Introduction to Logic Design; Computer System Architecture and Design: A Practical Approach to Higher Learnin: Strong Laboratory Component

Arun Somani
Anson Marston Distinguished Professor
Jerry R. Junkins Chair Professor and Department Chair
Electrical and Computer Engineering Department
2215 Coover Hall, Iowa State University, Ames, IA 50011
Tel: (515) 294 0442; Fax (515) 294 3637

Goal and Purpose: The goal and purpose of this workshop is to cover the material currently covered in Digital Logic Design, Processor and Computer system Architecture and Computer System Organization. The material will be approached from a different angle and concepts will be proposed and taught based on need and use of material. As a result, the contents would be intermingled and heavy emphasis will be placed on practice as we move into the course.

The topics covered in the whole sequence include Programming language and computer interface; Introduction to microprocessor instruction sets, Assembly language programming and interfaces to higher-level languages; Instruction set design; Number systems and representation. Computer Arithmetic; Arithmetic circuits; Introduction to computer organization; Boolean algebra and logic minimization; Combinational and sequential logic design. Finite state machines; Processor Design; Data-path and control, Pipelining and pipelined control design; Design of a simple digital system; Memory organization and Hierarchy; Interfacing processors and peripherals; Input/output programming. Interrupt handling; Hardware/software design tradeoffs and issues. Evaluating performance of computer systems;

There will be a heavy emphasis on laboratory components; Use of programmable logic devices; and computer-aided schematic capture, Simulation tools, and hardware description languages; Laboratory component using HDLs; and Design projects.

Challenging issue is to keep student interest alive and keeping them engaged. For this purpose laboratory will emphasize what is learnt in the class. A set of labs used will be described.

.

The workshop will build on the topics covered as part of Introduction to Compute Engineering and will review those topics for completeness and will emphasize the advanced topics relating to Computer System Organization, Interfacing with memory and Input Output, and System Design.