



## CS 401 : Web Technology

**Web Programming :** Concept of JDBC (Java Database Connectivity), Working with SQL, Stored Procedure, Security in Java, Class Loader, Byte Code Verification, Security Manager and Permission, Digital Signatures, Code Signing, Encryption

**Introduction to J2EE:** Its advantage, Enterprise Architecture Types, Understanding EJB, its architecture, EJB Roles, Benefits and limitations of Enterprise Beans, Session Beans: Stateful and Stateless Beans, Entity Beans, Beans Managed Persistence, Container Managed Persistence.

**Advanced Web Technology in J2EE:** Understanding Directory Services and JNDI, Introduction to LDAP, LDAP Operation, Working with LDAP Server, Introduction to Web Containers and Web Applications, Introduction to HTTP Protocol, Web Application Life Cycle.

**Creating Web Applications:** Understanding Servlet programming, Its life cycle, Servlet Configuration, Understanding Servlet sessions, Understanding of JSP and JSTL, JSP documents, Elements, tag extensions, tag libraries, validation, translation time mechanism, translation-time classes, Understanding JavaServer Pages, Standard Tag Library, tags in JSTL, core tag library, XML tag library, using Internationalization Actions.

**Web Application Deployment and Authentication:** Enterprise Application Development Process, Deploying Web Application, Understanding CLASSPATH, Securing Web Applications, basic authentication with JAX-RPC example, Client certification Authentication over HTTP/SSL.

**Text/Reference Books:**

1. **Java Server Programming J2EE 1.4 Edition:** *Black Book* ( DreamTech Press)
2. **Core Java™ Volume II:** *Cay S.Horstmann & Gary Cornell* (Pearson)
3. **J2EE 1.4 Bible:** *McGovern* (Wiley India)

## CS 402 : Cryptography and Network Security

**Introduction:** The OSI Security Architecture, Security attack, Security services, Security Mechanism, A Model for Network Security.

**Symmetric Cipher:** Classical Encryption Techniques, Symmetric Cipher Model, Block Cipher Principles, DES, Differential and Linear Cryptanalysis, Block Cipher Design Principle, The Euclidean Algorithm, Finite field of Form  $GF(p)$ , Advance Encryption Standard (AES), AES Cipher, Multiple Encryption and Triple DES, Stream Cipher and RC4, Placement of Encryption Function, Traffic Confidentiality, Key Distribution, Random number generation.

**Public Key Encryption and Hash function:** Fermat's & Euler's Theorems, The Chinese Remainder Theorem, RSA Algorithm, Deffie-Hellman Key Exchange, Elliptic Curve Cryptography, Message Authentication Code, Security of Hash Functions and MAACs, Secure Hash algorithm, Whirlpool, HMAC, CMAC, Digital Signature.

**Network Security Applications:** Kerberos, X.509 Authentication Service, S/MIME, IP Security Architecture, Encapsulating Security Payload, Secure Socket Layer (SSL), Transport Layer Security, Secure Electronic Transaction.

**System Security:** Intrusion Detection, Password Management, Virus Countermeasure, Denial of Service Attack, Firewall design Principles, Trusted System

**Text/ References Books:**

1. **Cryptography and Network Security:** *Principles and practices, 4e, William Stalling, Pearson Education.*
2. **Cryptography and Network Security :** *Behrouz Forouzon , TMH*
3. **Introduction to Cryptography:** *Johannes A. Buchmann, Springer*
4. **Beginning Cryptography with java by David Hook:** *Wiley Dreamtech*
5. **Modern Cryptography Theory & Practices :** *Wenbo Mao, Pearson Education*
6. **Cryptography for Database and Internet Application :** *Nick Galbreath, Wiley Dreamtech*

7. **Network Security:** *Private Communication in a Public World, 2e*, by Charlie Kaufman, Radia Perlman, and Mike Speciner, Pearson Education

