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

AD\	/Δ	NC	FD	DB	MS
$\neg$		10			$\mathbf{I}$

ADV	ANOLD DDING
	Subject Code
:	
Ŀ	
000	0754
	S751 000
IA M	arks
:	
25	
	I
No.	of Lecture Hrs./ Week
$\vdots$	
04	
Exa	m Hours
$\Box$	
:	

UNIT - 1

Written by Administrator Sunday, 08 November 2009 09:35 -
03
Total No. of Lecture Hrs.
52
Exam Marks
100
PART - A

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

OVERVIEW OF STORAGE AND INDEXING, DISKS AND FILES: Data on external storage;
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
<b>TREE STRUCTURED INDEXING:</b> 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

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

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.

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

6 Hours
TEXT BOOKS:
1. <b>Database Management Systems</b> – Raghu Ramakrishnan and Johannes Gehrke, 3 <sup>rd</sup> Edition, McGraw-Hill, 2003.
2. <b>Fundamentals of Database Systems</b> – Elmasri and Navathe, 5 <sup>th</sup> Edition, Addison-Wesley, 2007. (Chapter 30)
REFERENCE BOOK:
<ol> <li>Database Systems – Connolly and Begg, 3<sup>th</sup> Edition, Pearson Education, 2002.</li> </ol>

Written b	y Administrator	
Sunday,	08 November 2009	09:35 -

# **DIGITAL SIGNAL PROCESSING**

Subject Code
06CS752
25
No. of Lecture Hrs./ Week
04
Exam Hours

UNIT - 1

Written by Administrator Sunday, 08 November 2009 09:35 -	
03	
Total No. of Lecture Hrs.	
52	
Exam Marks	
100	
PART - A	

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

THE DISCRETE FOURIER TRANSFORM: ITS PROPERTIES AND APPLICATIONS: Frequen cy Domain Sampling: The Discrete Fourier Transform: Frequency Domain Sampling and Reconstruction of Discrete-Time Signals, The Discrete Fourier Transform (DFT), The DFT as a Linear Transformation, Relationship of the DFT to other Transforms. Properties of the DFT: Periodicity, Linearity and Symmetry Properties, Multiplication of Two DFT's and Circular Convolution, Additional DFT Properties; Linear Filtering Methods Based on the DFT: Use of the DFT in Linear Filtering, Filtering of Long Data Sequences; Frequency Analysis of Signals using the DFT.

### 7 Hours

### **UNIT - 2**

### EFFICIENT COMPUTATION OF THE DFT: FAST FOURIER TRANSFORM ALGORITHMS:

Efficient Computation of the DFT: FFT Algorithms: Direct Computation of the DFT, Divide-and-Conquer Approach to Computation of the DFT, Radix-2 FFT Algorithms, Radix-4 FFT Algorithms, Split-Radix FFT Algorithms, Implementation of FFT Algorithms.

**Applications of FFT Algorithms:** Efficient computation of the DFT of Two Real Sequences, Efficient computation of the DFT of a 2N-Point Real Sequence, Use of the FFT Algorithm in Linear filtering and Correlation. A Linear filtering approach to Computation of the DFT: The Goertzel Algorithm, The Chirp-Z Transform Algorithm. Quantization Effects in the Computation of the DFT: Quantization Errors in the Direct Computation of the DFT, Quantization Errors in FFT Algorithms.

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.

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 Sensuitivity to Quantizatior 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,

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

Characteristics of Practical Frequency-Selective Filters.

Design of FIR Filters: Symmetric And Antisymetric 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.

000 0000000000**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.

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

<b>7</b> 11		
7 Hours		

### **TEXT BOOK:**

1. **Digital Signal Processing** – John G. Proakis and Dimitris G. Manolakis, 3<sup>rd</sup> 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.Schafer, Pearson Education, 2003.

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

# **JAVA AND J2EE**

Subject Code

:

06CS753

IA Marks

:

25

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.

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

### **UNIT - 2**

**CLASSES, INHERITANCE, EXCEPTIONS, APPLETS:** 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(); ApletContext 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.

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 Imagelcon; 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.

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.

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

7	Н	O	11	rs

### **TEXT BOOKS:**

- 1. **Java The Complete Reference** Herbert Schildt, 7<sup>th</sup> 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, 6<sup>th</sup> Edition, Pearson Education, 2007.
  - 2. **The J2EE Tutorial** Stephanie Bodoff et al, 2<sup>nd</sup> Edition, Pearson Education, 2004.

