GITAM UNIVERISTY

(Estd. U/S 3 of UGC Act 1956)

M.Phil / Pre-Ph.D Syllabus

(w.e.f. 2012-13)

DEPARTMENT OF COMPUTER SCIENCE
GITAM INSTITUTE OF SCIENCE
GITAM UNIVERSITY
Gandhi Nagar Campus, Rushikonda
Visakhapatnam-530 045, A.P., India
Website: www.gitam.edu

Paper-I Research Advances in Computer Science - 100 Marks

Paper-II Research Methodology and Trends in Computer Science - 100 Marks

Paper-III Seminar and Viva-Voce - 100 Marks

Total : 300 Marks

Paper-I Research Advances in Computer Science

Aim and Objective: This course is aimed at developing scholars into mature researchers and to make original scientific contributions.

UNIT – I

Introduction to Data Mining, Data Mining Functionalities, Interestingness of a pattern, Classification of Data Mining Systems, Data Warehouse and OLAP Technology for Data Mining, Data Preprocessing, Languages and System Architectures, Concept Description, Characterization and Comparison . Mining Association Rules in large Databases , Association Mining functionality, Clustering and Prediction

UNIT - II

Introduction to Cryptography, Security goals, Attacks, Services and Mechanism, Techniques, Traditional Symmetric Key Ciphers , Modern Symmetric-Key Ciphers, Modern Block Ciphers, Modern Stream Ciphers, Data Encryption Standard (DES) , Advanced Encryption Standard (AES) Introduction to asymmetric-Key Cryptography, RSA Cryptosystem, Rabin Cryptosystem, Elgamal Cryptosystem, Elliptic Curve Cryptosystems,

UNIT-III

Cryptographic Hash Functions, MD4, MD5, WHIRLPOOL, SHA, Digital Signature, Symmetric-Key Distribution, KERBEROS, Symmetric Key Agreement, Public Key Distribution. E-MAIL, PGP and S/MIME. SSL and TLS, SSL Architecture, Protocols, SSL Message Formats, IP Sec, IKE

UNIT – IV

Introduction to Neuro – Fuzzy and Soft Computing, Fuzzy Sets,Set-theoretic Operations, Member Function Formulation and Parameterization,Fuzzy Rules and Fuzzy Reasoning, Extension Principle and Fuzzy Relations, Fuzzy If-Then Rules, Fuzzy Reasoning, Fuzzy Inference Systems,Mamdani Fuzzy Models, Sugeno Fuzzy Models, Tsukamoto Fuzzy Models, Input Space Partitioning and Fuzzy Modeling.

UNIT – V

Neuro Fuzzy Modeling, Adaptive Neuro-Fuzzy Inference Systems, Architecture, Hybrid Learning Algorithm,Learning Methods that Cross-fertilize ANFIS and RBFN, Coactive Neuro FuzzyModeling, Framework Neuron Functions for Adaptive Networks, Neuro Fuzzy Spectrum. Neural Networks, Supervised Learning Neural Networks,Perceptrons, Adaline, Backpropagation Mutilayer Perceptrons, Radial Basis Function Networks, Unsupervised Learning Neural Networks, Competitive Learning Networks, Kohonen Self-Organizing Networks , Learning Vector Quantization, HebbianLearning.

Text Books:

UNIT – I

1. Data Mining Concepts and Techniques, Jiawei Han and Micheline Kamber, Morgan Kaufman Publications.
2. Introduction to Data Mining, Adriaan, Addison Wesley Publication
3. Data Mining Techniques, A.K.Pujari, University Press

UNIT – II & III

1. Cryptography and Network Security, by Behrouz A. Forouzan, Tata McGraw-Hill, New Delhi.

Reference Books:

1. Network Security : Private Communication in a Public World, Kaufman, Pearson Education Asia, New Delhi
2. Cryptography and Network Security, By William Stallings Pearson Education, Asia, New Delhi.

