JODHPUR INSTITUTE OF ENGINEERING AND TECHNOLOGY

Important Topics for the students of Vth Semester as suggested by the Faculty Members

Name of Subject: 5CS3-01: Information Theory & Coding

(Mr. Sanjay Bhandari)

Important Topics

Unit Introduction to information theory:

1. Upper and lower bound of entropy $0 \leq H_{max} \leq \log M$.
2. Numerical question based Discrete Memoryless channels Matrix and Diagram Conditional entropy like $H(X, Y) = H(X/Y) + H(Y)$

Unit Source coding schemes for data compaction:

1. Huffman code
2. Shanon-Fane code
3. Hempel-Ziv coding
4. Shannon Channel capacity theorem.
5. SNR bandwidth Trade off

Unit Linear Block Code:

1. Coding & Decoding of linear block code
2. Conversion of non-systematic form of matrices into systematic form.

Unit Cyclic Code:

1. Polynomial operations over Galois fields,
2. Decoding of Cyclic Code (Syndrome Calculation)
3. Encoder & Decoder (n-k)bit shift register

Unit Convolutional Code:

1. Impulse Response
2. Trllis and state diagram.
3. Viterbi Algorithm

5CS4-02: Compiler Design

Mr. Hemant Pareek

Unit-1

1. Compiler, Assembler, Interpreter definition
2. Phase of compiler
3. Bootstrapping
4. Input Buffering and Error handling

Unit-2

1.Parsing and it's types
2 Difference between LLand LR parsing
3. Recursive Descent Parsing, Predictive Parsing, Shift Reduce Parsing

Unit-3

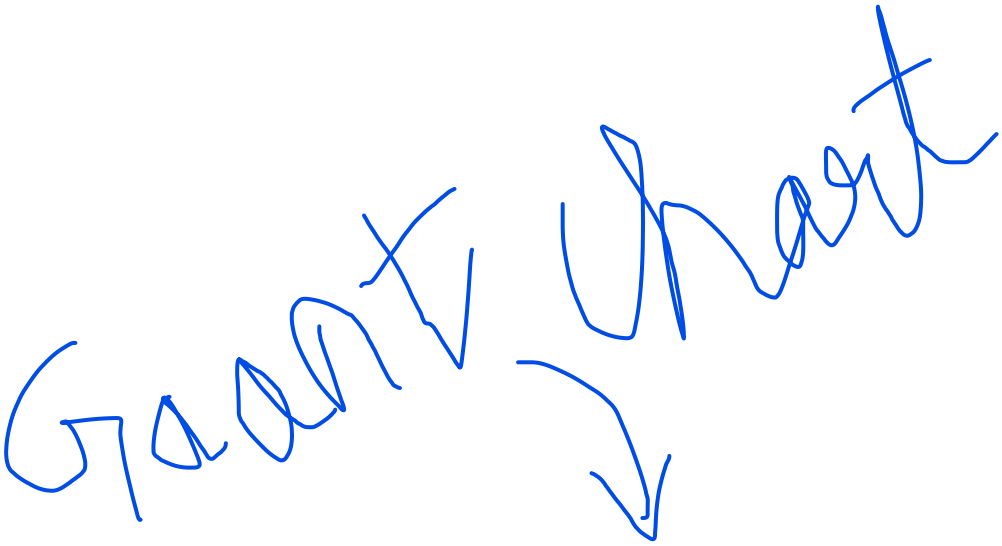
1.Difference between S- attributed definition and L-attributed definition
2.Intermediate code forms using postfix notation
3. DAG, Three address codes
4.Representing TAC using triples and quadruples

Unit-4

1. Storage Allocation
2. Activation Record
3. Parameter Passing
4. Symbol Table Organization

Unit-5

1.Definition andDAG representation of basic block
2. Advantages ofDAG
3. Sources of optimization
4. Loop optimization, Peephole optimization
5. Issues in design of code generator, Code generation from DA



5CS4-03: Operating System

Mrs. Neelam Bohra, Ms Jaya Gangwani

Unit-1

1. Definition & Goals of OS ,Service
2. Structure of OS
3. Process management, lifecycle of process, PCB
4. IPC ,Race condition Wait & Signal
5. Classical IPC Problem
6. Scheduling Algorithm (theory + numerical)
7. Threads and multithreading models

Dining philosopher problems.

