

**MAHATMA GANDHI
UNIVERSITY**

B.TECH. DEGREE COURSE

8TH SEMESTER

**SCHEME
&
SYLLABUS**

2002

**COMPUTER SCIENCE
&
ENGINEERING BRANCH**

COMPUTER SCIENCE & ENGINEERING

SCHEME

8TH SEMESTER

Course Code	Course No.	Subject	Teaching Periods			Uty. Exam duration (hours)	Marks			
			L	T	Prac./ Proj.		Sessional	Theory	Practical	Total
A	RT801	Security in Computing	2	1	-	3	50	100	-	150
B	R 802	High Performance Computing	2	1	-	3	50	100	-	150
C	R 803	Principles of Programming Languages	3	1	-	3	50	100	-	150
D	RT804	Artificial Intelligence	3	1	-	3	50	100	-	150
E	R 805	Elective II	3	1	-	3	50	100	-	150
F	R 806	Elective III	3	1	-	3	50	100	-	150
G	R 807	Graphics and Multimedia Lab	0	0	4	3	50	-	100	150
H	R 808	Project & Seminar	0	0	4	-	100	-	-	100
I	R809	Viva-Voce	-	-	-	-	-	-	50	50
		Total	16	6	8		450	600	150	1200

SYLLABUS

SECURITY IN COMPUTING

RT 801

2+1+0

Module1

Introduction: Security basics – Aspects of network security – Attacks – Different types – Hackers – Crackers – Common intrusion techniques –Trojan Horse, Virus, Worm – Security services and mechanisms.

Module 2

OS Security – Protection Mechanisms –Authentication & Access control – Discretionary and Mandatory access control – Authentication mechanisms – Official levels of computer security (DoD) - Security breaches – Concept of a hole - Types of a holes – Study of the security features for authentication, access control and remote execution in UNIX, WINDOWS 2000

Module 3

Cryptography: Basic Encryption & Decryption – Transposition & substitution ciphers – Caesar substitution – Polyalphabetic substitutions – Crypt analysis – Symmetric key algorithms – Fiestel Networks – Confusion – Diffusion – DES Algorithm – Strength of DES – Comparison & important features of modern symmetric key algorithms – Public key cryptosystems – The RSA Algorithm – Diffice Hellman key exchange – comparison of RSA & DES – Message Authentication & Hash functions – Digital signature

Module 4

Network & Application Security: Kerberos – X509 Authentication service – IP security Architecture – Secure socket layer – Electronic mail security – Pretty Good privacy – S/MIME – secure Electronic Transactions – Firewalls - Security mechanisms in JAVA platform – Applet security – Security policy and Security Manager.

Module 5

Database Security: - Security issues – SQL security DAC based on granting & revoking privileges – MAC for multilevel security – Statistical database security.

Text Books

1. Module1, 4 Network Security Essentials Applications & Standards, William S., Pearson Education Asia
2. Module2 Modern operating System, Andrew S. Tanenbaum, Pearson Education Asia
3. Using JAVA 2 platform, Joseph L. Weber, Prentice Hall of India
4. Module3 Cryptography and network security principles and practice, William Stallings, Pearson Education Asia

5. Information theory coding and cryptography, Ranjan Bose, TMH
6. Module 4,5 Designing security Architecture Solutions, Jay Ramachandran, Wiley Dreamtech
7. Module5 Database Security Mechanisms for Computer Network, Sead Muftic, John wiles

References

1. Security in Computing - Charles P. Pfleeger IEEE Computer Science Press
2. Database Security Mechanisms for Computer Network- Sead Muftic, John wiles
3. Designing Security Architecture Solutions – Jay Ramachandran, Wiley dreamtech
4. Firewalls Complete - Marcus Gonsalvus, TMH
5. Networking Technologies - Jaisal, Galgotia Publication
6. Security in Computer Operating System - G.O.Shea, NCC Blackwell Manchester Oxford
7. Mastering JAVA security: Cryptography, Algorithms and Architecture - Rich Helton, Wiley Dreamtech
8. Implementing IPv6- Mark A. Miller P.E, IDG Books

HIGH PERFORMANCE COMPUTING

R802

2+1+0

Module1

Introduction to parallel processing - Trends towards parallel processing - Parallelism in uniprocessor - Parallel computer structures-Architecture classification schemes - Indian contribution to parallel processing.

