylesheet Language(XSL) – Simple Object Access Protocol(SOAP)

# UNIT - 5

Web Servers (IIS, Apache) :– HTTP request Types – System Architecture – Client side scripting vs Server Side Scripting - Microsoft Internet Information Server (IIS) – Apache Web Server – Requesting documents

VBScript- introduction, operators, data types and control structures- VBScript functions-Arrays – String manipulation – classes and object

**TEXT BOOK:**

DEITEL & DEITEL : *Internet & World Wide Web - How to Program*, Pearson Education -Third Edition

**REFERENCE BOOKS:**

1. Ivan Bayross : *HTML, DHTML , Java Script , Perl, CGI*, BPB Publications
2. Chris Bates: Web Programming Building Internet Applications, Second Edition, Wiley (2007)
3. P.Sebesta: Programming with World Wide Web, 4th Edition, Pearson Education.

###### MCA3T5: ARTIFICIAL INTELLIGENCE

#### UNIT - 1

Artificial Intelligence: The AI Problems, The Underlying Assumption, What is an AI Technique? Problem, Problem Spaces, and Search - Defining the Problem as a State Space Search - Production Systems - Problem Characteristics - Production System Characteristics - Issues in the Design of Search Programs.

Heuristic Search Techniques:Generate-and-Test - Hill Climbing - Best First Search, Problem Reduction, Constraint Satisfaction, Means-Ends Analysis.

**UNIT – 2**

Knowledge Representation Issues - Representations and Mappings - Approaches to Knowledge Representation - Issues in Knowledge Representation - The Frame Problem.

Using Predicate Logic -Representing Simple Facts in Logic - Resolution and Natural Deduction.

Representing Knowledge Using Rules -Procedural versus Declarative Knowledge - Logic Programming - Forward versus Backward Reasoning - Matching, Control Knowledge.

**UNIT – 3**

Symbolic Reasoning Under Uncertainty -Logics for Nonmonotonic Reasoning, Implementation Issues, Augmenting a Problem Solver, Implementation - Depth-First Search, Implementation: Breadth-First Search.

Fuzzy Logic. Weak Slot-And-Filler Structures - Semantic Net, Frames.

**UNIT – 4**

Strong Slot-And-Filler Structures -Conceptual Dependency, Scripts - Game Playing: Overview - The Minimax Search Procedure, Adding Alpha- Beta Cutoffs, Additional Refinements.

**UNIT – 5**

Expert Systems:Representing and Using Domain Knowledge, Expert System Shells, Explanation and Knowledge Acquisition.

**TEXT BOOK**:

Artificial Intelligence by Elaine Rich, Kevin Knight (TMH)

**REFERENCE BOOKS:**

1. Artificial Intelligence (3rd Edition) by Patrick Henry Winston, Pearson Education
2. Introduction to Artificial Intelligence and Expert Systems By Dan W. Patterson, PHI
3. Introduction to Artificial Intelligence by Eugene Charniak and Drew McDermott, Addison Wesley
4. Artificial Intelligence A Modern Approach by Stuart Russell and Peter Norvig, Pearson Education( 2nd Edn.)
5. Artificial Intelligence by George F Luger, Pearson Education ( 4th Edition)
6. Artificial Intelligence A Systems Approach by M.Tim Jones, Infinity Science Series
7. Artificial Intelligence by Christopher Thornton & Benedict du Boulay , New Age International Publishers