Course Title Digital Circuit Design

Course Number LE242

Credit Hours 45 hours/ 1 semester

Prerequisites None

Instructor Dr. Pongsak Mahachoklertwattana
Title Lecturer
Office Location Research Building 418-5
Email mpongsak@engr.tu.ac.th

Course Descriptions The design and implementation of digital circuits. Topics include number representations, codes, Boolean algebra, logic gates, combinational and sequential circuit design (both synchronous and asynchronous). The real implementations begin with basic gates and progress to Programmable Logic Devices (PLD).

Tentative Course Schedule Introduction to Digital Circuit Design (1 week) Number Systems, Logic Gates (1.5) Boolean Algebra (1) Karnaugh Map (1) Function Minimization Algorithms (1) Design of Combinational Circuits (1.5) —**MIDTERM EXAM**— Introduction to Sequential Circuits, Latches & Flip-Flops (2) Analysis and Design of Synchronous Sequential Circuits (3) Analysis and Design of Asynchronous Sequential Circuits (2) Timing Analysis (1)

Textbook and Reference

[1] S. Brown, Z. Vranesic, *Fundamentals of Digital Logic with VHDL Design 3rd*, McGraw-Hill, 2008.
[2] A. B. Marcovitz, *Introduction to Logic Design 3rd*, McGraw-Hill, 2010.
[3] C. H. Roth, Jr., *Fundamentals of Logic Design 5th*, Wadsworth Publishing Co Inc, 2005.
[4] T. L. Floyd, *Digital Fundamentals 10th*, Prentice-Hall, 2009.
[5] J. F. Wakerly, *Digital Design: Principles and Practices Package 4th*, Prentice-Hall, 2005.
[6] R. F. Tinder, *Engineering Digital Design 2nd*, Academic Press, 2000.
[7] P. K. Lara, *Principles of Modern Digital Design*, John Wiley & Son, 2007.
[8] Lecture Slides, Additional Class Notes, etc.

Grading

Attendance and Assignments	10%
Minitests	15%
Midterm	35%
Comprehensive Final	40%
Total	100%