Module 2

Principles of pipelining and vector processing - Linear pipelining - Classification of pipeline processors - General pipelines - Instruction and Arithmetic pipelines – Design of Pipelined instruction unit-Principles of Designing Pipeline Processors- Instruction prefetch and branch handling- Dynamic pipelines - Architecture of Cray-1.

Module 3

Array processors - SIMD array processors - Interconnection networks - Static vs dynamic networks - mesh connected networks - Cube interconnection networks - Parallel algorithms for array processors - SIMD matrix multiplication-Parallel sorting on array processors - Associative array processing - Memory organization.

Module 4

Multiprocessor architectures and Programming - Loosely coupled and Tightly coupled multiprocessors - Interconnection networks - Language features to exploit parallelism - Process synchronisation mechanisms.

Module5

Dataflow computers - Data driven computing and Languages - Data flow computers architectures - Static data flow computer -Dynamic data flow computer -Data flow design alternatives.

Text Book

1. Computer Architecture & Parallel Processing - Kai Hwang & FayeA.Briggs, McGraw Hill

References

1. Elements of Parallel computing - V. Rajaraman - PHI
2. Super Computers - V. Rajaraman - Wiley arstern
3. Parellel Processing for Super Computers & AI - Kai Hwange & Douglas Degneot
4. Mc Graw Hill
5. Highly parallel computing - George S. Almasi, Allan Gottlieb - Benjamin Cumings Publishers.
6. High Performance Computer Architecture - Harold S. Stone, Addison Wesley.
7. Advanced Computing - Vijay P.Bhatkar, Asok V.Joshi, Arirban Basu, Asok K.Sharma.

PRINCIPLES OF PROGRAMMING LANGUAGES

R803

3+1+0

Module1

Introduction – Role of programming languages - Effects of Environments on languages - Language Design issues - Virtual computers and binding times, Language Paradigms.

Module2

Data types - Specification of data types, implementation of elementary data types, Declarations, type checking and type conversion - Assignment and Initialisation - Structured data types - Specification of data structure types, Implementation of data structure type - Declarations and type checking for data structures.

Module 3

Abstract data types, Encapsulation by subprogram - Type definition, storage management - Sequence Control - Implicit and Explicit sequence control, sequencing with arithmetic expressions, sequence control between statements.

Module 4

Subprogram control - Subprogram sequence control, attributes of data control, Shared data in subprograms - Abstract data types revisited, Inheritance, Polymorphism.

Module 5

Advances in Language design - Variations of subprogram control, Parallel programming, Introduction to exception handling - Exception handling in JAVA, Hardware developments, software architecture.

Text Book

1. Programming Languages, Design & Implementation - Terrence W. Pratt, Marvin V. Zelkowitz., Pearson Education Asia / Prentice Hall of India

Reference

1. Programming Languages - Robert W Sebesta, Pearson EducationAsia

ARTIFICIAL INTELLIGENCE

RT 804

3+1+0

Module 1

Introduction – Definitions – AI application areas – Example problems- Problems and problem spaces - Problem characteristics – Problem solving by searching, Searching strategies – Breadth first search, Uniform cost search, DFS, Depth – Limited search, Bi-directional search – Constraint satisfaction search.

Module 2

Informed search, A* algorithm, Heuristic functions – Inventing Heuristic functions - Heuristic for constraint satisfaction problem – Iterative deepening – Hill climbing – Simulated Annealing.

Module3

Game playing and knowledge structures – Games as search problem – Imperfect decisions – Evaluation functions – Alpha – Beta pruning – state of art game programs, Introduction to frames and semantic nets.

