EE 4342
Digital System Design II Topics

♦ Review
  • Logic, gates & simplification methods: Boolean Algebra, K-Maps and table methods
  • Combinational circuits and sequential circuit design and analysis

♦ Memory and Programmable Logic Devices
  • RAM, SRAM, DRAM, ROM, EPROM and EEPROM
  • Internal RAM design and timing waveforms
  • Memory design
  • Programmable Logic Arrays and Programmable Array Logic devices
  • VLSI PLDs (Complex Programmable Logic Devices)

♦ Algorithmic State Machines
  • Top-Down design, algorithmic methods & practices
  • The ASM Chart and timing considerations
  • Implementation methods (ROM, combinational, MUX, etc.)

♦ Processor Unit (PU) Design
  • Datapath & register transfer operations
  • Microoperations
  • Bus-based transfer
  • Arithmetic Logic Unit (ALU) design
  • Control Word

♦ Control Unit (CU) Design
  • Hardwired control & implementation methods
  • Microprogrammed control, the control word and microprogramming
  • Pipelining

♦ Instruction Set Architecture
  • Operand addressing, addressing modes, data transfer & manipulation
  • Bus-based transfer
  • Program control and interrupts

♦ Central Processing Unit Design (if time allows)
  • CISC
  • RISC

♦ Input-Output and Communication (if time allows)
  • Sample peripherals & Interfaces
  • Serial communication & Interrupts
  • Modes of transfer: synchronous vs. asynchronous, DMA, etc.