M.Sc. COMPUTER SCIENCE SEMESTER - III

(w.e.f. the academic year 2010-2011)

CS-301T
ARTIFICIAL INTELLIGENCE

4 Hr. per week

UNIT-I

Artificial Intelligence-Definition, introduction to Al techniques Problems Problem spaces and search - State space search problem - production system - problem characteristics - Heuristic search – Generate and test, Hill climbing – Breadth First search, problem reduction, Constraint satisfaction knowledge representation issues – representation and mapping approaches – issues - the frame problem - knowledge representation using predicate logic - predicate logic, unification, resolution.

UNIT-II

Procedural versus declarative knowledge - Logic programming-Forward versus backward reasoning - matching declarative knowledge representation - Semantic Nets-Frames-Conceptual dependency Scripts, CYC. Symbolic reasoning under uncertainty - Non-monotonic reasoning - logic for non-monotonic reasoning – Implementation of depth-First search and Breadth first search, Statistical reasoning, Certainty Factors and rule based systems-Bayesian Networks – Dempster Shafer Theory – Fuzzy logic.

UNIT-III

Game playing - minimax search - alpha, beta heuristics-refinement - iterative deepening planning-Components-Goal stack planning - Nonlinear planning – hierarchical planning – Learning - Rote learning – Learning by taking advice – Learning from examples, explain based learning – connectist models – Neural networks, applications - Natural Language processing, syntax, Semantic and pragmatic processing perception. Expert System Representation and using domain knowledge – Expert system shells – Explanation - Knowledge acquisitions.

UNIT-IV

The Brain as a dynamical system, Neurons as functions, signal monotonicity, Biological activations and signals, Neuron fields. Theory of Fuzzy sets; Definition dilation, concentration, normalization, reasoning with fuzzy logic, natural language computations, Fuzzy Machine algorithms.

TEXT BOOKS:

1. W.F. Clocksin and C. S. Mellish, Programming in PROLOG, Springer International Student Edition.
2. Dan. W. Patterson, Introduction to Artificial Intelligence and Expert System, Prentice Hall of India.

REFERENCE BOOK:

1. Artificial Intelligence by Elaine Rich, Mc Graw Hill Book Company.

CS-302T
OBJECT ORIENTED SYSTEM DEVELOPMENT WITH UML

4 Hr. per week

UNIT I

Introduction: An Overview of Object-Oriented system development, Object Oriented Methodologies, Object Oriented systems development life cycle, Object Basics, Importance of modelling, Object Oriented Modelling, An overview of the UML, A Conceptual Model of the UML, Software Development life cycle, Building blocks of the UML, Rules of the UML, Common Mechanisms, UML Architecture.

UNIT II

Structural modelling: Classes, Relationships, Common Mechanisms, Diagrams, Class Diagrams, Advanced Structural Modelling: Advanced Classes, Advanced Relationships, Interfaces, Types, Roles, Packages, Instances, Object Diagrams.

UNIT III

Behavioural modelling: Interactions, Use Cases, Use Case Diagrams, Interaction Diagrams, Activity Diagrams, Advanced Behavioural Modeling: Events and Signals, State Machines, Processes and Threads, Time and Space, Space Chart Diagrams.

UNIT IV

Architectural Modelling: Components, Deployment, Collaborations, Patterns, and Frame works, Component Diagrams, Deployment Diagrams, Systems, and Models.

TEXT BOOKS:

1. Ali Bahrami, “Object Oriented Systems Development”, McGraw-Hill International Editions, 1999.
2. Grady Booch, James Rumbaugh, Ivar Jacobson, “The Unified Modeling Language-User Guide”, Pearson Education, Addison-Wesley, 1999.

CS-303T
NETWORK SECURITY

4 Hr. per week

Unit-I

Conventional encryption, Security attacks, Security, Model for network security, conventional encryption model, encryption techniques, DES, Triple DES, key distribution, random number generation.

Unit-II

Public – key cryptology, principles of public – key cryptosystems, RSA algorithm, key management, distribution of public keys, public key – distribution of secret keys.

Unit-III

Authentication and digital systems, authenticate requirements – functions cryptographic checksum, hash function, digital signatures authentication protocols, Kerberos, X-509 directory, authentication services Diffie – Hellmann key exchange, digital signature standards.