Module 4

Knowledge and Reasoning – Review of representation and reasoning with Logic – Inference in first order logic, Inference rules involving quantifiers, modus ponens, Unification, forward and backward chaining – Resolution.

Module 5

Introduction to Prolog – Representing facts – Recursive search – Abstract data types – Alternative search strategies – Meta predicates, Matching and evaluation, meta interpreters – semantic nets & frames in prolog.

Text Books

Module 1,2,3,4

1. Artificial Intelligence – A modern approach, Stuart Russell – Peter Narang, Pearson Education Asia
2. Artificial Intelligence Rich E. - McGraw Hill Book Company

Module 5

3. Artificial Intelligence, George F Luger, Pearson Education Asia

References

1. An Introduction to Artificial Intelligence – Eugene Charniak & Drew McDermot, Pearson Education Asia

ELECTIVE - II

R805

3+1+0

List of electives

1. Advanced Mathematics
2. Client-Server Computing
3. E-Commerce
4. Analysis and Modeling of Digital Systems
5. Distributed Computing
6. User Interface Design

Note

New Electives may be added according to the needs of emerging fields in technology. The name of the elective and its syllabus should be submitted to the university before the course is offered.

ADVANCED MATHEMATICS (ELECTIVE - I)

CMELR 805-1

3+1+0

Module 1 Green's Function

Heavisides, unit step function – Derivative of unit step function – Dirac delta function – properties of delta function – Derivatives of delta function – testing functions – symbolic function – symbolic derivatives – inverse of differential operator – Green's function – initial value problems – boundary value problems – simple cases only

Module 2 Integral Equations

Definition of Volterra and Fredholm Integral equations – conversion of a linear differential equation into an integral equation – conversion of boundary value problem into an integral equation using Green’s function – integral equation with separable Kernels – Integral equations of convolution type – Neumann series solution.

Module 3 Gamma, Beta functions

Gamma function, Beta function – Relation between them – their transformations – use of them in the evaluation certain integrals – Dirichlet’s integral – Liouville’s extension of Dirichlet’s theorem – Elliptic integral – Error function.

Module 4 Power Series solution of differential equation

The power series method – Legendre’s Equation – Legendre’s polynomial – Rodrigues formula – generating function – Bessel’s equation – Bessel’s function of the first kind – Orthogonality of Legendre’s Polynomials and Bessel’s functions.

Module 5 Numerical solution of partial differential equations.

Classification of second order equations- Finite difference approximations to partial derivatives – solution of Laplace and Poisson’s equations by finite difference method – solution of one dimensional heat equation by Crank – Nicolson method – solution one dimensional wave equation.

References

1. Linear Integral Equation- Ram P.Kanwal, Academic Press, New York
2. A Course on Integral Equations - Allen C.Pipkin, Springer – Verlag
3. Advanced Engg. Mathematics - H.K.Dass, S.Chand
4. Advanced Engg. Mathematics- Michael D.Greenberge, Pearson Edn. Asia
5. Numrical methods in Engg. & Science - B.S.Grewal, Khanna Publishers
6. Generalized functions - R.F. Hoskins, John Wiley and Sons.
7. Principles and Techniques of Bernard Friedman - John Wiley and sons Applied Mathematics
8. Principles of Applied Mathematics- James P.Keener, Addison Wesley.
9. Numerical methods - P.Kandasamy, K.Thilagavathy, K.Gunavathy, S.Chand & co

CLIENT SERVER COMPUTING (ELECTIVE - II)

RT 805-2

3+1+0

Module 1 Introduction

History - uses - Client Server Computing & Hetrogenous Computing - Cross Platform Computing Distributed Computing - The costs of Client Server Computing - Advantages and Disadvantages - Client Server Databases.

Module 2 Design

Fundamentals of client server design - Managing the interaction of client and server - Communications Techniques protocols & Client server interaction protocols - Preparing applications for client server - Optimizing applications for client server - Example client server implementations - Request acceptance dispatching - Execution of requests - Client server interaction using message.

