朝陽科技大學 093學年度第1學期教學大綱
Digital Systems 數位系統

當期課號	3439	Course Number	3439
授課教師	陳宏達	Instructor	CHEN,HON DA
中文課名	數位系統	Course Name	Digital Systems
開課單位	資訊工程系(四進)二A	Department	
修習別	必修	Required/Elective	Required
學分數	3	Credits	3
課程目標	這個課程介紹數位系統設計與實務，內容包含邏輯電路的基本觀念、電子電路實作邏輯電路、邏輯函數的最佳化、以較大型組合電路來設計邏輯函數、儲存元件、同步與非同步序向電路。在基本觀念上，說明布林代數與邏輯閘；在電子電路實作與邏輯函數最佳化的課程中，我們使用CAD工具來設計與合成電路；接著介紹利用解碼器、編碼器、與多工器來設計邏輯函數；序向電路是另一個重點，包括：位移記錄器、計數器、有限狀態機、以及CAD工具。	Objectives	This course is an introduction to the design and implementation of digital systems. We will study various topics including basic aspects and electronic aspects of logic circuits, optimized implementation of logic functions, combinational circuits used as building blocks, storage elements, synchronous and asynchronous sequential circuits. In the basic aspects of logic circuits, we will study Boolean algebra, logic gates; in the electronic aspects and optimized implementation of logic functions, we study how to synthesize combinational circuits using logic gates and CAD tools. Using decoder, encoders, and multiplexers as building blocks in larger design is presented. Following the studies of combinational circuits, sequential circuits are introduced. We study the storage element (flip-flops), realization of shift registers and counters; explain the behavior of synchronous (asynchronous) sequential circuits (finite state machines) and develop practical design technique for both manual and automated design.
教材	教科書：Digital Design, Mano, 3/e 中譯本 滄海書局 參考書：Digital Electronics Principles & Applications, 6th ed, Roger L. Tokheim, McGraw-Hill	Teaching Materials	
成績評量方式	1. 期中考: 30% 2. 期末考30% 3. 其他: 40% (含學習態度、作業、小考、報告)	Grading	1. 1. Midterm exam. : 30% 2. Final exam. :30% 3. Others(learning attitude, homework, quiz, report..): 40%
教師網頁			
教學內容	1. 數字系統轉換與布林代數 2. 布林代數表示與化簡 3. 基本邏輯閘介紹 4. NAND/NOR多階組合數位電路 5. 加法器,多/解多工器,解/編碼器之介紹 6. 組合邏輯設計 7. 正反器與激勵表 8. 狀態圖及狀態激勵表 9. 同步計數器設計 10. 狀態表簡化 11. 遞迴網路設計 12. MSI序向網路設計 13. ROM/PLA/PAL序向網路設計 14. 算術網路設計	Syllabus	1. Number system and Boolean algebra 2. Boolean algebra 3. Introduction to basic logic gates 4. NAND/NOR muulti-level digital circuit 5. Adder, multiplex/demultiplex, decoder/encoder 6. Combinational logic design 7. Flip-flop and exciting table 8. State diagram and state exciting table 9. Synchronous counter design 10. State table reduction 11. Recursive network design 12. MSI sequential network design 13. ROM/PLA/PAL sequential network design