Unit-IV

Cryptographic algorithms, The MD 5 message digest algorithm, Secure Hash algorithm, international data encryption algorithm, LUCA public key encryption – Electronic mail and management security – pretty good privacy (PGP), privacy enhanced mail.

TEXT BOOKS:

1. William Stallings, Network and Internet work Security, Prentice Hall of India.

CS-304AT
(A) NEURAL NETWORKS AND FUZZY LOGIC (ELECTIVE)

4 Hr. per week

UNIT-I: Introduction – Knowledge – based information processing – Neutral and fuzzy machine intelligence – Fuzziness as multivalance – Dynamical system approach to machine intelligence – The Brain as a dynamical system – Intelligent behaviors as adaptive model free estimation (pages 2-32).

UNIT-II: Neuronal Dynamics – activation of signals – Neurons as function – Biological activation and signals – Neuron fields – Neuron dynamical system, common signal function plug-coded signal function (pages 39-50).

Activation Models Neuronal dynamical, system – additive neuronal dynamics – additive neuronal feedback – additive activation and Bivalent model (pages 55-73).

UNIT-III: Learning: Supervised and unsupervised statistical learning – Al learning – Neural network learning Back propagation algorithm and derivation – stopping criteria complexity of learning generalization (pages 111-127 and 180-212).

UNIT-IV: Fuzzy Logic: Fuzzy sets and system – Universe as Fuzzy sets – Geometry of Fuzzy sets (pages 263, 268-274). Fuzzy and neural function estimation (pages 302-207), Fuzzy and Meta-Model controllers – Real line target tracking – Fuzzy controller – Fuzzy and Kalman – Filter controller surfaces (pages 379-394).

Hopfield Networks: The Hopfield model – Hopfield network algorithm. Bollizman's machine algorithm – Neural network and fuzzy system application (pages 92, 253-255).

TEXT BOOK:

1. Bart Kosko, Neural Networks of Fuzzy Structures, Prentice Hall of India, 1994.

REFERENCE BOOKS:

1. Limin Fr. Neural Networks in Computer Intelligence, McGraw Hill Publications Company, 1995.
2. James A. Freeman, Similarity Neural Networks, Addison Wesley Publications Company, 1995.

CS-304BT
(B) IMAGE PROCESSING (ELECTIVE)

4 Hr. per week

UNIT-I

Image formation and description – Digital image representation – Elements of Visual perception – Sampling and quantisation – Elements of digital image processing systems. (pages 1-16 and 21-45).

UNIT-II

Image transforms, Digital Image transforms – Fourier transform – Extension to 2D. DCT Walsh, Hadamard Transforms (pages 81 – 143).

UNIT-III

Image Enhancements and Segmentation – Histograms modification – Image smoothing – Image sharpening – Thresholding – Edge detection – Segmentation Point and region dependent techniques (pages 162, 187, 413 – 423 and 443 – 445). Color Image Processing: Color fundamentals, color models psuedo – Color image processing – intensity slicing gray level to color transformation, filtering approach, full – Color image processing (pages 221-248).

UNIT IV

Image encoding – fidelity criteria – Transform compression – K. L. Fourier, DCT, Spatial compression run length coding – Huffman coding – Contour Coding restoration – Restoration models, Inverse filtering – Least Squares Filtering – Recursive Filtering. (pages 307 – 315, 343 – 358, 331 – 339, 148 – 150, 189 – 209, 207 – 280).

TEXT BOOK:

Gonzalez R.C., Woods R. E. Digital Image Procesing, Addison Wesley, 1992.

REFERENCE BOOKS:

1. Rosenfeld A, Kak A.C., Digital Picture Processing, Vol. I & II, Academic Press, (Second Edition) 1982.
2. Fundamentals of Digital Image Processing, Anil K. Jain, Prentice – Hall of India Pvt. Ltd., New Delhi.

CS-304CT

(C) PARALLEL PROGRAMMING (ELECTIVE)

4 Hr. per week

UNIT-I: Introduction to Parallel Computing – Motivation, Scope, Parallel Programming Platforms – Implicit parallelism, limitations of memory system performance, dichotomy, physical organization, communication costs, principles of parallel algorithm design – preliminaries, decomposition techniques, (Pages 1-109).

