

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

ADVANCED DBMS

Subject Code

:

06CS751

□ □ □

IA Marks

:

25

No. of Lecture Hrs./ Week

:

04

Exam Hours

:

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

03

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT - 1

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

OVERVIEW OF STORAGE AND INDEXING, DISKS AND FILES: Data on external storage; File organizations and indexing; Index data structures; Comparison of file organizations; Indexes and performance tuning. Memory hierarchy; RAID; Disk space management; Buffer manager; Files of records; Page formats and record formats.

7 Hours

UNIT - 2

TREE STRUCTURED INDEXING: Intuition for tree indexes; Indexed sequential access method; B+ trees, Search, Insert, Delete, Duplicates, B+ trees in practice.

7 Hours

UNIT - 3

HASH-BASED INDEXING: Static hashing; Extendible hashing, Linear hashing, comparisons.

6 Hours

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

UNIT - 4

OVERVIEW OF QUERY EVALUATION, EXTERNAL SORTING: The system catalog; Introduction to operator evaluation; Algorithms for relational operations; Introduction to query optimization; Alternative plans: A motivating example; What a typical optimizer does. When does a DBMS sort data? A simple two-way merge sort; External merge sort

6 Hours

PART - B

UNIT - 5

EVALUATING RELATIONAL OPERATORS: The Selection operation; General selection conditions; The Projection operation; The Join operation; The Set operations; Aggregate operations; The impact of buffering

6 Hours

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

UNIT - 6

A TYPICAL RELATIONAL QUERY OPTIMIZER: Translating SQL queries in to Relational Algebra; Estimating the cost of a plan; Relational algebra equivalences; Enumeration of alternative plans; Nested sub-queries; Other approaches to query optimization.

7 Hours

UNIT - 7

PHYSICAL DATABASE DESIGN AND TUNING: Introduction; Guidelines for index selection, examples; Clustering and indexing; Indexes that enable index-only plans; Tools to assist in index selection; Overview of database tuning; Choices in tuning the conceptual schema; Choices in tuning queries and views; Impact of concurrency; DBMS benchmarking.

7 Hours

UNIT - 8

MORE RECENT APPLICATIONS: Mobile databases; Multimedia databases; Geographical Information Systems; Genome data management.

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

6 Hours

TEXT BOOKS:

1. **Database Management Systems** – Raghu Ramakrishnan and Johannes Gehrke, 3rd Edition, McGraw-Hill, 2003.
2. **Fundamentals of Database Systems** – Elmasri and Navathe, 5th Edition, Addison-Wesley, 2007. (Chapter 30)

REFERENCE BOOK:

1. **Database Systems** – Connolly and Begg, 3th Edition, Pearson Education, 2002.

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

DIGITAL SIGNAL PROCESSING

Subject Code

:

06CS752

□□□

IA Marks

:

25

No. of Lecture Hrs./ Week

:

04

Exam Hours

:

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

03

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT - 1

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

UNIT - 3

IMPLEMENTATION OF DISCRETE-TIME SYSTEMS – 1: Structures for the Realization of Discrete-Time Systems. Structures for FIR Systems: Direct-Form Structures, Cascade-Form Structures, Frequency-Sampling Structures, Lattice Structure. Structures for IIR Systems: Direct-Form Structures, Signal Flow Graphs and Transposed Structures, Cascade-Form Structures, Parallel-Form Structures, Lattice and Lattice-Ladder Structures for IIR Systems.

6 Hours

UNIT - 4

IMPLEMENTATION OF DISCRETE-TIME SYSTEMS – 2 : State-Space System Analysis and Structures: State-Space Descriptions of Systems Characterized by Difference Equations, Solution of the State-Space Equations, Relationships between Input-Output and State-Space Descriptions, State-Space Analysis in the Z-Domain, Additional State-Space Structures.

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

Representation of Numbers: Fixed-Point Representation of Numbers, Binary Floating-Point Representation of Numbers, Errors Resulting from Rounding and Truncation.