## **MULTIMEDIA COMPUTING**

03

Written by Administrator Sunday, 08 November 2009 09:35 -		
Subject Code		
06CS754 000		
25		
No. of Lecture Hrs./ Week		
04		
Exam Hours		

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

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.

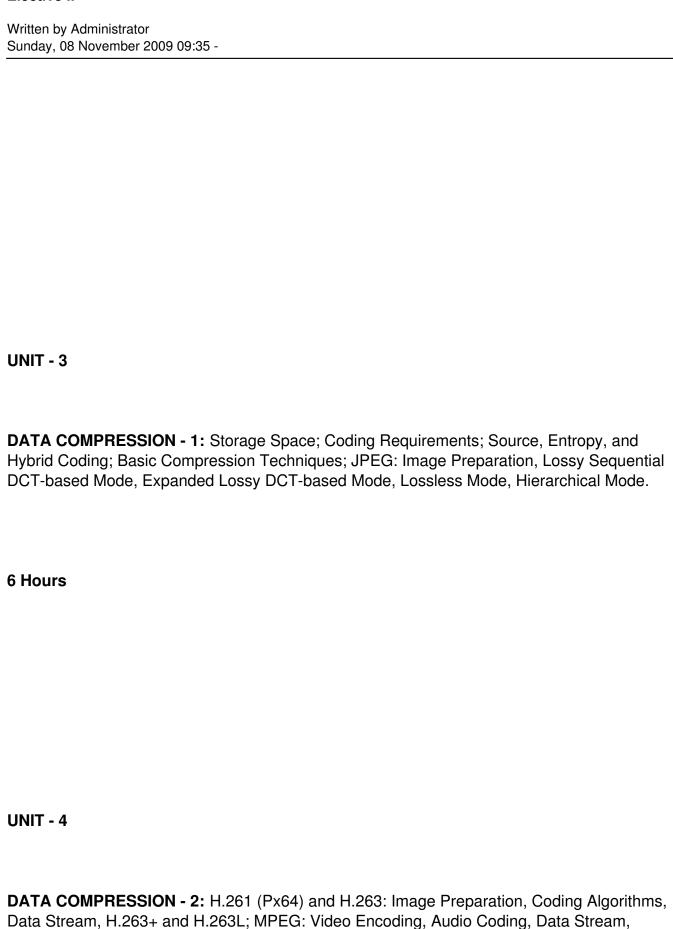
Media: Perception Media, Representation Media, Presentation Media, Storage Media, Transmission Media, Information Exchange Media, Presentation Spaces & Values, and Presentation Dimensions; Key Properties of a Multimedia System: Discrete & Continuous Media, Independence Media, Computer Controlled Systems, 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	ш	_		-
_	п	O	u	rs

### **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.



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
ONT - 5
<b>OPTICAL STORAGE MEDIA:</b> De Discourse de la Di
6 Hours
UNIT - 6
<b>CONTENT ANALYSIS:</b> Simple Vs. Complex Features; Analysis of Individual Images; Analysi

age Sequences; Audio Analysis; Applications.

25 / 40

lm

Written by Administrator Sunday, 08 November 2009 09:35 -
6 Hours
UNIT - 7
<b>DATA AND FILE FORMAT STANDARDS:</b> 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
<b>MULTIMEDIA APPLICATION DESIGN:</b> 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:

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

<ol> <li>Multimedia Fundamentals: Vol 1-Media Coding and Content Processing – Ralf Steinmetz, Klara Narstedt, 2 nd</li> <li>Edition, Pearson Education / PHI, 2003.</li> </ol>
2. <b>Multimedia Systems Design</b> – Prabhat K. Andleigh, Kiran Thakrar, PHI, 2003.
REFERENCE BOOKS:
<ol> <li>Multimedia Communication Systems: – Techniques, Standards, and Networks – K.R Rao, Zoran S. Bojkovic and Dragorad A. Milovanovic, Pearson Education, 2002.</li> </ol>
2. <b>Multimedia information Networking</b> – Nalin K Sharad – PHI, 2002.

