BE **VIII** Semester Computer Science & Engg.							
COURSE CONTENTS (UEC SCHEME)							
CS-8001	Soft Computing	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	3	1	2	6	70	22

Unit – I
Soft Computing : Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing. Artificial Intelligence : Introduction, Various types of production systems, characteristics of production systems, breadth first search, depth first search techniques, other Search Techniques like hill Climbing, Best first Search, A* algorithm, AO* Algorithms and various types of control strategies. Knowledge representation issues, Prepositional and predicate logic, monotonic and non monotonic reasoning, forward Reasoning, backward reasoning, Weak & Strong Slot & filler structures, NLP.

Unit – II
Neural Network : Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithm, Linear separability, Widrow & Hebb;s learning rule/Delta rule, ADALINE, MADALINE, AI v/s ANN. Introduction of MLP, different activation functions, Error back propagation algorithm, derivation of BBPA, momentum, limitation, characteristics and application of EBPA,

Unit – III
Counter propagation network, architecture, functioning & characteristics of counter Propagation network, Hopfield/ Recurrent network, configuration, stability constraints, associative memory, and characteristics, limitations and applications. Hopfield v/s Boltzman machine. Adaptive Resonance Theory: Architecture, classifications, Implementation and training. Associative Memory.

Unit – IV
Fuzzy Logic: Fuzzy set theory, Fuzzy set versus crisp set, Crisp relation & fuzzy relations, Fuzzy systems: crisp logic, fuzzy logic, introduction & features of membership functions, Fuzzy rule base system : fuzzy propositions, formation, decomposition & aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

Unit – V
Genetic algorithm : Fundamentals, basic concepts, working principle, encoding, fitness function, reproduction, Genetic modeling: Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator, Generational Cycle, Convergence of GA, Applications & advances in GA, Differences & similarities between GA & other traditional methods.

References :

S, Rajasekaran & G.A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic & Genetic
Algorithms, Synthesis & applications, PHI Publication.
S.N. Sivanandam & S.N. Deepa, Principles of Soft Computing, Wiley Publications
Rich E and Knight K, Artificial Intelligence, TMH, New Delhi.
Bose, Neural Network fundamental with Graph, Algo.& Appl, TMH
Kosko: Neural Network & Fuzzy System, PHI Publication
Klir & Yuan, Fuzzy sets & Fuzzy Logic: Theory & Appli.,PHI Pub.
Hagen, Neural Network Design, Cengage Learning

BE VIII Semester Computer Science & Engg.							
COURSE CONTENTS (UEC SCHEME)							
CS-8002	Web Engineering	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	3	1	2	6	70	22

UNIT-1

An Introduction to Web Engineering, History of web Development, Time line, Motivation, Categories of Web Applications, Characteristics of Web Applications. Evolution and Need for Web Engineering, Web Engineering Models, Software Engineering v/s Web Engineering . World Wide Web: Introduction to TCP/IP and WAP, DNS, Email, TelNet, HTTP and FTP. Introduction to Browser and search engines, Search fundamentals, Search strategies, Directories search engines and Meta search engines, Working of the search engines , Miscellaneous Web Browser details, Introduction to Web Servers: Features of web servers, caching, case study-IIS, Apache, Configuring web servers.

UNIT- 2

Information Architecture: The role of the Information Architect, Collaboration and Communication, Organizing Information, Organizational Challenges, Organizing Web sites parameters and Intranets Creating Cohesive Websites: Conceptual Overview Website Development, Website Design issues, Conceptual Design, High-Level Design, Indexing the Right Stuff, Grouping Content. Architectural Page Mockups, Design Sketches, Navigation Systems. Searching Systems Good & bad web design, Process of Web Publishing. Phases of Web Site development, enhancing your web-site, submission of website to search engines Web security issues, security audit of websites, Web effort estimation, Productivity, Measurement, Quality usability and reliability. Requirements Engineering for Web Applications: Introduction, Fundamentals, Requirement Source, Type, Notations Tools. Principles Requirements Engineering Activities, Adapting RE Methods to Web Application.