Module 3 Multitasking

Multi programming vs multitasking - Processor - Advantages and draw backs of multiple processor - Child and parent processor - Case study Novell Netware and Windows NT - Developing server applications - Threads - Server communication model.

Module 4 Synchronization

Scheduling implementations - processing queues - context switching pre emptive systems - critical sections - mutual exclusion - semaphores - semaphore implementations in NT & Netware.

Module 5 Communications

Network communication - Inter process communication - Building portable client server applications.

References

1. Novell's Guide to Client-Server Application & Architecture- Jeffrey D.Schqnk, Novell Press.
2. Client Server Computing - Dawna Travis Dewire, McGraw Hill.
3. Developing Client Server Applications - W.H.Inman, BPB.
4. Guide to Client Server Databases - Joe Salemi, BPB.
5. Client Server Strategies- David Vaskevitch, Galgotia.

E-COMMERCE (ELECTIVE - II)

R805-3

3+1+0

Module1 Introduction to Electronic Commerce

E-Commerce Framework, Anatomy of E-Commerce Applications, E-Commerce Consumer & Organization Applications. E- Commerce and World Wide Web – Internet Service Providers, Architectural Framework for Electronic Commerce, WWW as the Architecture, Hypertext publishing.

Module 2 Network Security

Client-Server Network Security, CS Security Threats, Firewalls, Data & Message Security, Encrypted Documents, Security on the Web.

Module 3 Electronic Payment Systems

Types of Electronic Payment Systems, Digital Token Based Electronic Payment System, Smart Cards, Credit Cards, Risk in Electronic Payment Systems, Designing Electronic Payment Systems.

Module 4 Electronic Data Interchange

EDI Application in Business, EDI-Legal, Security and Privacy Issues, EDI standardization, EDI Envelope for Message Transport, Internet based EDI, Internal Information System, Work-flow Automation and Coordination, Supply Chain Management, Document Library, Types of Digital Documents, Corporate Data Warehouses

Module 5 Recent Trends in E-Commerce

Multimedia in E-Commerce, Video Conferencing with Digital Videos, Broad Band Telecommunication, Frame & Cell Relays, Switched Multimegabit Data Service (SMDS), Asynchronous Transfer Mode, Mobile Computing and Wireless Computing.

Text Book

1. Frontiers of Electronic Commerce - Ravi Kalakota & Andrew B Whinston, Pearson Education Asia

References

1. Global Electronic Commerce – J Christopher Westland & Theodore H K Clark
2. E- Commerce The cutting edge of Business - Kamlesh K Bajaj & Debjani Nag
3. E-Commerce - Strategy, Technologies and Applications, TMH

ANALYSIS AND MODELING OF DIGITAL SYSTEMS (ELECTIVE - II) **RT805-4** **3+1+0**

Module1

Introduction to VHDL: Digital system design - Role of hardware description language- Modeling digital systems – events, propagation delays and concurrency – waveforms and timing – signal values – shared signals – simulation model – synthesis model – Field Programmable Gate Arrays.

Module 2

Basic language concepts simulation: signals – Entity architecture – concurrent statements – Constructing VHDL models using CSAs – delays.
Synthesis: Interface from declarations, simple CSA statements, conditional signal assignment statements, and selected signal assignment statements.

Module3

Modeling behavior Simulation: The process construct – programming constructs – the wait statement – attributes – generating clocks and periodic waveforms – using signals – modeling state machines – constructing VHDL models – programming errors.

Synthesis: language directed view – inference from within process – issues – signals vs. variables – latch vs. flip flop – the wait statement – state machine.

Module 4

Modeling structure: Describing structure – structural VHDL model – hierarchy, abstraction and accuracy – generics – component instantiation and synthesis – the generate statement subprograms: functions – procedures – sub program and operator overloading – packages and libraries.

Module 5

Basic I/O operations – the package TEXTIO – ASSERT statement – terminology and directory structure – simulation mechanics – synthesis mechanics – identifiers – data objects – data types – operators.