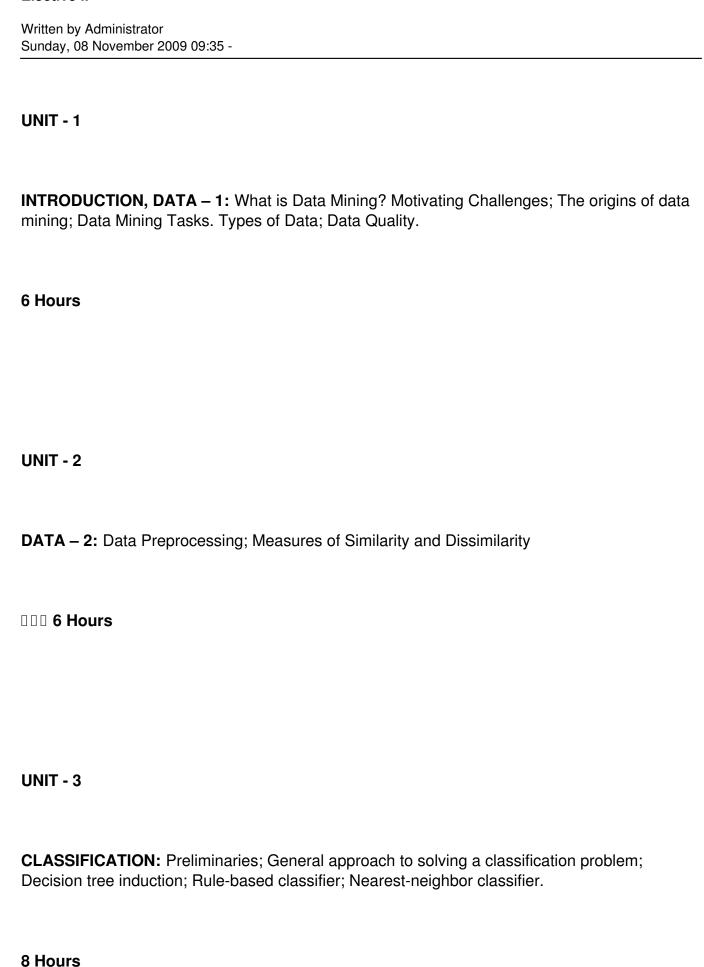
Exam Hours

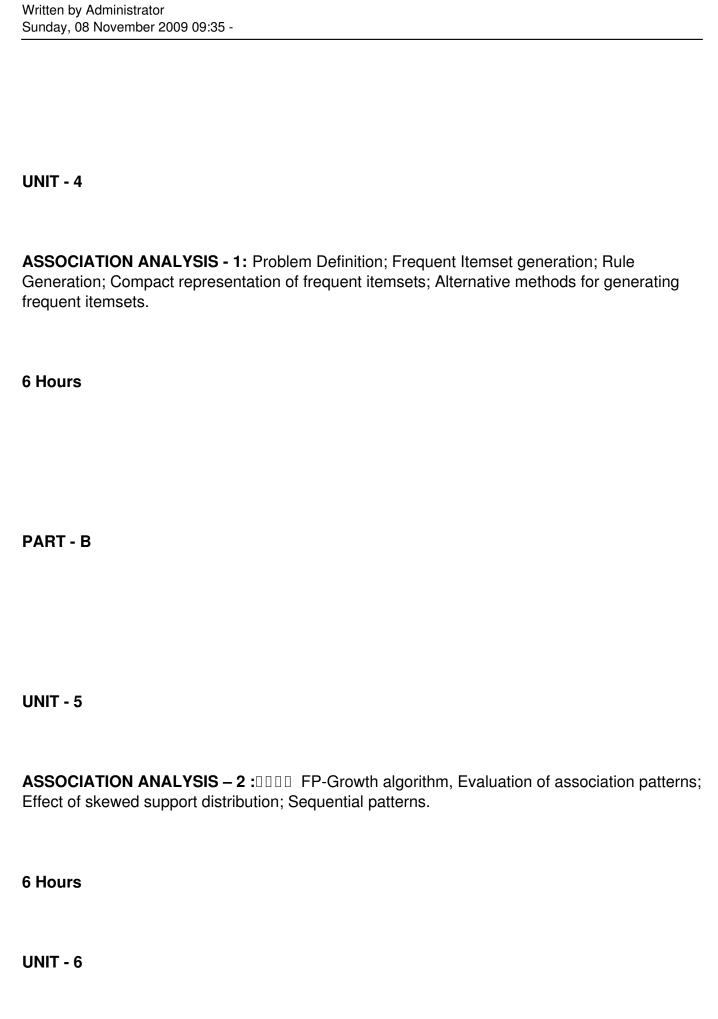
lective II	
ritten by Administrator unday, 08 November 2009 09:35 -	
ATA MINING	
ATA MINING	

