

## **B.Tech COMPUTER SCIENCE ENGINEERING (AKU Syllabus) SEMESTER-IV**

### **CS 1X02 COMPUTER ARCHITECTURE**

**L-T-P : 3-0-0 Credit : 3**

**1. Introduction:** Computer Arithmetic, Instruction sets, Introduction to computer organization, CPU Design. **Lecture : 8**

**2. Micro programmed Control:** Control Memory, Address sequencing, Micro program example. **Lec: 5**

**3. Memory and Input- Output Systems:** Hierarchical memory structure, Cache memories, set Associative memory, Virtual Memory, Paging, Segmentation, Input- Output Interface. Asynchronous Data transfer, Programmed I.Q., Interrupts, Direct Memory access. **Lecture : 15**

**4. Introduction to Parallel Processing:** Evolution of computer systems (RISC vs. CISC), Parallelism in uniprocessor systems, Architectural classification schemes. **Lecture : 5**

**5. Principles of Pipelining and Vector Processing :** Pipelining, Overlapped parallelism, Principles of designing pipelines Processors, Vector processing requirements. **Lecture : 5**

**6. Structures & Algorithms for Array Processors :** SIMD Array processors, SIMD Interconnection networks. **Lecture : 4**

### **CS 1X03 DATA STRUCTURES**

**L-T-P : 3-0-0 Credit : 3**

**1. Introduction to algorithm -** Analysis for time and space requirements. **L : 2**

**2. Linear Data Structures and their Sequential Representation:** Array, stack, queue, circular queue and their operations and applications. **Lecture : 7**

**3. Linear Data Structures and their Linked Representation:** Linked linear list, circularly linked linear list Doubly linked list, linked stack, linked queue and their operations and applications. **Lecture : 10**

**4. Nonlinear Data Structures :** Binary trees, binary search trees, representations, operations, thread representations, sequential representation traversals, applications, B-tree, Operation on B- tree, AVL Search tree and operations, Huffman algorithm, height Balanced Tree. **Lecture : 14**

**5. Sorting and Searching :** Bubble Sort, Insertion Sort, selection Sort, Heap Sort, Quick Sort, Radix Sort, Linear and Binary search, Union-Find, Hashing methods, etc. **Lecture : 10**

#### **Text Books :**

1. Data Structure Using C by ISRD group, Tata McGraw Hill.
2. Data Structures by Lipschutz & Pai, Tata McGraw Hill.
3. Data Structure using C and C++ by Langsam, Pearson Education.
4. Data Structure by E. Horowitz and S. Sahni.
5. Data Management & File Structures. 2E, by Mary E. S. Loomis, PHI.
6. Data Structures & Algorithm Analysis in C++, 2e, by Mark Allen Weiss, Pearson Education.
7. An Introduction to Data Structures with applications, Second Edition, by J. P. Tremblay and P. G. Sorenson, Tata McGraw Hill.

#### **Reference Book :**

1. Data Structure using Java by Langsam, Moshe Augenstein and aaron M, Tenenbaum.
2. C and Data Structures by P. S. Deshpande. Wiley India

### **CS 1x05 SYSTEMS PROGRAMMING**

**L-T-P : 3-0-3 Credit : 5**

**1. Introduction :** System software and its components. **Lecture : 2**

**2. Assemblers :** Elements of assembly language programming, Assembly process, Machine Dependent Assembler, Machine- Independent Assembler, Design of multipass / 2-pass assembler, single pass assembler. **Lecture : 10**

**3. Macros and Macro Processor :** Macro definition and call Macro expansion, Nested Macro calls, Design of a Macro preprocessor. **Lecture : 8**

**4. Loaders & Linkers :** Basic Loader Function, Machine- dependent Loader, machine- Independent Loader, Loader Design option, Absolute loader, Bootstrap Loader, Relocation and linking concepts, Design of a linker, self Relocating programs and Overlay structure. **Lecture : 10**

**5. Compiler:** Machine- Dependent Compiler, Machine- Independent Compiler, Compiler Design (Options, Interpreter, P-code Compiler), Compiler-, Case study of Compiler, **Lecture : 10**

**6. Software Tools :** Software Tools for Program Development, Editors, Debug, Monitors, Programmes, Environments user Interfaces. **Lecture : 2**

**Text Books :**

1. System Software : An Introduction to Systems Programming (3rd Edition) by Leland L. Beck, Pearson Education.
2. System programming by John J. Donovan.
3. System programming and operating systems by D. M. Dhamdere.
4. IBM PC assembly language & Programming by Peter Abel, Niyaz Nizamuddin, Pearson Education.
5. Assembly Language Programming for IBM PC Family by William B. Jones, Dreamtech Press.