Text Book

1. Introductory VHDL - Sudhakar Yalamanchili, Pearson Education Asia.

References

1. VHDL primer - J Bhaskar, Pearson Education Asia
2. Analysis and modeling of digital systems - Zainalabedin Navabi, McGraw Hill.

DISTRIBUTED COMPUTING (ELECTIVE - II)

RT805-5

3+1+0

Module I Introduction

Introduction to Distributed Systems, evolution, characteristics, design issues, user requirements, Network technologies and protocols – overview, MACH, AMOBEA- overview.

Module 2 Distributed file system

File service components, design issues, interfaces, implementation techniques, Sun Network File System – architecture and implementation, other distributed file systems – AFS, CODA. Name services – SNS name service model.

Module 3 Communication in distributed systems

Client server communication, Group communication, Message passing – features, synchronizations, RPC – model, implementation, stub generation, messages, marshalling, Server management. Distributed shared memory – Architecture, design issues, structure of shared memory space, replacement strategy, thrashing. Synchronization – clock synchronization, event ordering, mutual exclusion

Module 4 Resource and Process management

Features of scheduling algorithms, Task assignment approach, load balancing, load sharing, Process migration mechanisms, Threads – scheduling.

Module 5 Consistency maintenance

Transaction recovery – methods- intention lists, Fault tolerance – failures, Byzantine failures.

Deadlocks in distributed systems – detection and prevention, centralized and distributed approaches.

References

1. Distributed Systems – Concepts and designing - George Coulouris, Jean Dellimore, Tim Kindberg - Pearson Education Asia
2. Distributed Operating Systems - Andrew S. Tenenbaum Pearson Education Asia
3. Distributed Operating Systems - Concepts and design - Pradeep. K, Sinha, PHI

USER INTERFACE DESIGN (ELECTIVE - II)

RT805-6

3+1+0

Module 1 Introduction

Importance of user interface – definition, importance of good design, brief history – Graphical User Interface – Web User Interface – Principles of User interface design.

Module 2 Design Process

Human Interaction with computers, Importance of Human Characteristics, Human consideration, Human Interaction speeds – Understanding Business function

Module 3 Screen Designing

Design goals - screen meaning and purpose, organizing screen elements- ordering of screen data and content – screen navigation and flow – visually pleasing composition – amount of information – focus and emphasis – presenting information simply and meaningfully – information retrieval on web – Statistical graphics – Technological considerations in Interface Design.

Module 4 Windows and components

Menus and navigation schemes, selection of windows, Selection of device based and screen based controls - text and messages – icons and images – Multimedia – colours- uses, problems, choosing colours.

Module 5 Software tools

Specification methods, interface building tools
Interaction devices: keyboard and function keys - pointing devices- speech recognition, digitization and generation – image and video displays – printers.

Text Book

1. The Essential Guide to User Interface Design 2nd Edn. – Wilbert O. Galitz, Wiley Dreamtech
2. Designing the User Interface 3rd Edn. – Ben Shneiderman, Pearson Education Asia

References

1. Human Computer Interaction – John M. Carroll, Pearson Education Asia
2. The Essentials of User Interface Design - Alan Cooper, Wiley Dreamtech

ELECTIVE - III

R806

3+1+0

List of electives

1. Multimedia Systems
2. Embedded Systems
3. Neural Networks
4. Genetic Algorithms and Applications
5. Advanced Networking Trends
6. Data Processing and Analysis Techniques
7. Biometrics

Note

New Electives may be added according to the needs of emerging fields in technology. The name of the elective and its syllabus should be submitted to the university before the course is offered.

MULTIMEDIA SYSTEMS (ELECTIVE - III)

R806-1

3+1+0

Module 1 Introduction

Definition of multimedia, multimedia, hardware, software applications and software environments - Media Types - Analog and digital video, digital audio, music and animation - Analog & Digital video - Memory storage - Basic tools - Authoring tools.