UNIT- 3

Technologies for Web Applications: HTML and DHTML, HTML Basic Concepts, Static and dynamic HTML, Structure of HTML documents, HTML Elements, Linking in HTML, Anchor Attributes, Image Maps, Meta Information, Image Preliminaries, Layouts, Backgrounds, Colors and Text, Fonts, Tables, Frames and layers, Audio and Video Support with HTML Database integration, CSS, Positioning with Style sheets, Forms Control, Form. Elements. Introduction to CGI PERL, JAVA SCRIPT, PHP, ASP, Cookies Creating and Reading Cookies

UNIT-4

Technologies for Web Applications: Introduction of XML, Validation of XML documents, DTD, Ways to use XML, XML for data files, HTML Vs XML, Embedding XML into HTML documents, Converting XML to HTML for Display, Displaying XML using CSS and XSL, Rewriting HTML as XML, Relationship between HTML, SGML and XML, web personalization , Semantic web, Semantic Web Services, Ontology.

UNIT- 5

E- Commerce, E-commerce Business Models, The Internet and World Wide Web: E-commerce Infrastructure, Building an E-commerce Web Site, Electronic Commerce environment and opportunities. Modes of Electronic Commerce, Approaches to safe Electronic Commerce, Electronic Cash and Electronic Payment Schemes, Online Security and Payment Systems, Ecommerce Marketing Concepts, Advertising on the Internet: issues an Technologies, Ecommerce Marketing Concepts Electronic Publishing issues, approaches, legalities and technologies, Privacy and Security Topics: Introduction, Web Security, Encryption schemes, Secure Web document, Digital Signatures and Firewalls, Cyber crime and laws, IT Act.

TERM WORK

1. At least ten practical experiments based on above syllabus and a mini project is desirable to be completed by a group of three that cover following tools.
• HTML
• DHTML
•PHP
- XML
• Java Script, CGI, PERL
• ASP

Recommended Books:

1. Roger S.Pressman, David Lowe, "Web Engineering", Tata Mcgraw Hill Publication, 2007
2. Achyut S Godbole and Atul Kahate, "Web Technologies", Tata McGraw Hill
3. Gopalan N P ,Akilandeswari "Web Technology: A Developer s Perspective" , PHI
4. NEIL GRAY "Web server Programming" WIley
5. CHRIS BATES Web Programming : Building Internet applications Wiley
6. Moller, "An Introduction to XML and Web Technologies", Pearson Education New Delhi, 2009
7. Beginning XML 4th Edition Hnter, Refter, Fawset Wiley India
8. Internet & World Wide Web How to Program, Pearson education, 3rd edition, by: H.M. Deitel, P.J. Deitel, A.B. Goldberg.
9. C. Xavier, "Web Technology & Design", Tata McGraw Hill.
10 Ivan Bay Ross, "HTML, DHTML, Java script, Perl CGI", BPB

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.

List of 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
5.   Baxevanis, Bioinformatics, Wiley Pub
6.   Stekel, Micrarray BioInformatics, Cambridge

BE VIII Semester Computer Science & Engg.							
COURSE CONTENTS (UEC SCHEME)							
CS-8012	Digital Image Processing	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	3	1	0	4	70	22

Unit-I
Digital Image fundamentals, A simple image model, Sampling and Quantization. Relationship between pixels. Imaging geometry. Image acquisition systems, Different types of digital images

Unit-II
Image transformations, Introduction to Fourier transforms, Discrete Fourier transforms, Fast Fourier transform, Walsh transformation, Hadmord transformation, Discrete Cosine Transformation.

Unit-III
Image enhancement, Filters in spatial and frequency domains, Histogram based processing. Image subtraction, Averaging, Image smoothing, Nedion filtering, Low pass filtering, Image sharpening by High pass filtering.

Unit-IV
Image encoding and segmentation, Encoding: Mapping, Quantizer, Coder. Error free compression, Lossy Compression schemes. JPEG Compression standard. Detection of discontinuation by point detection, Line detection, edge detection, Edge linking and boundary detection, Local analysis, Global processing via Hough transforms and graph theoretic techniques

Unit-V
Mathematical morphology- Binary, Dilation, crosses, Opening and closing, Simple methods of representation, Signatures, Boundary segments, Skeleton of a region, Polynomial approximation

References:
1. Rafael C Gonzalez, Richard E Woods 3rd Edition, Digital Image Processing Pearson.
2. Rafael C Gonzalez, Richard E Woods 3rd Edition, Digital Image Processing using Matlab – TMH.
3. Sonka, Digital Image Processing & Computer Vision, Cengage Learning
4 Jayaraman, Digital Image Processing, TMH.
5. Pratt, Digital Image Processing, Wiley India
6 Annadurai, Fundamentals of Digital Image Processing, Pearson Education.

