1 Study guide

1.1 Midterm 1

- ☑ Binary numbers, Hexadecimal, Sign-magnitude, One's-complement and Two's complement. Conversions between them.
- ☑ Generate minterms, maxterms, SOP canonical form and POS canonical forms and convert between them
- ☑ Understand and use the laws and theorems of Boolean Algebra
- ☑ Perform algebraic simplification using Boolean algebra
- ☑ Simplification using K-maps
- ☑ Derive sum of product and product of sums expressions for a combinational circuit
- ☑ Convert combinational logic to NAND-NAND and NOR-NOR forms
- ☑ Simplification using Quine-McCluskey method

1.2 Midterm 2

- ☑ Understand the difference between synchronous and asynchronous inputs
- ☑ Derive a state graph or state table from a word description of the problem
- ☑ Implement a design using JK, SR, D or T flip-flops
- ☑ Analyze a sequential circuit and derive a state-table and a state-graph
- ☑ Analyse and design both Mealy and Moore sequential circuits with multiple inputs and multiple outputs
- ☐ Reduce the number of states in a state table using row reduction and implication tables
- ☐ Perform a state assignment using the guideline method
- ☐ Convert between Mealy and Moore designs

1.3 Final (includes previous topics)

- ☐ Design combinational circuits for positive and negative logic
- ☐ Design Hazard-free two level circuits.
- ☐ Compute fan out and noise margin of one device driving the same time
- ☐ Compute noise margin of one device
- ☐ Describe how tri-state and open-collector outputs are different from totem-pole outputs.
- ☐ Different between and limitations of level-triggered latches and edge-triggered flip-flops.
- ☐ Know the differences and similarities between PAL, PLA, and ROMs and can use each for logic design
- ☐ Design combinational circuits using multiplexers and decoders
- ☐ Partition a system into multiple state machines