

Teaching Goals: 本課程旨在介紹數位邏輯電路的基本特性及設計，並提供設計數位系統所使用的基本原理與概念

Learning Goals: 學生可培養基本數位邏輯電路設計的能力，並具備進階課程或實作的基礎

Course Outline: 課程內容包括：

數位系統的基本特性
數字及資料表示系統和轉換
布林代數與邏輯閘
布林代數表示式之化簡
卡諾圖之應用
多層邏輯閘電路
組合邏輯電路設計
多工器，解碼器，以及可程式化邏輯元件（PLD）
序向邏輯電路：門鎖器和正反器
暫存器和計數器

When: 2nd semester, 2024, **T 10:10-12:00, Th 10:10-11:00** (3 credits)

Where: 工程一館 **201**

Handouts: can be downloaded by the student at the **eeclass** platform (<http://eeclass.nthu.edu.tw/>).

Assignments and Grading: Quiz: 8 quizzes, 30% (5 % each) (The lowest two scores will be discarded)

Midterm Exam: 35%

Final Exam: 35%

Instructor: 陳致真 教授 / Chihchen Chen, Professor (x62403, rm. 311, Delta Hall,
chihchen@mx.nthu.edu.tw)

Office Hours: by appointment

Teaching Assistant: TBD

Prerequisites: NA

Textbook: C. H. Roth, Jr. and L. L. Kinney, *Fundamentals of Logic Design*, 7th edition, Cengage Learning, 2013.

References:

1. M. M. Mano and M.D. Ciletti, *Digital Design*, 4th edition, Prentice-Hall, 2007.
2. T. L. Floyd, *Digital Fundamental*, 10th Edition, Prentice Hall, 2008.
3. S. Brown and Z. Vranesic, *Fundamentals of Digital Logic with Verilog Design*, 3rd Edition, McGraw-Hill, 2014.

Course: PME320900 邏輯設計與應用 Logic Design & Applications (approximate schedule)				
wks	Tuesdays	Thursdays	theme	Reading
1	02/20/2024	02/22/2024	<u>Introduction</u> <i>Number Systems and Conversion</i>	Unit 1
2	02/27/2024	02/29/2024		
3	03/05/2024	03/07/2024	<u>Boolean Algebra</u>	Unit 2 & 3
4	03/12/2024	03/14/2024		
5	03/19/2024	03/21/2024	<u>Application of Boolean Algebra</u>	Unit 4
6	03/26/2024	03/28/2024	<u>Karnaugh Maps</u>	Unit 5
7	04/02/2024	04/04/2024		
8	04/09/2024	04/11/2024		
9	04/16/2024	04/18/2024	<u>Multi-level Gate Circuits</u>	Unit 7
10	04/23/2024	04/25/2024	<u>Combinational Circuit Design</u>	Unit 8
11	04/30/2024	05/02/2024	<u>Midterm exam</u>	<i>Unit 1~8 (except Unit 6)</i>
12	05/07/2024	05/09/2024	<u>Multiplexers, Decoders, and Programmable Logic Devices (PLDs)</u>	Unit 9
13	05/14/2024	05/16/2024		
14	05/21/2024	05/23/2024	<u>Latches and Flip-Flops</u>	Unit 11
15	05/28/2024	05/30/2024		
16	06/04/2024	06/06/2024	<u>Registers and Counters</u>	Unit 12
17	06/11/2024	06/13/2024		
18	06/18/2024		<u>Final exam</u>	<i>Unit 9, 11 & 12</i>