BE **VIII** SEMESTER COMPUTER SCIENCE & ENGG.						
COURSE CONTENTS (UEC SCHEME)						
CS-8013	Wireless Network	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	3	1	0	4	70	22

Unit - I
Introduction of Wireless Networks, Different Generations of Wireless Networks. Characteristics of the Wireless Medium: Radio Propagation Mechanisms, Path Loss Modelling and Signal Coverage, Effect of Multipath and Doppler, Channel Measurement and Modelling Techniques.

Unit - II
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 - III
Multiple Division Techniques: FDMA, TDMA, CDMA, OFDM, SDMA. Comparison of Multiple Division Techniques, Modulation Techniques – AM, FM, FSK, PSK, QPSK, QAM, 16QAM Mobile Data Networks: Introduction, Data Oriented CDPD Network, GPRS, EDGE and High Data Rates, SMS in GSM, Mobile Application Protocols.

Unit - IV
Introduction to Wireless LAN, Evolution of WLAN, Wireless Home Networking, Technologies for Home Area Network (HAN), Overview of IEEE 802.11, Reference Architecture, PHY and MAC Layer, Wireless ATM, HIPERLAN.

UNIT - V
IEEE 802.15 WPAN, HomeRF, Bluetooth, Interference between Bluetooth and 802.11, Adhoc Networks, Introduction to 2.5 G and 3 G Networks.

References
1. Kaveh Pahlavan, Prashant Krishnamurthy "principles of Wireless Networks", PHI.
2. Qing- An Zeng, Dharma Prakash Agrawal "Introduction to Wireless and Mobile Systems" CENGAGE Learning.
3. Sumit Kasera, Nishit Narang, A P Priyanka "2.5 G Mobile Networks: GPRS and EDGE", TMH
4. Dr. KAMILO FEHER "Wireless Digital Communications" , PHI
5. Jochen Schiller " Mobile Communications", PEARSON

BE **VIII** SEMESTER COMPUTER SCIENCE & ENGG.							
COURSE CONTENTS (UEC SCHEME)							
CS-8021	User Interface Design	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	3	1	0	4	70	22

BE **VIII** SEMESTER COMPUTER SCIENCE & ENGG.						
COURSE CONTENTS (UEC SCHEME)						
CS-8022	Software Architecture	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	3	1	0	4	70	22

BE **VIII** SEMESTER COMPUTER SCIENCE & ENGG.							
COURSE CONTENTS (UEC SCHEME)							
CS-8023	MANET & Hi Speed Network	**L**	**T**	**P**	**C**	**Max. Marks**	**Min. Marks**
Duration	3 Hours	3	1	0	4	70	22

Unit – I
Adhoc – Wireless N/WS: Introduction, Cellular vs Adhoc wireless Networks, Applications of Adhoc wireless Networks, Issues in Adhoc wireless N/WS. Heterogeneity in Mobile devices, Wireless Sensor N/WS, traffic Profiles, Types of Adhoc Mobile Communications, Types of Mobile Host movements, Challenges facing Ad hoc mobile N/WS.

Unit – II
Adhoc Wireless Media Access Protocols: Introduction Synchronous MAC Protocol & asynchronous MAC protocol, Problems in Adhoc channel Access Receiver Initiated MAC protocols, Sender. Initiated MAC Protocol, Existing Adhoc MAC Protocol.

Unit – III
Overview of Adhoc Routing Protocols: Table Driver Approaches: DSDV, WRP, CSGR, Source Initiated On demand Approaches : AODV, DSR, TORA, SSR, LAR, PAR, ZRP, RDMAR.

Unit – IV
Communication Performance of Adhoc Networks, Route discovery time, End to End Delay Performance, Communication throughput performance, Packet loss performance, Route reconfiguration time, Energy Conservation & Power life issues.

Unit – V
High Speed Networks Frame relays, Packet Switching Vs frame relay N/WS. Asynchronous transfer node, ATM protocol architecture, ATM Logical Connection, ATM Cells, AAL, High Speed LANS, FAST Ethernet, fiber channel wireless LANS.

Books :
1) Muthukumaran, Intorduction to high Performance Network, TMH
2) CK Toh, Adhoc Mobile Wireless Networks Protocols & Systems, Pearson. Pearson Publication
3) C-Siva Ram Murthy & B S Majo, Adhoc Wireless Networks, Architectures Protocols Pearson. Pearson Publication
4) High speed N/WS & Internals, Performance & QOS William Stalling., IInd Edition. Pearson Publication
5) Computer System& Network, Bluldell, Cengage Learning