6 Hours

PART - B

UNIT - 5

IMPLEMENTATION OF DISCRETE-TIME SYSTEMS - 3: Quantization of Filter Coefficients: Analysis of Sensitivity to Quantization of Filter Coefficients, Quantization of Coefficients in FIR Filters. Round-Off Effects in Digital Filters: Limit-Cycle Oscillations in Recursive Systems, Scaling to Prevent Overflow, Statistical Characterization of Quantization effects in Fixed-Point Realizations of Digital Filters.

6 Hours

UNIT - 6

DESIGN OF DIGITAL FILTERS – 1: General Considerations: Causality and its Implications,

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

Characteristics of Practical Frequency-Selective Filters.

Design of FIR Filters: Symmetric And Antisymmetric FIR Filters, Design of Linear-Phase FIR Filters Using Windows, Design of Linear-Phase FIR Filters by the Frequency-Sampling Method, Design of Optimum Equiripple Linear-Phase FIR Filters, Design of FIR Differentiators, Design of Hilbert Transformers, Comparison of Design Methods for Linear-Phase FIR filters.

□□□ □□□□□□□□□□□□□□□□ **7 Hours**

UNIT - 7

DESIGN OF DIGITAL FILTERS – 2: Design of IIR Filters from Analog Filters: IIR Filter Design by Approximation of Derivatives, IIR Filter Design by Impulse Invariance, IIR Filter Design by the Bilinear Transformation, The Matched-Z Transformation, Characteristics of commonly used Analog Filters, Some examples of Digital Filters Designs based on the Bilinear Transformation.

6 Hours

UNIT - 8

DESIGN OF DIGITAL FILTERS – 3: Frequency Transformations: Frequency Transformations in the Analog Domain, Frequency Transformations in the Digital Domain. Design of Digital Filters based on Least-Squares method: Padé Approximations method, Least-Square design methods, FIR least-Squares Inverse (Wiener) Filters, Design of IIR Filters in the Frequency domain.

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

7 Hours

TEXT BOOK:

1. **Digital Signal Processing** – John G. Proakis and Dimitris G. Manolakis, 3rd Edition, Pearson Education, 2003.

REFERENCE BOOKS:

1. **Digital Signal Processing: System Analysis and Design** – Paulo S. R. Diniz, Eduardo A. B. da Silva and Sergio L. Netto, Cambridge University Press, 2002.
2. **Digital Signal Processing: A Computer Based Approach** – Sanjit K. Mitra, Tata McGraw-Hill, 2001.
3. **Digital Signal Processing** - Alan V. Oppenheim and Ronald W. Schaffer, Pearson Education, 2003.

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

JAVA AND J2EE

Subject Code

:

06CS753	□ □ □
---------	-------

IA Marks

:

25

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

No. of Lecture Hrs./ Week

:

04

Exam Hours

:

03

Total No. of Lecture Hrs.

:

52

Exam Marks

:

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

100

PART - A

UNIT - 1

INTRODUCTION TO JAVA: Java and Java applications; Java Development Kit (JDK); Java is interpreted, Byte Code, JVM; Object-oriented programming; Simple Java programs.

Data types and other tokens: Boolean variables, int, long, char, operators, arrays, white spaces, literals, assigning values; Creating and destroying objects; Access specifiers. Operators and Expressions: Arithmetic Operators, Bitwise operators, Relational operators, The Assignment Operator, The? Operator; Operator Precedence; Logical expression; Type casting; Strings

Control Statements: Selection statements, iteration statements, Jump Statements.

6 Hours

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

UNIT - 2

CLASSES, INHERITANCE, EXCEPTIONS, APPLET: Classes: Classes in Java; Declaring a class; Class name; Super classes; Constructors; Creating instances of class; Inner classes. Inheritance: Simple, multiple, and multilevel inheritance; Overriding, overloading. Exception handling : Exception handling in Java. The Applet Class: Two types of Applets; Applet basics; Applet Architecture; An Applet skeleton; Simple Applet display methods; Requesting repainting; Using the Status Window; The HTML APPLET tag; Passing parameters to Applets; `getDocumentbase()` and `getCodebase()`; `AppletContext` and `showDocument()`; The `AudioClip` Interface; The `AppletStub` Interface; Output to the Console.

