IT-801 SOFT COMPUTING

UNIT-I

Soft Computing: Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.

Introduction to Neural Network: Concept, biological neural network, evolution of artificial neural network, McCulloch-Pitts neuron models, Learning (Supervise & Unsupervised) and activation function, Models of ANN-Feed forward network and feedback network, Learning Rules Hebbian, Delta, Perceptron Learning and Windrow-Hoff, winner take all.

UNIT – II

Supervised Learning: Perceptron learning,- Single layer/multilayer, linear Separability, Adaline, Madaline, Back propagation network, RBFN. Application of Neural network in forecasting, data compression and image compression.

UNIT – III

Unsupervised learning: Kohonen SOM (Theory, Architecture, Flow Chart, Training Algorithm) Counter Propagation (Theory, Full Counter Propagation NET and Forward only counter propagation net), ART (Theory, ART1, ART2). Application of Neural networks in pattern and face recognition, intrusion detection, robotic vision.

UNIT – IV

Fuzzy Set: Basic Definition and Terminology, Set-theoretic Operations, Member Function, Formulation and Parameterization, Fuzzy rules and fuzzy Reasoning, Extension Principal and Fuzzy Relations, Fuzzy if-then Rules, Fuzzy Inference Systems. Hybrid system including neuro fuzzy hybrid, neuro genetic hybrid and fuzzy genetic hybrid, fuzzy logic controlled GA. Application of Fuzzy logic in solving engineering problems.

UNIT – V

Genetic Algorithm: Introduction to GA, Simple Genetic Algorithm, terminology and operators of GA (individual, gene, fitness, population, data structure, encoding, selection, crossover, mutation, convergence criteria). Reasons for working of GA and Schema theorem, GA optimization problems including JSPP (Job shop scheduling problem), TSP (Travelling salesman problem), Network design routing, timetabling problem. GA implementation using MATLAB.

REFERENCES:-

1. S.N. Shivnandam, "Principle of soft computing", Wiley
2. Rich E and Knight K, Artificial Intelligence, TMH, New Delhi.
3. Klir & Yuan, Fuzzy sets & Fuzzy Logic: Theory & Appli.,PHI Pub.
4. S, Rajasekaran & G.A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & applications, PHI Publication.

LIST OF EXPERIMENTS

1. Form a Perceptron Net for basic gates with binary input and output
2. Using ADALINE Net, generate XOR function with bipolar inputs and targets
3. To Study the ADALINE NET and their training algorithm
4. To study the MADALINE NET and their training algorithm
5. Learn pattern, target output, learning rate and activation function
6. Obtain the output of the neuron Y for the network shown in fig: Using activation function as: a| binary sigmoidal b| binary sigmoidal [x1 x2 x3] = [0.8 0.6 0.4] [y1 y2 y3] = [0.1 0.3 -0.2] b=0.35
7. To implement AND function using Mc-Culloch Pitts neuron model
8. Design fuzzy inference system for a given problem
9. Implement Travelling salesman problem using Genetic algorithm
10. To study the training algorithm of ART

IT - 802-CLOUD COMPUTING

UNIT-I

Introduction, Cloud computing history, Cloud architecture, Characteristics of cloud computing as per NIST, Cloud services requirements, System Models for Distributed and Cloud Computing, NIST Cloud Computing Reference Architecture, Applications, ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis, Satellite Image Processing, CRM and ERP, Social networking.

UNIT-II

Cloud Reference Model, Types of Clouds, Cloud Interoperability & Standards, Scalability and Fault Tolerance, Design Challenges, Inter Cloud Resource Management, Resource Provisioning and Platform Deployment, Global Exchange of Cloud Resources, Cloud services (Iaas, Paas & Saas).

UNIT-III

Basics of Virtualization, Types of Virtualization, Implementation Levels of Virtualization, Virtualization Structures, Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices, Virtual Clusters and Resource management, Virtualization for Data-center Automation, Virtual LAN (VLAN) and Virtual SAN (VSAN) and their benefits.

UNIT-IV

Cloud Security:- Security Overview Infrastructure security, Data security and storage, Network security – I , Network security – II, Host security, Disaster recovery and management, Cloud Information security fundamentals, Cloud security services, Design principles, Secure Cloud Software Requirements, Policy Implementation, Cloud Computing Security Challenges, Virtualization security Management, Cloud Computing Security Architecture.