UNIIT IV & V

1. Neuro-Fuzzy and Soft Computing, J.S.R.Jang, C.T.Sun and E.Mizutani, PHI, 2004, Pearson Education 2004.
2. Fuzzy Logic with Engineering Applications, Timothy J.Ross, McGraw-Hill, 1997.
3. Neural Networks, Fuzzy Logic and Genetic Algorithms, S. Rajasekaran and G.A.V.Pai PHI, 2003.

Paper-II Research Methodology and Trends in Computer Science

Aim and Objective: To introduce the scholars about various research methods, report writing and an overview of the concepts of Algorithms, Database Architecture, Client/Server Technology and Web technology.

UNIT – I

Research Methods: Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, Significance of Research, research Methods versus Methodology, Research and Scientific Method, Importance of Knowing How Research is done, Research Process, Criteria of good Research, Necessity of Defining the Problem, Technique involved in Defining the Problem, Meaning of Research Design, Need for Research Design, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs.

UNIT – II

Data collection and Report writing: Collection of primary data, Observation method, Interview Method, Collection of data through questionnaires, Collection of Data through Schedules, Collection of Secondary data, Selection of appropriate method for Data collection, Processing and Analysis of Data, processing operations, statistics in research, Significance of Report Writing, Different Steps in writing Report, Layout of the Research Report, Types of Reports, Oral Presentation, Mechanics of Writing a research Report , Precautions for Writing Research Reports.

UNIT – III

Algorithms and Analysis: Elementary data Structures, Greedy method: Knapsack problem, job sequencing with Deadlines, optimal merge patterns, Dynamic Programming: Multistage graphs Optimal binary search trees, 0/1 knapsack, Reliability design, The traveling salesperson problem, Flow shop scheduling, Basic search and traversal techniques: Code Optimization, Biconnected components and depth first search. Backtracking: The 8 – Queens problem, Sum of subsets, Hamiltonian cycles, Knapsack problem.

UNIT – IV

Database System Architectures and Distributed Databases: Centralized and Client-Server Architectures, Server System Architectures, Parallel Systems, Distributed Systems Network types.
Distributed Databases: Homogeneous and heterogeneous databases, Distributed data storage, Distributed transaction, Commit protocol, Concurrency control in Distributed databases, Availability, Distributed Query Processing, Heterogeneous distributed data bases, Directory Systems .

UNIT – V

CLIENT/SERVER TECHNOLOGY & ADAPTIVE WEB TECHNOLOGY: Distributed Objects and components , From Distributed Objects to components , 3 Tier Client Server, Object Style.
J2EE: Overview, Multi – tier Architecture, The Enterprise Application, Clients, Sessions management, Web Tier, ELB Tier, J2EE Web Services. NET Framework,Common Language Runtime, Base Class Libraries, Interoperability, Networking. Building Web applications, web Services. Overview of XML.

Text Books:

Unit I & II

1. Research Methodology Methods and Techniques , C. R. Kothari, New Age International publishers, 2nd Edition, 2005

Unit III

1. Data structures and Algorithms, Alfre V. Aho, John E. Hopcroft and Jeffrey D. Ullman, Addison – Weisly Publishing Company, 1987.
2. Computer Algorithm, Ellis Harowitz and Sartaj Sahini, Galgotier, Publications (P) Ltd., 1993.

Unit – IV

1. Database System Concepts (5th Edition), Abraham silberschatz, Henry F.Korth, S. Sudarshan
2. Fundamentals of Data base Systems , ramez Elmasri and Sharnkanth B.Navathe, 4th Edition , Perarson Education

Unit – V

1. The Essential Client/Server Survival Guide, Robert Orfali, Dan Harkey, Jerry Edwards, Galgotia Publications.
2. The Complete Reference J2EE, Jim Keogh Tata McGraw-Hill Edition, 2002.
3. J2EE 1.4 Bible, James McGovernetal Wiley Publishing Inc., 2003.
4. Visual Studio .NET Walkthroughs – Microsoft Manual.

Paper-III SEMINAR and VIVA-VOCE