**CSC 1104 Computer Organization & Architecture**

(a) Description

This course introduces the logical architecture and organization of com- puter systems. It highlights the lower end operations in a typical com puter as well as the way computers manage their resources during op- eration. The course opens up a student to be an informed user of the computer rather than a passive recipient of the computer services.

(b) Aims

The aims of the course are:

*•* To introduce to students the concepts of computer organization;

*•* To highlight to students the way computers process and store the data;

*•* To highlight internal management issues in computer systems.

(c) Learning Outcomes

By the end of the course, the student will be able to know the organi- zation, processing and storage mechanisms of computer systems.

(d) Teaching and Learning Pattern

Teaching will be in terms of lectures as well as tutorials

(e) Indicative Content

*•* Data Representation:

Integer Formats, Binary, Octal and Hexadecimal Systems, Nega- tive integers and 2’s Complement, Floating Point Formats, BCD Formats, Alphanumeric Codes.

*•* Basic Digital Circuits:

Logic gates, Karnaugh maps, Combinatorial Circuits, Binary Adders, Multiplexers and Demultiplexers, Comparators, Decoders and En- coders, Code Converters, ROMS and PLA’s, Sequential Circuits, Flip Flops and Latches, R-S flip flops, J-K flip flops, T flip Flops,

D flip flops, Registers, Shift Registers and Data Transmission, Se- quential Network Design.

*•* Micro Computer Architecture:

CPU, Memory, I/O Devices and Interfaces, System Bus, Exam- ples of CPU Structures, The Intel / Pentium CPU, The Z-80 or Motorolla, Machine Language Instructions, Instruction Formats and Addressing Modes.

*•* The Processing Elements: Macroinstruction execution, Internal Bus Transfers, Detailed Internal Architecture, Microcontrol, Hard- wired Control, Microprogrammed Control, Reduced Instruction Set Computers.

*•* I/O Programming:

Programmed I/O, Interrupt I/O, Polling, Priority Interrupt Sys- tem, Direct Memory Access, I/O processors.

*•* Memory Systems and Memory Management:

Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware

(f ) Assessment method Assessment will be in form of tests and assignments

(40%) and final examination (60%) (g) Reading list

(i) Computer Systems Architecture by M. Morris Mano, Prentice

Hall, 1993

(ii) Structured Computer Organization by Andrew S. Tanebaum, Pren- tice Hall 1984.

(iii) Computer Systems Concepts and Design by Glenn B. Gibson, Prentice Hall, 1991

(iv) Computer Organization and Architecture by William Stallings, Prentice Hall 2003.