

# ECE218 Digital Systems

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Yu Cheng  
Illinois Institute of Technology  
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# Course Framework

## Instructor

- Prof. Yu Cheng, Dept of ECE
- [cheng@iit.edu](mailto:cheng@iit.edu); (312) 567-7996; Siegel Hall 320
- Office Hours: Tuesday/Thursday, 2:00-3:00pm; and by appointment

## Course Description

- Number systems and conversions, binary codes, and Boolean algebra. Switching devices, discrete and integrated digital circuits, analysis and design of combinational logic circuits. Karnaugh maps and minimization techniques. Counters and registers. Analysis and design of synchronous sequential circuits.

## Pre-Requisites

- Sophomore standing, concurrent registration in ECE 211 and ECE 212 is encouraged

## Text Book

- “Digital Design“, 4th edition, by M. Morris Mano and Michael D. Ciletti, Publisher: Pearson Prentice Hall.

# Course Outline

2 classes	Number representation	Sec. 1-1 to 1-9
2 classes	Boolean Algebra, Logic Gates	Sec. 2-1 to 2-5
2 classes	Boolean Functions, Standard and Canonical Forms	Sec. 2-6 to 2-8
2 classes	K-maps	Sec. 3-1 to 3-5
2 classes	Don't care conditions, NAND/NOR implementations, Parity	Sec. 3-6 to 3-9
2 classes	Multilevel logic	Sec. 4-1 to 4-4
2 classes	Combinational logic circuits (1)	Sec. 4-6 to 4-7
2 classes	Combinational logic circuits (2)	Sec. 4-8 to 4-11
2 classes	Sequential Circuits, Flip-flops	Sec. 5-1 to 5-4
2 classes	Finite State Machines, Sequential circuit design	Sec. 5-5 to 5-8
2 classes	Registers	Sec. 6-1
2 classes	Shift Registers, Counters	Sec. 6-2 to 6-5
2 classes	RAM Circuits	Sec. 7-1 to 7-5
2 classes	Programmable Devices	Sec. 7-6 to 7-8
2 classes	Algorithmic State Machines, Multiplier designs	Sec. 8-1, 8-2, 8-4, 8-5, 8-7

# Assignment and Grading

## Homework assignments

- Submit to TA before the specified deadline
  - **NO LATE Assignments accepted without prior instructor consent**
- TA: to be announced

## Grading system

Homework Assignments	5%
Midterm Exam I	30%
Midterm Exam II	30%
Final Exam (Comprehensive)	35%

## How to get good grades (high motivation + hard work)

- Regularly attend the classes and take notes
- Refresh timely after each lecture
- Independently work on the homework problems
- Utilize the office hours for discussions and suggestions

## Course resources

- <http://blackboard.iit.edu> – assignments, assignment solutions, additional distributes