CSE 221
Logic Design and Sequential Circuits

7/20/95
Spring Semester

CSE 221: "Logic Design and Sequential Circuits" (3-3-4)

Boolean algebra and switching circuits; Karnaugh maps; design of combinational and of sequential logic networks; sequential machines.

Text: John P. Hayes, *Introduction to Digital Logic Design,* Addison-Wesley, 1993

Professor-in-Charge: E.W. Henry, Professor

Course Goals:

This course is designed to give sophomores in computer science and engineering an introduction to digital concepts including digital circuit analysis and design.

Prerequisites: None

Topics:	*Number of Lectures:*
Number systems and digital codes.	2
Combinational logic design involving Boolean algebra, minimization techniques and SSI technology.	8
MSI and LSI networks in combinational logic.	3
Iterative networks.	2
Analysis and design of sequential networks (using flip flops) including state concepts and optimization.	15
MSI and LSI networks in sequential logic design.	6
Arithmetic Logic Units	4
Tests	2

Computer Usage: Mentor Graphics "Design Architect" and "Quick Sim II" are exercised on Sun SPARC workstations for schematic capture and simulation of digital circuits.

Laboratory Usage:

Each laboratory station is equipped with a digital logic breadboard unit containing a power supply, timers, switches and indicators, a Tektronix logic analyzer, and a dot-matrix printer. Workstations in the College of Engineering Computer Laboratory are used to simulate circuit designs.

Laboratory assignments progress from investigation of the properties of basic logic gates and flip flops to the design of arithmetic and sequential logic circuits using medium-scale integrated circuit devices.

References:

C. H. Roth, Jr., *Fundamentals of Logic Design* (4th Ed.), West, 1992

M. M. Mano, *Digital Design*, Prentice-Hall, Inc., 1984.

Mentor Graphics, *Getting Started Training Workbooks on Design Architect and QuickSim II.*

Grading:

Exams (3)	65%
Homework	10%
Laboratory	25%

Special Considerations:

In the hardware laboratory, students work in groups of two, but maintain individual laboratory notebooks and submit individual reports. Individual work and reports are required for experiments and projects using the Mentor Graphics computer aided design tools.

Course Content:

Engineering Science:	1.5 credits or 38%
Engineering Design:	2.5 credits or 62%