UNIT-V

Cloud Solutions: - Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management Third Party Cloud Services, Market Based Management of Clouds. Case study: - Amazon cloud services, Amazon EC2, Amazon S3, Google cloud services, Google Map reduce, GFS, Sales Force, Windows Azure- EMC cloud services, IBM cloud services, Apache Hadoop.

REFERENCES:

1. Kenneth Hess, Amy New Man – Practical Virtualization Solutions – Prentice Hall, 2010
2. Shahed Latif, Tim Mather, Subra Kumara swamy – Cloud Security and Privacy : An Enterprise perspective on risks and compliance – O'Reilly Media Inc., 2009
3. Gautam Shroff – Enterprise Cloud Computing: Technology, Architecture, Applications – Cambridg Press, 2010

LIST OF EXPERIMENTS

1. Creating and working with a new document in Google docs.
2. Preparing a presentation of ten slides on using Google docs.
3. Setting up service for running Hadoop daemons on windows 7
4. Create and Deploy a Cloud Service.
5. Study of Eucalyptus.
6. Installation of Eucalyptus Cloud.
7. Study of Cloudsim.
8. CloudSim setup and installation.
9. Working and installation of Google App Engine.
10. Working in Cloud9 to demonstrate different language.

ELECTIVE-II IT-803(A) NETWORK MANAGEMENT

UNIT-I

Network Management Framework, Network Based Managements, Evolution of Network Management: SGMP, CMIP, SNMP. Network Implementation and Management Strategies, Network Management Categories: Performance Management, Fault Management, Configuration Management, Security Managements, Accounting Managements. Network Management Configuration: Centralized Configuration, Distributed Configuration, Selected Management Strategy.

UNIT –II

Management Information Base (MIB), Structure of Management Information, NMS Presentation of the SMI, NMS Meter-ware Network View, Remote Monitoring (RMON), RMON Group. Desktop Management: Desktop Management Interface (DMI), DMI Architecture, DMI Browser, DMI/SNMP Mapping, Desktop SNMP Extension Agents, Setting up LAN Access, SNMP Configuration.

UNIT-III

Introduction, layering, OSI Layering, TCP/IP Layering, Protocols & Standards, Internet standards, Internet administration, Internet Addresses, Internet protocol: introduction, IP header, IP routing, subnet addressing, subnet mask, special case of IP addresses, Comparative Study of IPV4 & IPV6, port numbers Address Resolution Protocol, ARP packet format, Proxy ARP, ARP command, ARP Example, Reverse Address Resolution Protocol (RARP): Introduction, RARP Packet format, RARP Examples, RARP server design

UNIT-IV

Delivery and Routing of IP Packets, Routing Methods, Static versus Dynamic Routing, Routing table and Routing Module, Classless Addressing: CIDR. Internet Protocol (IP), Datagram, Fragmentation, Options, IP Package. Interior and Exterior Routing, Routing information protocol (RIP), Open shortest path first protocol (OSPF), BGP, GGP. Private Networks. Virtual Private Network (VPN), Network Address Translation (NAT).

UNIT –V

Internet Control Message Protocols (ICMP):-Types of message, message format, error reporting, query, checksum, ICMP Package. IGMP, IGMP Message and its Operation, IGMP Package. Transmission control protocol, Process-to-Process Communication, TCP Services Flow Control, TCP Timers. TCP Operation, TCP Package, Application layers protocol, Telnet Protocol, File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), X-Window system protocol, Remote procedure call, and Network file system.

REFERENCES:

1.Forouzan, TCP/IP Protocol Suite 4th edition, TMH
2.Stevens, TCP/IP Illustrated Volume-I, Pearson
3.J.Richard Burkey, Network Management Concept and Practice, PHI

ELECTIVE-II IT-803(B) DATA MINING & WAREHOUSING

UNIT I

Data Mining:- Basic concept ,technology and rules, DM techniques, Mining problems, Issues and Challenges in DM, application of data mining, KDD v/s Data Mining, DBMS v/s Data Mining, DM Application areas. Data mining techniques: Exploration of data mining methodologies, decision tables, decision trees, classification rules, association rules, clustering, statistical models & linear models.