UNIT-II: Tasks and interaction, mapping techniques for load balancing, methods for containing interaction overheads, parallel algorithm models. Basic communication operations – one to all broadcast and all to one reduction and all to all broadcast and reduction, scatter and gather. Analytical modeling of parallel programs – performance metrics, effect of granularity, scalability. (Pages 110-228).

UNIT-III: Programming using message passing – building blocks, message passing interface (MPI), Topology and embedding, non-blocking communication operations, collective communication and computation operations. Programming shared address space – threads, synchronization, controlling threads, read-write locks, barriers, OpenMP. (Pages 233-331).

UNIT-IV: Dense matrix algorithms – matrix vector multiplication, matrix-matrix multiplication, solving a system of linear equations. Sorting algorithms – issues, sorting networks, bubble sort, quick sort. Fast – fourier transform - serial algorithm, binary exchange algorithm, transpose algorithm (Pages 337-416, 538-560).

TEXT BOOKS:

1. Anantha Grama, Anshul Gupta, George Karypis, Vipin Kumar – Introduction to parallel computing, second edition, pearson 2003.

REFERENCE BOOKS:

2. Gregory V. Wilson, Practical Programming, PHI, 1998.
3. Michael J. Quinn, Parallel Programming in C with MPI and OpenMP, Tata McGraw Hill.

CS-305T

INTER DISCIPLINARY PAPER-I

FUNDAMENTAL OF INFORMATION TECHNOLOGY
OBJECTIVE: TO IMPART BASIC KNOWLEDGE ABOUT COMPUTERS.

UNIT – I: **4 Hr. per week**

INFORMATION TECHNOLOGY –INTRODUCTION - INFORMATION SYSTEM, COMPUTER SOFTWARE AND DATA-IT IN BUSINESS AND INDUSTRY, IT IN HOME AND PLAY –IT IN EDUCATION AND TRAINING –IT IN ENTERTAINMENT AND ARTS- IT IN SCIENCE, ENGINEERING AND MATH-GPS, APPLICATIONS.

THE COMPUTER SYSTEM AND CPU-TYPES OF COMPUTERS, CORPORATE AND DEPARTMENTAL COMPUTERS- DESK TOP AND PERSONAL COMPUTERS THE FOUNDATION OF MODERN INFORMATION TECHNOLOGY –BINARY NUMBERS ,DIGITAL SIGNALS, MOORE'S LAW, BITS AND BYTES, THE BINARY CODE,CPU,THE MICRO PROCESSOR, THE PART OF PROGRESS, MEMORY :ROM,RAM,VIERTUAL MEMORY ,CACHES, BUFFERS, MACHINE CYCLE, REGISTERS-BUSES FOR INPUT AND OUT PUT,ADPTER CARDS, AND MULTI MEDIA SYSTEMS, COMPUTER PORTS UNIVERSAL SERIAL BUS (USB) AND FIRE WIRE INPUT AND OUT PUT DEVICES-KEY BOARDS,OCR BAR CODES, SPEECH RECOGNITION-GRAPHICS, SCANNERS DIGITIZING PHOTOS AND VIDEO-POINTING DEVICES-PIXELS AND RESOLUTIONS-FONTS, THE RANGE OF COLOR DISPLAY SCREENS, TYPES RESOLUTION-PRINTERS LASER DOT MATRIX, LINE AND PHOTO PRINTERS – COLOR PRINTERS-INKJET, THERMAL WAX.

UNIT – II:

SECONDARY STORAGE, STORAGE DEVICES AND MEDIA, STORAGE CHARACTERISTICS, TRACKS, AND SECTORS,-STORAGE MEDIA, FLOPPY DISKS, HDD, OPTICAL DISKS, INCREASING DATA STORAGE CAPACITY, BACK UP-THE SMART CARD.

THE SOFTWARE –INTRODUCTION, -O.S,- APPLICATION PROGRAMS-USER INTERFACE –OS- TYPES, FILE MANAGEMENTS, UTILITES -DOCUMENT – CENTRIC COMPUTING ,OBJECT LINKING AND EMBEDDING (OLE)-MAJOR SOFTWARE ISSUES-NETWORK COMPUTING.