Module 2 Building Blocks

Text - Hyper text - Sound - Sound cards - Standards - Image - Image types - Image compression, RLE, JPEG, MPEG - Fractal and Wavelet Compressions - Image file types - Animation - Capture and Playback techniques. (basic ideas only)

Module 3 Multimedia Environments

The Compact Disc family, CD-interactive, Digital Video Interactive, QuickTime, Multimedia PC and Microsoft Multimedia Extensions.

Module 4 Multimedia Programming

Framework: Overview, Media classes, Transform classes, Format classes and Component classes - Problems related to programming - Composition, Synchronisation, Interaction, Database integration.

Module 5 Advanced Multimedia

Moving pictures - Techniques realistic image synthesis, Virtual Reality - Full motion digital video - Video capture techniques - multimedia networks - Desktop video conferencing - Future multimedia.

References

1. Multimedia Programming Objects, Environments & Framework - Simon J. Gibbs, Dionysios C. Tsischritziz (Addison-Wesley Publishing Co.)
2. Multimedia - Making it work - Tay Van Ghan – Osborne - Tata Mcgraw Hill
3. Authoring Interactive multimedia - Arch C Luther
4. Optimizing your Multimedia PC - L.J. Skibbe, Susan Lafe Meister - Comdex
5. Multimedia Bible - Winn L. Rosch, Sams
6. Multimedia Producers Bible - Ron Goldberg, Comdex
7. Multimedia Power Tools - Peter Jellam, Random house Electronic Pub.
8. Multimedia Computing - Mathew E. Hodger & Russel M. Sasnett, Addison wesley
9. Integrated Multimedia Systems Overview - Palikom, The communication Wall

EMBEDDED SYSTEMS (ELECTIVE - III)

RT806-2

3+1+0

Module1 Overview of Embedded System

Embedded System, Categories of Embedded System, Requirements of Embedded Systems, Challenges and Issues in Embedded Software Development, Applications of Embedded Systems in Consumer Electronics, Control System, Biomedical Systems, Handheld computers, Communication devices.

Module 2 Embedded Hardware & Software Development Environment

Hardware Architecture, Micro-Controller Architecture, Communication Interface Standards, Embedded System Development Process, Embedded Operating systems, Types of Embedded Operating systems.

Module 3 Embedded Communication System

Serial Communication, PC-to-PC Communication, Serial Communication with the 8051 Family of Micro-controllers, Protocol Converter, Voice-over-IP, Embedded Applications over Mobile Network example MP3 Sound Player.

Module 4 Real Time & Database Applications

Real-Time Embedded Software Development, Sending a Message over a Serial Link, Simulation of a Process Control System, Controlling an Appliance from the RTLinux System, Embedded Database Applications using examples like Salary Survey, Energy Meter Readings.

Module 5 Java Applications & Future Trends in Embedded Systems

Networked Java-Enabled Information Appliances, Embedded Process Control System, Mobile Java Applications, Appliance Control using Jini, System on a Chip (SOC), Smart Cards and the Cashless Society, Security in Embedded Systems.

Text Book

1. Programming for Embedded Systems- Dreamtech Software Team, Wiley
Dreamtech

Reference

1. Fundamentals of Embedded Software where C and Assembly Meet – Daniel W
Lewis.

NEURAL NETWORKS (ELECTIVE - III)

RT806-3

3+1+0

Module 1

Introduction - Principles - artificial neuron - activation functions - Single layer & multilayer networks - Training artificial neural networks - Perception - Representation - Linear separability - Learning - Training algorithms.

Module 2

Back Propagation - Training algorithm - Applications - network configurations - Network paralysis - Local minima - temporal instability.

Module 3

Counter Propagation networks: Kebeenon layer - Training the cohenen layer - Pre initialising the wright vectors - statistical properties - Training the Grosbery layer - Full counter propagation network - Application.

Module 4

Statistical methods - Boltzmann's Training - Cauche training - Artificial specific heat methods - Applications to general non-linear optimization problems.