6 Hours

UNIT - 3

MULTI THREADED PROGRAMMING, EVENT HANDLING: Multi Threaded Programming: What are threads? How to make the classes threadable; Extending threads; Implementing `Runnable`; Synchronization; Changing state of the thread; Bounded buffer problems, read-write problem, producer-consumer problems. Event Handling: Two event handling mechanisms; The delegation event model; Event classes; Sources of events; Event listener interfaces; Using the delegation event model; Adapter classes; Inner classes.

7 Hours

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

UNIT - 4

SWINGS: Swings: The origins of Swing; Two key Swing features; Components and Containers; The Swing Packages; A simple Swing Application; Create a Swing Applet; JLabel and ImageIcon; JTextField; The Swing Buttons; JTabbedPane; JScrollPane; JList; JComboBox; JTable.

7 Hours

PART - B

UNIT - 5

JAVA 2 ENTERPRISE EDITION OVERVIEW, DATABASE ACCESS: Overview of J2EE and J2SE. The Concept of JDBC; JDBC Driver Types; JDBC Packages; A Brief Overview of the JDBC process; Database Connection; Associating the JDBC/ODBC Bridge with the Database; Statement Objects; ResultSet; Transaction Processing; Metadata, Data types; Exceptions.

6 Hours

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

UNIT - 6

SERVLETS: Background; The Life Cycle of a Servlet; Using Tomcat for Servlet Development; A simple Servlet; The Servlet API; The Javax.servlet Package; Reading Servlet Parameter; The Javax.servlet.http package; Handling HTTP Requests and Responses; Using Cookies; Session Tracking.

7 Hours

UNIT - 7

JSP, RMI: Java Server Pages (JSP): JSP, JSP Tags, Tomcat, Request String, User Sessions, Cookies, Session Objects. Java Remote Method Invocation: Remote Method Invocation concept; Server side, Client side.

6 Hours

UNIT - 8

ENTERPRISE JAVA BEANS: Enterprise java Beans; Deployment Descriptors; Session Java Bean, Entity Java Bean; Message-Driven Bean; The JAR File.

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

7 Hours

TEXT BOOKS:

1. **Java - The Complete Reference** – Herbert Schildt, 7th Edition, Tata McGraw Hill, 2007.
2. **J2EE - The Complete Reference** – Jim Keogh, Tata McGraw Hill, 2007.

REFERENCE BOOKS:

1. **Introduction to JAVA Programming** – Y. Daniel Liang, 6th Edition, Pearson Education, 2007.
2. **The J2EE Tutorial** – Stephanie Bodoff et al, 2nd Edition, Pearson Education, 2004.

MULTIMEDIA COMPUTING

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

Subject Code

:

06CS754

□□□

IA Marks

:

25

No. of Lecture Hrs./ Week

:

04

Exam Hours

:

03

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT - 1

INTRODUCTION, MEDIA AND DATA STREAMS, AUDIO TECHNOLOGY: Multimedia Elements; Multimedia Applications; Multimedia Systems Architecture; Evolving Technologies for

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

Multimedia Systems; Defining Objects for Multimedia Systems; Multimedia Data Interface Standards; The need for Data Compression; Multimedia Databases.

Media: Perception Media, Representation Media, Presentation Media, Storage Media, Transmission Media, Information Exchange Media, Presentation Spaces & Values, and Presentation Dimensions; Key Properties of a Multimedia System: Discrete & Continuous Media, Independence Media, Computer Controlled Systems, Integration; Characterizing Data Streams: Asynchronous Transmission Mode, Synchronous Transmission Mode, Isochronous Transmission Mode; Characterizing Continuous Media Data Streams. Sound: Frequency, Amplitude, Sound Perception and Psychoacoustics; Audio Representation on Computers; Three Dimensional Sound Projection; Music and MIDI Standards; Speech Signals; Speech Output; Speech Input; Speech Transmission.

7 Hours

UNIT - 2

GRAPHICS AND IMAGES, VIDEO TECHNOLOGY, COMPUTER-BASED ANIMATION: Capturing Graphics and Images Computer Assisted Graphics and Image Processing; Reconstructing Images; Graphics and Image Output Options. Basics; Television Systems; Digitalization of Video Signals; Digital Television; Basic Concepts; Specification of Animations; Methods of Controlling Animation;

Display of Animation; Transmission of Animation; Virtual Reality Modeling Language.

