ECE 221 Digital System Design
Sectional Objectives
Final - Dewey Chapters 1-5 and 8-10

After reading and studying Chapters 1-5 and 8-10 you should be able to:

- convert values between decimal, binary, hexadecimal and octal number systems.
- perform addition, subtraction and multiplication on binary, hexadecimal and octal numbers (unsigned and two's complement representations).
- represent a combinational expression in the following forms: Sum-of-Products (SOP) Product-of-Sums (POS), minterm list, maxterm list.
- create a truth table for components that contain a combination of active-1 and active-0 inputs and outputs.
- use DeMorgan's theorem to complement a function or convert a function to a new representation.
- use Karnaugh maps to minimize logic expressions in either SOP or POS form (recognize prime implicants, essential prime implicants and secondary prime implicants).
- create a minimized implementation of a combinational boolean expression using simple gates (AND, OR, INV), complex gates (XOR, XNOR, MUX, DEMUX), programmable logic (PLA, PAL) or universal gates (NAND, NOR).
- given a set of input waveforms, sketch the output waveforms for various memory types (SR, JK, D, and T) and element classifications (latch, gated latch, and edge-triggered flip flop)
- list the types of counters and understand their operation.
- given a sequence of operations, determine the output of a universal shift register after each clock period.
- generate a state diagram for a Mealy or Moore finite state machine (FSM) from a given specification.
- given a state diagram, describe the operation of a sequential system.
- minimize the number of states needed in a FSM using the implication chart method.
- create a minimized (both logic and states) FSM from a state diagram or specification.

Final Exam Information:

- Open Book, Closed Note
- 5-7 Problems