UNIT II

Mining Association Rules in Large Databases:- Association Rule Mining, Single Dimensional Boolean Association Rules, Multi-Level Association Rule, Apriori Algorithm, FpGrowth Algorithm, Time series mining association rules, latest trends in association rules mining.

UNIT III

Rules & Clustering Techniques:- Introduction, Various association algorithms like A Priori, Partition, Pincer search etc. Clustering paradigms; Partitioning algorithms like K- Method, CLARA, CLARANS; Hierarchical clustering, DBSCAN, BIRCH, CURE; Categorical Clustering algorithms, STIRR, ROCK, CACTUS.

UNIT IV

Data Mining of Image and Video:- A case study. Image and Video representation techniques, feature extraction, motion analysis, content based image and video retrieval, clustering and association paradigm, knowledge Web mining: Introduction to web mining techniques, web basics and HTTP, data sources on the web, personalization, working with logs, forms and cookies, user identification and path analysis, E-Metrics.

UNIT V

Data Warehousing:- Need for data warehousing , Basic elements of data warehousing, Data Mart, Data Warehouse Architecture, extract and load Process, Clean and Transform data, Star, Snowflake and Galaxy Schemas for Multidimensional databases, Fact and dimension data, Partitioning Strategy-Horizontal and Vertical Partitioning.

REFERENCES:-

1. Han, Kamber, "Data Mining Concepts & Techniques".
2. M.Kaufman. Data Mining Techniques; Arun K.Pujari ; University Press.
3. Mastering Data Mining; Berry Linoff; Wiley
4. Data Mining; Adriaans & Zantinge; Pearson education.

ELECTIVE-II IT-803(C) AD-HOC NETWORK

UNIT I

Introduction:- Introduction-Fundamentals of Wireless Communication Technology, The Electromagnetic Spectrum, GSM, GPRS, PCS, WLAN and UMTS, Components of Packet Radios, Routing in PRNETs, Ad Hoc Wireless Networks, Wireless Sensor Networks, Traffic Profiles, Types of Ad Hoc Mobile Communications, Types of Mobile Host Movements, Challenges Facing Ad Hoc Mobile Networks.

UNIT II

Ad Hoc wireless MAC protocols:- Introduction, Synchronous and asynchronous MAC protocols, Problem in Ad Hoc channel access, Receiver-initiated and sender-initiated MAC protocols, Existing Ad Hoc MAC protocols, Ad Hoc Routing Protocols- Introduction, Classifications of Routing Protocols: Table-Driven Routing Protocols – Destination Sequenced Distance Vector (DSDV), Wireless Routing Protocol (WRP), Source-Initiated On-Demand Approaches - Ad Hoc On-Demand Distance Vector Routing (AODV), Dynamic Source Routing (DSR), Temporally Ordered Routing Algorithm (TORA), Signal Stability Routing (SSR) Location Aided Routing (LAR).

UNIT III

Multicast routing In Ad Hoc Networks:- Introduction, Issues in Designing a Multicast Routing Protocol, Operation of Multicast Routing Protocols, An Architecture Reference Model for Multicast Routing Protocols, Classifications of Multicast Routing Protocols, Tree-Based Multicast Routing Protocols, Mesh- Based Multicast Routing Protocols, Summary of Tree-and Mesh-Based Protocols - Energy-Efficient Multicasting.

UNIT IV

Transport Layer, Security Protocols:- Introduction, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management.

UNIT V

QoS and Energy Management: -Introduction, Issues and Challenges in Providing QoS in Ad Hoc Wireless Networks, Classifications of QoS Solutions, MAC Layer Solutions, Network Layer Solutions, Energy Management in Ad Hoc Wireless Networks – Introduction, Need for Energy Management in Ad Hoc Wireless Networks, Classification of Energy Management Schemes.

REFERENCES BOOKS:-

1. C. Siva Ram Murthy and B.S. Manoj "Ad Hoc Wireless Networks: Architectures and Protocols", Pearson Education.
2. C.K. Toh, "Ad Hoc Mobile Wireless Networks: Protocols and Systems", Pearson Education.
3. George Aggelou, "Mobile Wireless Networks", Tata McGraw- Hill.