7 Hours

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

UNIT - 3

DATA COMPRESSION - 1: Storage Space; Coding Requirements; Source, Entropy, and Hybrid Coding; Basic Compression Techniques; JPEG: Image Preparation, Lossy Sequential DCT-based Mode, Expanded Lossy DCT-based Mode, Lossless Mode, Hierarchical Mode.

6 Hours

UNIT - 4

DATA COMPRESSION - 2: H.261 (Px64) and H.263: Image Preparation, Coding Algorithms, Data Stream, H.263+ and H.263L; MPEG: Video Encoding, Audio Coding, Data Stream, MPEG-2, MPEG-4, MPEG-7; Fractal Compression.

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

6 Hours

PART - B

UNIT - 5

OPTICAL STORAGE MEDIA: History of Optical Storage; Basic Technology; Video Discs and Other WORMs; Compact Disc Digital Audio; Compact Disc Read Only Memory; CD-ROM Extended Architecture; Further CD-ROM-Based Developments; Compact Disc Recordable; Compact Disc Magneto-Optical; Compact Disc Read/Write; Digital Versatile Disc.

6 Hours

UNIT - 6

CONTENT ANALYSIS: Simple Vs. Complex Features; Analysis of Individual Images; Analysis of Image Sequences; Audio Analysis; Applications.

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

6 Hours

UNIT - 7

DATA AND FILE FORMAT STANDARDS: Rich-Text Format; TIFF File Format; Resource Interchange File Format (RIFF); MIDI File Format; JPEG DIB File Format for Still and Motion Images; AVI Indeo File Format; MPEG Standards; TWAIN.

7 Hours

UNIT - 8

MULTIMEDIA APPLICATION DESIGN: Multimedia Application Classes; Types of Multimedia Systems; Virtual Reality Design; Components of Multimedia Systems; Organizing Multimedia Databases; Application Workflow Design Issues; Distributed Application Design Issues.

7 Hours

TEXT BOOKS:

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

1. **Multimedia Fundamentals: Vol 1-Media Coding and Content Processing** – Ralf Steinmetz, Klara Narstedt, 2nd Edition, Pearson Education / PHI, 2003.
2. **Multimedia Systems Design** – Prabhat K. Andleigh, Kiran Thakrar, PHI, 2003.

REFERENCE BOOKS:

1. **Multimedia Communication Systems: – Techniques, Standards, and Networks** – K.R Rao, Zoran S. Bojkovic and Dragorad A. Milovanovic, Pearson Education, 2002.
2. **Multimedia information Networking** – Nalin K Sharad – PHI, 2002.

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

DATA MINING

Subject Code

:

06CS755

□ □ □

IA Marks

:

25

No. of Lecture Hrs./ Week

:

04

Exam Hours

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

:

03

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

UNIT - 1

INTRODUCTION, DATA – 1: What is Data Mining? Motivating Challenges; The origins of data mining; Data Mining Tasks. Types of Data; Data Quality.

6 Hours

UNIT - 2

DATA – 2: Data Preprocessing; Measures of Similarity and Dissimilarity

6 Hours

UNIT - 3

CLASSIFICATION: Preliminaries; General approach to solving a classification problem; Decision tree induction; Rule-based classifier; Nearest-neighbor classifier.

8 Hours

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

UNIT - 4

ASSOCIATION ANALYSIS - 1: Problem Definition; Frequent Itemset generation; Rule Generation; Compact representation of frequent itemsets; Alternative methods for generating frequent itemsets.

6 Hours

PART - B

UNIT - 5

ASSOCIATION ANALYSIS – 2 : FP-Growth algorithm, Evaluation of association patterns; Effect of skewed support distribution; Sequential patterns.

6 Hours

UNIT - 6

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

CLUSTER ANALYSIS: Overview, K-means, Agglomerative hierarchical clustering, DBSCAN, Overview of Cluster Evaluation.

7 Hours

UNIT - 7

FURTHER TOPICS IN DATA MINING: Multidimensional analysis and descriptive mining of complex data objects; Spatial data mining; Multimedia data mining; Text mining; Mining the WWW. Outlier analysis.