Module 5

Hopfield nets - Recurrent networks - stability - Associative memory - applications - Thermo dynamic systems - Statistical Hopfield networks - Bidirectional associative memories - Continous BAM - Adaptive resonance theory - Architecture classification - Implimentation.

Text Book

1. Neural Computing Theory & Practice - Philip D. Wasserman.

References

1. Neural Networks - Simon Haykins
2. Adaptive Pattern Recognition & Neural Networks - Pay Y.H.
3. An Introduction to neural computing - Chapman & Hall
4. Artificial Neural Networks - Robert J. Schalkoff, McGraw Hill
5. Artificial Neural Networks - B.Yegnanarayana, PHI

GENETIC ALGORITHMS AND APPLICATIONS (ELECTIVE - III)

RT806-4

3+1+0

Module 1 Architecture-Altering Operations

Introduction, Previous Methods of Determining the Architecture of a Multi-Part Program - On the origin of new function- Architecture-Altering operations for

Subroutines -Automatically Defined Iterations, Loops, Recursion, Storage. Self-Organization of Hierarchies and Program Architecture - Rotating the Tires on an Automobile – Boolean Parity Problem- Time-Optimal Robot Control Problem - Multi-Agent Problem - Using Architecture Altering Operations for Subroutines. Transmembrane Segment Identification Problem using Architecture-Altering Operations for Iterations-Fibonacci Sequence- Cart Centering.

Module 2 Genetic Programming Problem Solver (GPPS)

Elements of GPPS 1.0-Problems Illustrating GPPS 1.0 - Elements of GPPS 2.0 - Problems Illustrating GPPS 2.0 - Previous Work on Automated Analog Circuit Synthesis.

Module 3 Automated synthesis of analog electrical circuits

Synthesis of a Low-pass Filter and High-pass Filter The Role of Crossover in Genetic Programming.

Module 4 Evolvable Hardware

Evolvable Hardware and Rapidly Re-configurable Field-Programmable Gate Arrays

Discovery of cellular Automata Rules: Discovery of a Cellular Automata Rule for the Majority Classification Problem.

Module 5 Programmatic Motifs for molecular Biology

Automatic Discovery of Protein Motifs –Programmatic Motifs and the Cellular Location Problem.

Parallelization and Implementation Issues: Computer Time- Parallelisation of Genetic Programming –Implementation Issues.

Text Book

1. John R. Koza, Forrest H Bennett III, David Andre, Martin A. Kean, “ Genetic Programming III: Darwinian Invention and Problem Solving”, Morgan Kaufmann, 1999

Reference

1. Genetic Algorithms for VLSI Design, Layout and test Automation - Pinaki Mazumder, Elizabeth M Rudnick (Pearson Education Asia)

ADVANCED NETWORKING TRENDS (ELECTIVE - III)

RT806-5

3+1+0

Module 1

Ethernet Technology – Frame format – Interface Gap – CSMA/CD – 10 mbps Ethernet, Fast Ethernet, Gigabit Ethernet, Wireless Ethernet – SONET – Sonet multiplexing, Sonet frame structure

Module 2

ISDN - Definition - Protocol architecture - System architecture - Transmission channels - ISDN interface, B-ISDN.

Module 3

ATM – ATM Principles – BISDN reference model – ATM layers – ATM adaption Layer – AAL1, AAL2, AAL3/4, AAL5 – ATM addressing – UNI Signaling – PNNI Signalling

Module 4

SATELLITE COMMUNICATION: Satellite communication principles - Geo stationary satellites - block schematic of satellite earth station - VSAT - VSAT networks - applications in personnel communication. (basic ideas only)

Module 5

Wireless Lan – Infrared Vs Radio transmission – Infrastructure & ad hoc n/w – IEEE 802.11 – Hiper Law – Bluetooth – Physical Layer – MAC layer – Networking – Security

References

Module 1

1. An introduction to Computer Networking - Kenneth C Mansfield, Jr., James L. Antonakos, PHI

Module 1,2,3

1. Communication Networks Fundamental Concepts & Key Architecture - Leon-Garcia – Widjaja, Tata McGraw Hill
2. Mobile Communication - Jochen Schiller, Pearson Education Asia

DATA PROCESSING AND ANALYSIS TECHNIQUES (ELECTIVE - III)

RT806-6

3+1+0

Module 1

Introduction to COBOL programming -elements of COBOL divisions, sections and paragraphs -Table writing - complete program in COBOL using various options verbs, statements- conditional statements.