WORD PROCESSING –DESKTOP PUBLISHING –ENTERING AND EDITING DOCUMENTS-WORD PROCESSING FEATURES –FORMATTING DOCUMENTS-DESK TOP PUBLISHING FOR PRINT AND FOR THE SCREEN .

UNIT-III:

SPEARED SHEET AND DATA BASE APPLICATIONS:-ENTERING DATA, CHARTS, GRAPHS-DATA BASE APPLICATIONS, PRINCIPLES OF DATA STORAGE, WORKING WITH DATA BASE, FORMS, QUERIES, CREATING QUERIES, USING RELATIONAL AND LOGICAL OPERATORS –INTERNET CONNECTIVITY THE INTERNET AND WWW-HOME PAGE –THE WEB, THE WEB SITE –GETTING CONNECTED TO THE WEB –BROWSING –LOCATING THE INFORMATION ON THE WEB –WEB MULTIMEDIA.THE COMMUNICATIONS –THE ELECTRONIC WEB -THE NET WORK APPLICATIONS –FAX, VOICE AND INFORMATION SERVICES- PERSON TO PERSON COMMUNICATION –GROUP COMMUNICATIONS-EXCHANGE FILES –THE FOUNDATIONS OF MODERN NETWORKS BAND WITH, LOCAL AREA NETWORKS, ARCHITECTURE –RING , STAN AND BUS ARCHITECTURE ,WIRELESS LANS –ETHERNET ,TOKEN –WIDE AREA NETWORKS ,INTRODUCTION – LINKS BETWEEN NETWORKS –DEVICES AND MEDIA –PROTOCOLS –NETWORKS ,DIALUP ACCESS ,MODEMS

UNIT-IV:

MULTIMEDIA-INTRODUCTION, PAINT, DRAW APPLICATIONS –THE TOOLS OF MULTIMEDIA, GRAPHIC EFFECTS AND TECHNIQUES, SOUNDS AND MUSIC, VIDEO, AUTHORING TOOLS, PRESENTATION DEVICES-MULTI MEDIA ON THE WEB, SOUND AND MOTION, VIDEO AND TELEVISION PROGRAMMING AND THE SYSTEM DEVELOPMENT –PROGRAMS AN INTRODUCTION –PROGRAMMING LANGUAGES- FIRST AND SECOND GENERATIONS, PROCEDURAL LANGUAGES-PROGRAMMING METHODS, DATA STRUCTURE AND ALGORITHM OBJECT ORIENTED PROGRAMMING –DEVELOPMENT OF PROGRAMS –INTRODUCTORY PROGRAMMING TECHNIQUES, BRANCHING AND LOOPING, FUNCTION AND DECOMPOSITION –SYSTEM ANALYSIS AND DESIGN PERSONAL ,SOCIAL AND ETHICAL ISSUES –COMPUTERS AND HEALTH ,ETHICS, VIRUSES -INTELLECTUAL PROPERTY RIGHTS –COMPUTER CRIME –CRYPTOGRAPHY ,PUBLIC KEY CRYPTOGRAPHY ,SIGNATURES ,BURNING ISSUES –NATIONAL IDENTITY NUMBERS ,THE

ELECTRONIC SUPER VISOR , CENSORSHIP AND FREE SPEECH ,PRIVACY IN COMMUNICATIONS ,SOURCES TO FOLLOW .

BOOKS:

1. DENIES P. CURTIN, HOLLY SEN- INFORMATION TECHNOLOGY THE BREAKING WAVE, TMH PUBLISHING COMPANY 18TH REPRINT, 2006.
2. DEMORAH MARLEY, CHARLES S. PARKER- UNDERSTANDING COMPUTERS TODAY AND TOMORROW THOMSON COURSE TECHNOLOGY, (THOMASON LEARNING) 11TH EDITION 2007.
3. INTRODUCTIONS TO COMPUTERS- PETER NORTON, TMH PUBLISHING COMPANY 8TH VERSION, 2008.
4. WILLIAMES, SAW YER AND HUTCHINSON;USING INFORMATION TECHNOLOGY, INTRODUCTION TO COMPUTERS AND COMMUNICATIONS, TMH, NEW DELHI. 2000.