DATA MINING		
Subject Code		
06CS755 000		
IA Marks		
25		
No. of Lecture Hrs./ Week		
04		

PART - A

Written by Administrator Sunday, 08 November 2009 09:35 -	
03	
Total No. of Lecture Hrs.	
52	
Exam Marks	
100	





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

<b>CLUSTER ANALYSIS:</b>                       Overview, K-means, Agglomerative hierarchical clustering, DBSCAN, Overview of Cluster Evaluation.
00000000000000000000000000000000000000
UNIT - 7
<b>FURTHER TOPICS IN DATA MINING:</b> 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
<b>APPLICATIONS:</b> 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

Written b	y Administrator	
Sunday,	08 November 2009	09:35

### **TEXT BOOKS:**

- 1. **Introduction to Data Mining** Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Pe arson Education, 2007.
- 2. **Data Mining Concepts and Techniques** Jiawei Han and Micheline Kamber, 2 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**

Written by Administrator Sunday, 08 November 2009 09:35 -
Subject Code
06CS756
IA Marks
25
No. of Lecture Hrs./ Week
04
Exam Hours
03

# Written by Administrator Sunday, 08 November 2009 09:35 Total No. of Lecture Hrs.

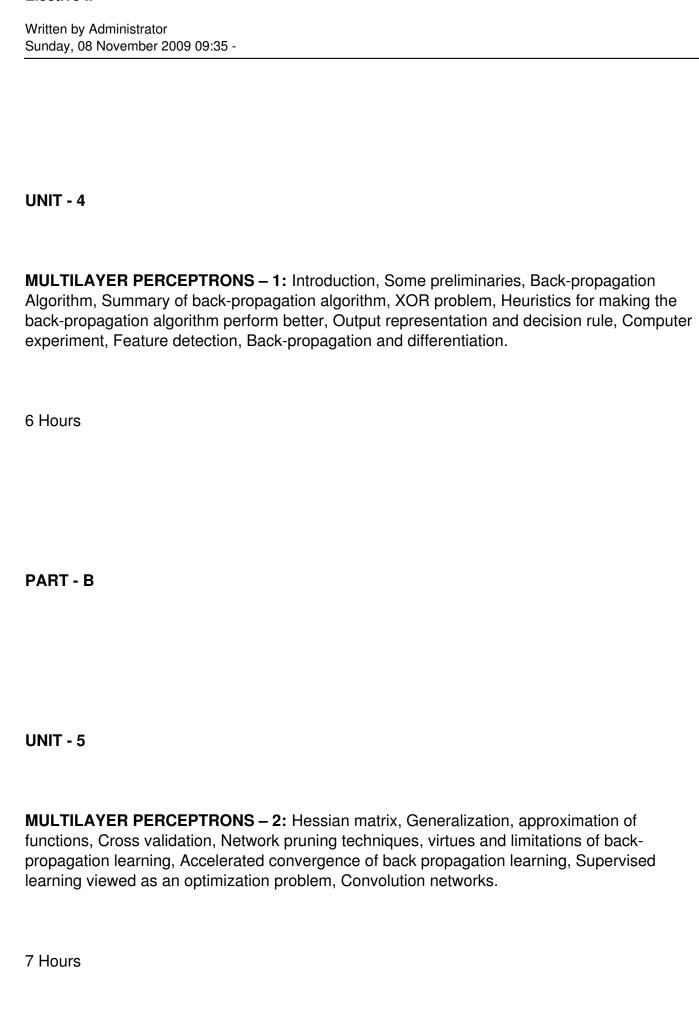
 $\Box$ 52 Exam Marks  $\Box$ 100 **PART - A** 

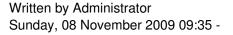
**UNIT - 1** 

**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.

7 Hours

Written by Administrator Sunday, 08 November 2009 09:35 -7 Hours **UNIT - 2** Memory-based learning, Hebbian learning, Competitive learning, Boltzamann 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.





### **UNIT - 6**

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 it's relation to RBF networks, Learning strategies, Computer experiment. Optimization using Hopfield networks: Traveling salesperson problem, Solving simultaneous linear equations,

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

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

# **REFERENCE BOOK:**

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