CA520 COMPUTER ORGANIZATION AND ARCHITECTURE

Pre-requisite: Basic knowledge of Computer Programming in a high level language

Aims and Objectives: This is a first level course, suitable for both hardware and software oriented students. It not only describes computer structures solely from the programming viewpoint, but also for those who will eventually work with systems that involve a variety of equipment, interfacing, and communication facilities.

Course Content:

Overview of Computer Hardware, History and technological milestones.

Data representation: Codes, number systems, integer representation, sign magnitude, 1's complement, 2's complement. Boolean Algebra, Boolean expressions and their simplification. SOP and POS. Karnaugh Maps, Basic logic gates, logic diagrams.

Combinational circuits: Half adder, Full adder, Subtractor, multiplexer, demultiplexer, decoder, encoder. Sequential circuits: Latches, Flip-flops, RS, JK, D, T types. Counter, shift registers etc. Basic Computer organization, Instruction set, Register transfer language

CPU: Control unit construction, Instruction cycle. Memory organization: Memory hierarchy, Cache, Main memory, auxiliary memory. IO organization, interfacing, Polling, interrupt, Vectored and daisy interrupt structures. DMA, microinstructions, control memory. Computer Arithmetic, Floating point numbers underflow, overflow, precision consideration

Recommended Books:

1. V. Carl Hamacher, Zvonko G. Vranesic, Safwat G. Zaky, Computer Organization, McGraw-Hill International Edition, 1996.
2. Computer System Architecture, Morris M. Mano, Computer System Architecture, Prentice Hall