CS-306P

LAB – (SYSTEM SECURITY)

6 Hr. per week

Network Security Practicals
Implementation of these algorithms using Java or C/C++

A. Encryption Techniques:
- Polyalphabetic ciphers
- Transposition techniques
- Hill ciphers
- Playfair ciphers
- Monoalphabetic ciphers
- DES (Data Encryption Standard) Encryption
- Double DES
- Triple DES

B. Public Key Cryptography using RSA
- Key Generation
- Encryption & Decryption Techniques
- Diffie – Hellman Key Exchange
- Hash Function
- Kerberos (Client & Server) in Network
- MD5 (Message Digest Algorithm)
- Secure Hash Algorithm (SHA)
- Pretty Good Privacy (PGP)
- Authentication
- Confidentiality
- Cipher block chaining mode (CBC)
- Electronic codebook mode (ECB)
- Cipher feedback mode
- Digital Signature Algorithms
- Message Authentication code
- Hash Message Authentication Code
- Secure Multipurpose Internet mail Extension (S/MIME)
- Enveloped data
- Signed Data
- Clear Signing
- Internet Data Encryption Algorithms
- Encryption
- Decryption

C. Firewall Installation & Configuration on Networking OS such as Linux Server System

CS-307P
LAB (CASE TOOLS (UML))

6 Hr. per week

The student is expected to take up at least five mini-projects and model them and produce Class, Use Case, Component, Deployment, Interaction, Sequence diagrams and State Charts, Analysis Documents – both static and dynamic aspects, Database Design. A sample collection of projects is given below. The instructor is advised to add few more projects.

Project I: Online BookShop Example

Following the model of amazon.com or bn.com, design and implement an online bookstore.

Project II: A Simulated Company

Simulate a small manufacturing company. The resulting application will enable the user to take out a loan, purchase a machine, and over a series of monthly production runs, follow the performance of their company.

Project III: An Auction Application

Several commerce models exist and are the basis for a number of companies like eBay.com, priceline.com etc. Design and implement an auction application that provides auctioning services. It should clearly model the various auctioneers, the bidding process, auctioning etc.

Project IV: Multi-Threaded Airport Simulation

Simulate the operations in an airport. Your application should support multiple aircrafts using several runways and gates avoiding collisions/conflicts.
Landing: an aircraft uses the runway, lands, and then taxis over to the terminal.
Take-off: an aircraft taxies to the runaway and then takes off.

Project V: A Notes and File Management System

In the course of one's student years and professional career one produces a lot of personal notes and documents. All these documents are usually kept on papers or individual files on the computer. Either way the bulk of the information is often erased corrupted and eventually lost. The goal of this project is to build a distributed software application that addresses this problem. The system will provide an interface to create, organize and manage personal notes through the Internet for multiple users. The system will also allow users to collaborate by assigning permissions for multiple users to view and edit notes.

Project VI: A Point-of-Sale (POS) System

A POS system is a computerized application used to record sales and handle payments. It is typically used in a retail store. It includes hardware components such as a computer and bar code scanner, and software to run the system. It interfaces to various service applications, such as a third-party tax calculator and inventory control. These systems must be relatively fault tolerant; that is, even if remote services are temporarily unavailable they must still be capturing sales and handling at least cash payments. A POS system must support multiple and varied client-side terminals and interfaces such as browser, PDAs, touch screens.

Project VII: A Customisable Program Editor

A programmer's editor which will be focussed on an individual programmer's particular needs and style. The editor will act according to the specific language the current source file is in, and will perform numerous features, such as auto-completion or file summarization, on the file. These features will be able to be turned on or off by the programmer, and the programming style of the user will be used to create as efficient an editing environment as possible.

Project VIII: A Content Management System

The goal is to enable non-technical end users to publish, access and share information over the web, while giving administrators and managers complete control over the presentation, style, security, and permissions.

Features:
Robust permissions system
Templates for easy custom site designs
Total control over the content
Search engine friendly URL's
Role based publishing system
Versioning control
Visitor profiling

Project IX: A Graphics Editor

Design and implement a java class collection that supports the construction of graph editing applications, i.e., applications that include the ability to draw structured and unstructured diagrams.