**Programming Lab (System Programming)**

Symbol table (Tree Storage), construction, Implementation of single pass, two pass, Assembler, Macro Processor, module binder (with limited instruction set). Implementation of software tools like Text editor, Interpreter, program generator etc.

**HS 1X01 ORGANIZATIONAL BEHAVIOR & INDUSTRIAL PSYCHOLOGY**

**L-T-P : 3-0-0 Credit : 3**

**1. Concept of organization & organizational Behavior. Lecture : 2**

**2.**

(a) Personality : meaning, concept , determinants, personality theories (psychoanalytic Theory, Trait Theory and Self Theory).

(b) Perception-meaning , concept, process of perception, significance of perception.

(c) Learning- meaning, concept, nature, component of learning process.

(d) Attitude- meaning, concept, factors in attitude formation, method of finding Employee's attitude.

(e) Value - Meaning and types, value and attitude – similarity and difference.

(f) Motivation- meaning, theory of motivation (Maslow's Theory & Herzberg's Theory). **Lecture : 11**

**3.**

(a) Group & Group Dynamics - concept, importance, classification of groups , reason for group, formation, group cohesiveness.

(b) Team work :meaning , concept, types , creating , an effective team. **Lecture : 4**

**4.**

(a) Communication- concept, process, importance, barrier.

(b) Organizational conflict- meaning, concept, types, stages of conflict, resolution of conflict.

(c) Power & politics- nature and concept, Ethics of power & politics, types of power.

(d) Leadership- concept, qualities and functions of a leader, approaches to the analysis of leadership

**Lecture : 8**

**5. Concept of organization theory**, concept of organization structure, form of organizational structure, form of organizational culture. **Lecture : 7**

**6. (a) Organizational effectiveness** - concept , approaches, criteria of effectiveness.

(b) Organizational change - meaning, factors in Organizational change, process of planned change.

(c) Organizational Development - concept ,need of organizational development, difference between organizational development & management development. **Lecture : 7**

**Text Books :**

1. Organizational behavior by Stephen P. Robbin & Seema Sanghi- pearson
2. Organizational behavior by L.M. Prasad-S Chand & sons

**Reference Book :**

Organization behavior: managing people and organization by Gregory moorehead – Biztantra

**EC 1x04 ANALOG ELECTRONICS**

**L-T-P : 3-0-3 Credit : 5**

**1. Four ideal amplifiers :** Ideal voltage amplifiers, ideal current amplifiers, ideal transresistance amplifiers and ideal transconductance amplifiers and distortions(amplitude or harmonic distortions, frequency distortion and phase distortion); **Lecture : 4**

**2. Mid frequency amplifiers :**

a. Analysis of CB,CE &CC amplifiers using hybrid model(chapter eight of integrated electronics by Millman & Halkias).

b. Low and High Frequency analysis of CB, CE & CC (Chapter 11 and Chapter 12 except Section 12-10 and 12- 11.

c. rise time method for determination of fb using the formula of  $tr_{fh} = 0.35$  and 10% sag method for the determination of flower using sag method. **Lecture : 15**

**3. Bootstrapping in emitter follower**, Darlington pair, cascade amplifier, CC-CB cascade. **Lecture : 4**

**4. Multistage amplifiers** and band width shrinkage in multi stage amplifiers. **Lecture : 3**

**5. Incremental model** of FET and incremental analysis of common source at low & high frequencies. **Lecture : 3**

**6. Noise and noise figure in amplifiers :** Thermal noise, shot noise, flicker noise, Friss formula **Lec: 4**

**7. Class A, Class B and Class AB** power amplifiers with reference to Complementary Symmetry Amplifiers. **Lecture : 5**

**8. Barkhausen criteria and oscillator :** Wien bridge, RC phase shift, quadrature, Hartley, Colpitts oscillator. **Lecture : 6**

**9. Tuned amplifiers-single tuned amplifiers** **Lecture : 4**

**Text Books :**

1. Micro Electronics by Millman And Grabel , McGRAW HILL

2. electronics by Millman & Halkias , McGRAW HILL

**References :**

1. Micro electronics circuit by Sedra and Smith, Oxford University;

2. Micro electronics circuit analysis and design, by Rashid , PWS publication house;

3. Semi conductor circuit application- an introduction to transistors and IC 's by Malvino, TMH;

4. Electronic devices and integrated circuit- BP Singh and Rekha Singh, Pearson education

5. Electronic Principles, 7th Ed. by Albert Malvino & Davis J.Bates, TMH