ELECTIVE III IT- 804 (A) WIRELESS NETWORK

UNIT – I

Introduction of Wireless Networks, wireless network architectures, Different Generations of Wireless Networks. Characteristics of the Wireless Medium: Radio Propagation Mechanisms, Path Loss Modeling and Signal Coverage, Effect of Multipath and Doppler, Channel Measurement and Modeling Techniques. Narrowband digital modulation and Coding under wireless fading environments.

UNIT – II

Introduction WLAN technologies:- Infrared, UHF narrowband, spread spectrum IEEE802.11: System architecture, protocol architecture, physical layer, MAC layer, 802.11b, 802.11a – Hiper LAN: WATM,BRAN, HiperLAN2 – Bluetooth: Architecture, Radio Layer, Baseband layer, Link manager Protocol, security IEEE802.16WIMAX: Physical layer, MAC, Spectrum allocation for WIMAX.

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UNIT – III

Network Planning: Introduction, Wireless Network Topologies, Cellular Topology, Cell Fundamentals, Signal to Interferences Radio Calculations, Network Planning for CDMA Systems. Wireless Network Operations: Mobility Management, Radio Resources and Power Management.

UNIT – IV

Introduction Mobile IP:- IP packet delivery, Agent discovery, tunneling and encapsulation, IPV6 Network layer in the internet Mobile IP session initiation protocol mobile adhoc network: Routing, Destination Sequence distance vector, Dynamic source routing. MOBILE TRANSPORT LAYER TCP enhancements for wireless protocols Traditional TCP: Congestion control, fast retransmit/fast recovery, Implications of mobility Classical TCP improvements: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective retransmission, Transaction oriented TCP, TCP over 3G wireless networks.

UNIT – V

IEEE 802.15 WPAN, Home RF, Bluetooth, Interference between Bluetooth and 802.11, Adhoc Networks, Introduction to 2.5G and 3G Networks., 3GSGSN, 3GGGSN, SMSGMSC/ SMSIWMSC, Firewall, DNS/DHCP High speed Downlink packet access (HSDPA) LTE network architecture and protocol. 4G NETWORKS Introduction – 4G vision – 4G features and challenges Applications of 4G – 4G Technologies: Multicarrier Modulation, Smart antenna techniques, OFDMMIMO systems, Adaptive Modulation and coding with time slot scheduler, Cognitive Radio.

REFERENCES:

1. Erik Dahlman, Stefan Parkvall, Johan Skold and Per Beming, "3G Evolution HSPA and LTE for Mobile Broadband", Second Edition, Academic Press, 2008.
2. Anurag Kumar, D.Manjunath, Joy kuri, "Wireless Networking", First Edition, Elsevier 2011.
3. Simon Haykin, Michael Moher, David Koilpillai, "Modern Wireless Communications", First Edition, Pearson Education 2013

ELECTIVE III IT- 804 (B) IMAGE PROCESSING

UNIT I

Image representation, fundamental steps in image processing, image model. Sampling & quantization. Neighbors of a pixel, connectivity and distance measures. Basic transformations and perspective transformations. Two dimensional Fourier transform, Discrete Fourier transform and their properties. Fast Fourier transform, Walsh Transform, Hadamard transform and Discrete Cosine transform.

UNIT II

Image Enhancement:- Intensity transformations, histogram processing, Image subtraction, image averaging, Spatial filtering-smoothing and sharpening filters, frequency domain filtering methods-low pass filtering, high pass filtering, median filtering.

UNIT III

Image compression:- Redundancy and its types. Image compression model, variable length coding, bit plane coding, constant area coding, run length coding, lossless and lossy predictive coding, transform coding.

UNIT IV

Image restoration and Segmentation:- Degradation model, effect of diagonalisation on degradation, algebraic approach. Detection of discontinuities by point, line and edge detection. Edge linking, graph theoretic techniques, thresholding techniques, region oriented segmentation.

UNIT V

Representation & Description: Chain codes, polygonal approximations, signatures, boundary segments, skeleton, boundary descriptors, shape descriptors regional descriptors, image morphology-dilation, erosion, opening, closing, thickening, thinning, skeleton, pruning, hit or miss transform.