E.g.: The goal of this project is to build a graph-editing library that can be used to construct many, high quality editing applications. Some of this project's features are:
A simple concrete design that makes the framework easy to understand and extend.

Node-Port-Edge graph model that is powerful enough for the vast majority of connected graph applications.
Model-View-Controller design based on the Swing Java UI library makes this application able to act as UI to existing data structures, and also minimizing learning time for developers familiar with swing.
High quality user interactions for moving, resizing, reshaping, etc. This application also supports several novel interactions such as the broom alignment tool and section-action-buttons.
Generic properties sheet based on Java Beans introspection.
XML-based file formats based on PGML standard.

Project X: An Automated Community Portal

Business in the 21st century is above all BUSY. Distractions are everywhere. The current crop of "Enterprise Intranet Portals" is often high noise and low value, despite the large capital expenditures it takes to stand them up. Email takes up 30-70% of an employee's time. Chat and Instant Messaging are either in the enterprise or just around the corner. Meanwhile, management is tasked with unforeseen and unfounded leadership and change-agent roles, as well as leadership development and succession management.

What is needed is a simplified, repeatable process that enhances communications within an enterprise, while allowing management and peers to self select future leaders and easily recognize high performance team members in a dynamic way.

Additionally, the system should function as a general-purpose content management, business intelligence and peer-review application.

Our goal is to build that system. The software is released under a proprietary license, and will have the following features:

Remote, unattended moderation of discussions.

However, it will have powerful discovery and business intelligence features, and be infinitely extendable, owing to a powerful API and adherence to Java platform standards.Encourages peer review and indicates for management potential leaders, strong team players and reinforces enterprise and team goals seamlessly and with zero administration.

M.SC. COMPUTER SCIENCE SEMESTER – IV

CS-401T

DATA WAREHOUSING AND DATA MINING

4 Hr. per week

UNIT-I: Basic elements of Data Warehouse, Dimensional Modelling: Introduction, Data Warehouse Bus Architecture, Dimensional Modelling Techniques, Extended Dimensional Table Design, Extended Fact Table Designs, Advanced ROLAP querying and reporting, Building Dimensional Models. Data Warehouse Architecture: Architectural Framework and Approach, Technical Architecture.

UNIT-II: Back Room Technical Architecture: Back Room data stores, Back Room services, Asset Management. Front Room Architecture: Front Room data stores, Front Room services for Data access. Aggregates: Aggregation goals and risks, Design goals for Aggregate Navigation System, Navigation algorithm, Physical Design: Develop standards, Physical Data Model, Initial Index Plan, Database Instance, Physical Storage Structure, Usage monitoring, Data Staging: Dimension Table Staging, Fact Table loads and Warehouse operations.

UNIT-III: Data mining – Introduction, definitions, KDD, Data Mining Techniques, Problems, Issues, Challenges, Applications - Association Rules – Introduction, Methods – Apriori, Partition. Pincer-Search, dynamic itemset counting, FP-tree growth, incremental, Border algorithms, Clustering Techniques – Introduction, algorithms.

UNIT-IV: Decision trees – Introduction, Best Split, Splitting indices and criteria, Decision tree construction algorithms, Pruning techniques. Neural Networks – Introduction, learning, unsupervised learning, Temporal Mining – Introduction, temporal association rules, sequence-mining, algorithms, episode discovery, event prediction, Time-Series analysis, Spatial Mining – Tasks, clustering, trends.

TEXT BOOKS:

1. Ralph Kimball, Laura Reeves, Margy Ross, Warren Thornthwaite – The Data Warehouse - Life Cycle tool kit, Wiley 1998.
2. Arun K. Pujari – Data Mining Techniques, University Press 2001.

CS-402T

MOBILE COMPUTING

4 Hr. per week

UNIT – I

Introduction: Applications, Wireless Transmission: Frequencies of radio transmission, Signals, Antennas, Signal Propagation, Multiplexing, Modulation, Spread Spectrum, Cellular System, Media access control: Motivation for a specialized MAC, SDMA, FDMA, TDMA, CDMA, Comparisons.