## CS 403 : Soft Computing

Essentials of Artificial Neural Networks: Introduction, Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity (Feed forward, feedback, Single and Multi-layer), Neural dynamics (Activation and Synaptic), Learning Strategy (Supervised, Unsupervised and Reinforcement), Learning Rules (error Correction, Hebbian, Competitive, Stochastic), Types of Application (Pattern Classification, Pattern Clustering, Pattern Association/ Memory, Function Approximation, Prediction, Optimization) Support Vector Machines, Boltzmann Machine, Feedback (Recurrent) Networks and Dynamical Systems Matrix Memories, Bidirectional Associative Memory, Hopfield Neural Network, Principal Component Analysis Networks (PCA), Kohonen's Self-Organizing Maps, Linear Vector Quantization, Independent Component Analysis Networks (ICA)

**Fuzzy Logic:** Basic concepts, fuzzy set theory, basic operation, fuzzification, defuzzification, neurofuzzy approach, applications

**Evolutionary and Genetic Algorithm:** Basic concepts of evolutionary computing, genetic operators, fitness function and selection, genetic programming, other models of evolution and learning

**Rough Set Theory:** basic Concept, indiscernibility relation, lower and upper approximation, decision systems based on rough approximation, applications

### Text/ Reference Books:

1. Jacek M. Zurada. Introduction to Artificial Neural Systems, jaico Publishers, 1992
2. S. Haykin. Neural Networks: A Comprehensive Foundation, Prentice Hall, 1999
3. P. S. Churchland and T. J. Sejnowski. The Computational Brain. MIT Press, 1992
4. A. M. Ibrahim Introduction to Applied Fuzzy Electronics, PHI, 2004
5. Z. Pawlak. Rough sets, Kluwer Academic Publishers, 1991
6. Genetic Algorithm in Search Optimization and Machine Learning, D. E. Goldberg, Pearson Education, 1989
7. An Introduction to Genetic Algorithms, Melanie Mitchell, PHI, 1998

## CS 404 : Computer graphics & Multimedia Applications

**Introduction:** History, Advantages, Application, I/O Devices Graphic Packages, Languages

**Graphics Techniques:** Jag Free Images on a Raster CRT Interactive Graphics processor for Digital Logic Simulation System, Interactive techniques for 3D shaded Graphics.

**2-D Graphics:** Drawing Elementary figures, Polygon Filling, Transformations, Windowing and clipping, Display file segmentation, Interactive graphics: Interactive input techniques, Event handling, Input functions

**Graphics Standards A 3D Models:** Device Independence AI in Graphics Software, Implementation of Graphics Kernel System (GKS)

**Graphical Workstations:** Routing output to workstations, Types of GKS, Workstations.

**Evaluation of Various 3D Models:** Mathematical Preliminaries, Curves and Surfaces, Clipping, Hidden line and surface removal, rendering, Computer Animation, 3D Shaded Computer Animation the use of 3D abstract Graphical Types in Computer Graphics and Animation, 3D Reconstruction. A case Study, Real-Time Graphics.

**Introduction to Visualization,** Tools for visualization, Applications, etc.

### Text / reference Books:

1. **Computer Graphics C version** By Donald Hearn and M. Pauline Baker, Pearson Education
2. **Mathematical Elements for Computer Graphics** By Roger, TataMcGrawHill Computer Graphics by Hearn, & Baker, PHI
3. **Principles of Interactive Graphics,** by Newman & R. F. Sproull; McGrawHill
4. **Computer Graphics: A Programming Approach,** by Harrington McGrawHill

**CS 405 : Management & Information System**

**Management System:** Types of Management System, Management System Requirement, Anagement level

**Management Functions & Business Process:** Sale and Order Processing, Finance & Budgeting, Human Resource Management, Production Plan & Control, Marketing

**Portfolio & IT Application:** Portfolio Management Concept, Portfolio Management Method, Design & Implementation of Portfolio Management, Tools & Techniques.

**Enterprise Resource Plan (ERP) :** Evolution of Enterprise Information System, Concept of ERP, Supply Chain Management, Customer Relationship Management, ERP Design & Implementation, ERP Tools: SAP, iCUBE

**Text / Reference Books:**

1. **K. C. Laudon & J. P. Laudon, Management Information System ( managing the digital firm) PHI**
2. **Sadagopan S, Management Information System, TMH**