References:-

1. R.C Gonzalez & Richard E Wood, "Digital Image Processing" ,Addison Wesley Publishing
2. Anil K Jain, "Fundamentals of Digital image processing".
3. Sonka, Hlavac, Boyle, "Digital image processing and computer vision", cengage learning, India Edition.
4. B Chanda, D. Dutta Majumder, "Digital image Processing and Analysis", PHI.

ELECTIVE III IT- 804(C) BIOINFORMATICS

UNIT-I

Introduction:-Introduction to bioinformatics, objectives of bioinformatics, Basic chemistry of nucleic acids, structure of DNA & RNA, Genes, structure of bacterial chromosome, cloning methodology, Data maintenance and Integrity Tasks.

UNIT-II

Bioinformatics Databases & Image Processing :- Types of databases, Nucleotide sequence databases, Protein sequence databases, Protein structure databases, Normalization, Data cleaning and transformation, Protein folding, protein function, protein purification and characterization, Introduction to Java clients, CORBA, Using MYSQL, Feature Extraction.

UNIT-III

Sequence Alignment and database searching:- Introduction to sequence analysis, Models for sequence analysis, Methods of optimal alignment, Tools for sequence alignment, Dynamics Programming, Heuristic Methods, Multiple sequence Alignment

UNIT-IV

Gene Finding and Expression:- Cracking the Genome, Biological decoder ring, finding genes through mathematics & learning, Genes prediction tools, Gene Mapping, Application of Mapping, Modes of Gene Expression data, Mining the Gene Expression Data.

UNIT-V

Proteomics & Problem solving in Bioinformatics:- Proteome analysis, tools for proteome analysis, Genetic networks, Network properties and analysis, complete pathway simulation: E-cell, Genomic analysis for DNA & Protein sequences, Strategies and options for similarity search, flowcharts for protein structure prediction .

References:-

1.Gopal & Jones, BIOINFORMATICS with fundamentals of Genomics & Proteomics, TMH Pub
2.Rastogi, Bioinformatics –Concepts, skills & Applications, CBS Pub
3.Bergeron, Bioinformatics computing, PHI
4.Claverie, Bioinformatics, Wiley pub

IT-806- PROGRAMMING IN PHP

Introduction to PHP:-Evaluation of Php, Basic Syntax, Defining variable and constant, Php Data type, Operator and Expression.

Handling HTML Form With PHP:- Capturing Form Data, Dealing with Multi-value filed, Generating File uploaded form , Redirecting a form after submission.

Decisions and loop:- Making Decisions, Doing Repetitive task with looping , Mixing Decisions and looping with Html.

Function:- What is a function, Define a function, Call by value and Call by reference, Recursive function.

String:- Creating and accessing String, Searching & Replacing String, Formatting String, String Related Library function.

Array:- Anatomy of an Array, Creating index based and Associative array, Accessing array Element, Looping with Index based array, Looping with associative array using each() and foreach(), Some useful Library function.

Working with file and Directories:-Understanding file& directory ,Opening and closing a file, Coping ,renaming and deleting a file , Working with directories, Building a text editor , File Uploading & Downloading.

State management:-Using query string(URL rewriting), Using Hidden field ,Using cookies, Using session .

String matching with regular expression:-What is regular expression, Pattern matching in Php , Replacing text ,Splitting a string with a Regular Expression.

Generating Images with PHP:- Basics of computer Graphics, Creating Image , Manipulating Image, Using text in Image.

References:

(i.) Learning PHP, MySQL, books by ‘ O’ riley Press

(ii.) PHP & MySQL: Novice to Ninja by Kevin Yank

(iii.) PHP for the Web: Visual QuickStart Guide (4th Edition) by Larry Ullman

List of Experiments:-

1. Write a program to print Factorial of any number.
2. Write a program in PHP to print Fibonacci series.
3. Write a program to find whether a number is Armstrong or not.
4. Write a program to print Reverse of any number.
5. Write a program to print Reverse of any number.
6. Write a program to check whether a number is Prime or not.
7. Program to find whether a year is LEAP year or not.
8. Write a Program for finding the biggest number in an array without using any array functions.
9. Write a Program to swap two numbers in PHP.
10. Write a Program for finding the smallest number in an array