UNIT – II

Wireless LAN: Infrared vs. radio transmission, Infrastructure and ad-hoc networks, IEEE 802.11, HIPERLAN, Blue tooth, Wireless ATM: WATM services, Reference model, Functions, Radio access layer, Handover, Location management, Addressing, Access point control protocol.

UNIT – III

Mobile network layer: Mobile IP, Dynamic host configuration protocol, Ad hoc networks, Mobile transport layer: indirect TCP, snooping TCP, mobile TCP, fast transmit / fast recovery, transmission / timeout freezing, selective re-transmission, transaction oriented TCP.

UNIT-IV

Wireless Application Protocol: WAP Architecture, Components of WAP standards, Design principles, Wireless Markup Language (WML), WML basics, Events, Tasks and Bindings.

TEXT BOOKS:

1. Jochen M. Schiller, Mobile Communications, Pearson Education, 2000.
2. The Wireless Application Protocol, Pearson Education, 2001

CS-403T

INTER DISCIPLINARY PAPER-II
COMPUTATIONAL TECHNIQUES

OBJECTIVE: TO IMPART BASIC KNOWLEDGE OF DIFFERENT TECHNIQUES USING ALGORITHM.

UNIT – I:

SIMULTANEOUS LINEAR ALGEBRAIC EQUATIONS: INTRODUCTION, GAUSS'S METHOD FOR THE SOLUTION OF A SYSTEM OF LINEAR EQUATION BY SUCCESSIVE ELIMINATION, GAUSS- JORDAN REDUCTION METHOD OF SOLVING AX = B, THE GAUSS- SEIDEL METHOD; METHOD OF RELAXATION;THE IMPLEMENTATION OF THEM THROUGH ALGORITHMS.

UNIT-II:

NUMERICAL ROOTS OF POLYNOMIALS AND TRANSCENDENTAL EQUATIONS IN ONE VARIABLE. INTRODUCTION, POLYNOMIAL, SYNTHETIC DEVISION BY A LINEAR EXPRESSION, SYNTHETIC DEVISION FOR EVALUATION OF $P_N(X_0)$ AND DERIVTIVE OF A POLYNOMIAL METHODS OF SOLVING TRANSCENDENTAL EQUATIONS, GRAPHICAL METHOD, BISECTION METHOD, METHOD OF FALSE POSITION, NEWTON-RAPHSON METHOD FOR NON-REPEATED REAL ROOTS.

UNIT – III:

STATISTICAL METHODS AND INTERPOLATIONS: CURVE FITTING BY METHOD OF LINEAR SQUARES, CORRELATION AND REGRESSION, LINES OF REGRESSION. TEST OF SIGNIFICANCE. CHI- SQUARE, F AND T-TESTS AND INTERPOLATION USING SYMMETRIC DIFFERENCE ONLY.

UNIT-IV:

NUMERICAL DIFFERENTIATION AND INTEGRATION: INTRODUCTION, APPROXIMATE EXPRESSION FOR THE DERIVATIVE OF A FUNCTION; UN SYMMETRIC EXPRESSION FOR THE THIRD DERIVATIVE NUMERICAL INTEGRATION: INTRODUCTION A GENERAL QUADRATURE FORMULA FOR EQUIDISTANT ORDINATES, THE TRAPEZOIDAL RULE, SIMPSON'S $\frac{1}{3}$RD RULE, SIMPSON'S $\frac{3}{8}$TH RULE.

BOOKS:

[1] FINITE DIFFERENCES AND NUMERICAL ANALYSIS: H.C. SAXENA 5TH EDITION, 2007, S. CHAND & COMPANY LTD.

[2] FUNDAMENTALS OF MATHEMATICAL STATISTICS, S.C. GUPTA AND V.K. KAPOOR; S. CHAND & SONS 20TH EDITION JUNE 2008.

[3] NUMERICAL METHODS FOR SCIENTIFIC AND ENGINEERING COMPUTATION: M.K. JAIN, SRK. IYENGAR, R.K.JAIN 5TH EDITION; NEW AGE INTERNATIONAL (P)LIMITED PUBLISHERS JUNE 2007.