Module 2

Table Handling – Occur clause – PERFORM verb – SET verb, SEARCH verb – Occurs depending clause – Sorting a Table.

Module 3

Processing of various file structures in COBOL Language – File description – Fixed Length Record – Statements – Sequential File with variable length record – Sorting and merging of files – Direct access files.

Module 4

Data warehousing – Definition – Multidimensional datamodel – OLAP operation – Data warehouse architecture – Warehouse Server – Metadata – OLAP Engine.

Module 5

Data mining – Definitions, KDD Vs Data mining, DBMS Vs DM – DM Techniques, Issues and Challenges in DM – DM application areas.

References

1. COBOL programming - M K Roy & D Ghosh Dastidar, Tata McGraw Hill
2. Data mining Techniques - Arun K Pujari (Universal Press)
3. Data mining Concepts and Techniques - Jawei Han & Micheline Kamber (Morgan Kaufmann Pub.)
4. Data Mining - Pieter Adriaans, Dolf Zantinge, Person Education Asia
5. Structured COBOL Programming - E. Rajasekar & S.Selvi (Anuradha Agencies)
6. Structured COBOL- A. S. Philippakis & Leonard, J. Kazmier (Tata McGraw Hill)

BIOMETRICS (ELECTIVE -III)

RT806-7

3+1+0

Module 1

Introduction – Benefits of biometric security – verification and identification – basic working of biometric matching – accuracy – false match rate – false nonmatch rate – failure to enroll rate – derived metrics – layered biometric solutions

Module 2

Finger scan – features – components – operation (steps) – competing finger scan technologies – strength and weakness

Facial scan - features – components – operation (steps) – competing facial scan technologies – strength and weakness

Module 3

Iris scan - features – components – operation (steps) – competing iris scan technologies – strength and weakness

Voice scan - features – components – operation (steps) – competing facial scan technologies – strength and weakness

Module 4

Other physiological biometrics-Handscan-retina scan- AFIS (automatic fingerprint Identification systems)-Behavioral Biometrics-Signature scan-Key stroke Scan.

Module 5

Biometrics Application – Biometric Solution Matrix-Bioprivacy-Comparison of privacy factor in different biometrics technologies-Designing privacy sympathetic biometric systems-Biometric standards- (BioAPI, BAPI)-Biometric middleware.

Reference

1. Biometrics -Identify Verification in a Networked World - Samir Nanavati, Michael Thieme, Raj Nanavati- WILEY-dreamtech

GRAPHICS AND MULTIMEDIA LAB

R807

0+0+4

Point plotting, line and circle drawing, Line and Polygon clipping, transformations, hidden line elimination, curves, polygon hatching, Multimedia programming, Visual programming, Animation

Any experiment according to the syllabus of R702 Computer Graphics may be substituted

PROJECT & SEMINAR

R709/ R808

0+0+4

Each student is required to present a technical paper on subject approved by the department. The paper should in general reflect the state of the art. He/ She submits a report of the paper to the department.

In addition to the seminar He/She shall undertake a project work in the 7th semester itself in consultation with the guide(s). On completion of the project work, He/She shall present the work done before a panel of staff members, and submit a report of the project work done to the department.

VIVA -VOCE

R809

A comprehensive Viva-voce examination will be conducted to assess the students overall knowledge in the specified field of engineering. At the time of Viva-voce, certified report of seminar, mini project and project work are to be presented for evaluation.