Unit-2

1. Contiguous allocation (best fit numerical example)
2. Paging, segmentation, demand paging
3. Page replacement algo (numerical)
4. Thrashing
5. Paging with segmentation

Unit-3

1. Define Deadlock and its necessary condition
2. Resource allocation Graph
3. Deadlock prevention
4. Deadlock avoidance (Banker's algorithm and its numerical)
5. Methods for handling deadlock
6. Disk scheduling algorithm (numerical)

Unit-4

1. File concept and its attribute , types
2. Directory Structure
3. Allocation and access methods

Unit-5

1. Directory structure of Linux OS
2. Mobile OS

3. Take brief overview of process management, scheduling ,file management of various operating system (UNIX , Linux, mobile and Time OS)

5CS4-04: COMPUTER GRAPHICS & MULTIMEDIA

Dr. Pallavi Pratap, Mrs. Jyoti Vyas

Unit-1:

1. Applications of Computer Graphics
2. Working of CRT
3. Raster & Random Scan System

Unit- 2:

1. DDA Line drawing Algorithm
2. Bresenham's Line drawing Algorithm
3. Mid-Point Circle Algorithm
4. Boundary-fill & Flood-fill Algorithm
5. Anti Aliasing

Unit-3:

1. Transformations(5 types)
2. Numerical of Composite Transformation
3. Cohen-Sutherland Line Clipping Algorithm
4. Sutherland-Hodgeman Polygon Clipping Algorith

Unit-4:

1. Bezier Curve & B-Spline Curve (Their equation and Properties)
2. Parallel and Perspective Projections.

Unit-5:

1. Illumination models
2. Halftone patterns and Dithering techniques
3. Color Model

Unit-6:

1. Steps of designing the Animation Sequence
2. Tiling the Plane
3. Multimedia
4. Realism
5. Ray Tracing

5CS4-05 Analysis of Algorithms **Mrs. Arshi Riyaz**

Unit 1:

1. Algorithm and it's characteristics
2. Recurrence relation,
3. Merge Sort
4. Strassen's matrix multiplication.

Unit 2

1. Greedy Method: Knapsack Problem, Job Sequencing
2. Dynamic Programming: Matrix Chain Multiplication.
3. Longest Common Subsequence and 0/1 Knapsack Problem.

Unit 3

1 Branch and Bound: Traveling Salesman Problem.
2 Backtracking: Queens Problem
3. Pattern Matching Algorithms: Rabin Karp string matching algorithms, KMP Matcher Algorithms

Unit 4

1. Assignment Problems: Formulation of Assignment Algorithms- Randomized Algorithm
2. Network Flow using Ford Fulkerson Method.

Unit 5

1. Problem Classes Np, Np-Hard and Np-Complete
2. Cook's Theorem.
3. Proving NP- Complete Problems - Satisfiability problem and Vertex Cover Problem, Set Cover Problem.

5CS5-12 HCI (Human Computer interaction)

(Mr. Santosh Gupta)

Important Topics

Unit-1

1. Interactive system design.
2. Usability, usability engg, usability testing
3. UCD (user centered design)
4. GUI and aesthetics, principles and elements.
5. Prototyping technique

Unit-2

1. GOMS models.
2. KLM models
3. CMN-GOMS model
4 . Fitt's law and Hick-hyman law.

Unit-3

1. Shneiderman's eight golden rule.
2. Norman's seven principles.
3. Nielsen's ten heuristics with example.
4. Norman's model of interaction.
5. Contextual inquiry and Cognitive walkthrough

Unit-4

1. Empirical research methods
2. Experiment design and data analysis.
3. Analysis of empirical data.
4. ANOVA with example.

Unit-5

1. Task analysis and HTA
2 .CTT with temporal operator.
3. Engg task model with characteristic.
4. Dialog design and STN (State transition network)
5. State chart and petri nets with elements .

Unit-6

1. Cognitive architecture and Cognitive architecture application.
2. MHP (Model human processor).
3. Object oriented programming.