7 Hours

UNIT - 8

APPLICATIONS: Data mining applications; Data mining system products and research prototypes; Additional themes on Data mining; Social impact of Data mining; Trends in Data mining.

6 Hours

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

TEXT BOOKS:

1. **Introduction to Data Mining** – Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Pearson Education, 2007.

2. **Data Mining – Concepts and Techniques** – Jiawei Han and Micheline Kamber, 2nd Edition, Morgan Kaufmann, 2006.

REFERENCE BOOKS:

1. **Insight into Data Mining – Theory and Practice** – K.P.Soman, Shyam Diwakar, V.Ajay, PHI, 2006.

NEURAL NETWORKS

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

Subject Code

:

06CS756

□ □ □

IA Marks

:

25

No. of Lecture Hrs./ Week

:

04

Exam Hours

:

03

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

UNIT - 1

INTRODUCTION: What is a Neural Network?, Human Brain, Models of Neuron, Neural Networks viewed as directed graphs, Feedback, Network Architectures, Knowledge representation, Artificial Intelligence and Neural Networks.

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

7 Hours

UNIT - 2

LEARNING PROCESSES – 1: Introduction, Error-correction learning, Memory-based learning, Hebbian learning, Competitive learning, Boltzmann learning, Credit Assignment problem, Learning with a Teacher, Learning without a Teacher, Learning tasks, Memory, Adaptation.

6 Hours

UNIT - 3

LEARNING PROCESSES – 2, SINGLE LAYER PERCEPTRONS: Statistical nature of the learning process, Statistical learning theory, Approximately correct model of learning. Single Layer Perceptrons: Introduction, Adaptive filtering problem, Unconstrained optimization techniques, Linear least-squares filters

, Least-mean square algorithm, Learning curves, Learning rate annealing techniques, Perceptron, Perceptron convergence theorem, Relation between the Perceptron and Bayes classifier for a Gaussian

environment.

7 Hours

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

UNIT - 4

MULTILAYER PERCEPTRONS – 1: Introduction, Some preliminaries, Back-propagation Algorithm, Summary of back-propagation algorithm, XOR problem, Heuristics for making the back-propagation algorithm perform better, Output representation and decision rule, Computer experiment, Feature detection, Back-propagation and differentiation.

6 Hours

PART - B

UNIT - 5

MULTILAYER PERCEPTRONS – 2: Hessian matrix, Generalization, approximation of functions, Cross validation, Network pruning techniques, virtues and limitations of back-propagation learning, Accelerated convergence of back propagation learning, Supervised learning viewed as an optimization problem, Convolution networks.

7 Hours

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

UNIT - 6

RADIAL-BASIC FUNCTION NETWORKS – 1: Introduction, Cover's theorem on the separability of patterns, Interpolation problem, Supervised learning as an ill-posed Hypersurface reconstruction problem, Regularization theory, Regularization networks, Generalized radial-basis function networks, XOR problem, Estimation of the regularization parameter.

6 Hours

UNIT - 7

RADIAL-BASIC FUNCTION NETWORKS – 2, OPTIMIZATION - 1: Approximation properties of RBF networks, Comparison of RBF networks and multilayer Perceptrons, Kernel regression and its relation to RBF networks, Learning strategies, Computer experiment. Optimization using Hopfield networks: Traveling salesperson problem, Solving simultaneous linear equations,

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

Allocating documents to multiprocessors.

6 Hours

UNIT - 8

OPTIMIZATION METHODS – 2: Iterated gradient descent, Simulated Annealing, Random Search, Evolutionary computation- Evolutionary algorithms, Initialization, Termination criterion, Reproduction, Operators, Replacement, Schema theorem.

7 Hours

TEXT BOOKS:

1. **Neural Networks – A Comprehensive Foundation** - Simon Haykin, 2nd Edition, Pearson Education, 1999.
2. **Artificial Neural Networks** – Kishan Mehrotra, Chilkuri K. Mohan, Sanjay Ranka, Penram International Publishing, 1997.

Elective II

Written by Administrator
Sunday, 08 November 2009 09:35 -

REFERENCE BOOK:

1. **Artificial Neural Networks** – B. Yegnanarayana, PHI, 2001.