114-1 Full Curriculum of Da-Yeh University

Information			
Title	Fundamental Digital Design	Serial No./ID	0437 /IFI2011
Required/Credit	Required /3	Time/Place	(Tue)234 /H708
Language	Chinese/English	Grade Type	Number
Lecturer /Full- or Part-time	Huan-Liang Tsai /Full-time	Graduate Class	Non-graduating Class
School System /Dept /Class, Grade	/Department of Computer Science and Information Engineering /Class 1, Grade 2		
Office Hour / Place	(Mon) 16:20~17:10, (Tue) 08:10~09:00, (Wed) 08:10~09:00, (Wed) 10:10~11:00 / H715		
Lecturer	n.a.		

Introduction

The teaching units of this course mainly contain Boolean Algebra unit、Minterm and Maxterm Expansions unit 、Karnaugh Maps unit、Quine-McCluskey Method、Multi-Level Gate Circuits unit and Combinational Circuit Design unit. Each unit offers many exercises. Students can build up correct concepts on combinational circuit design by the instruction and exercises practice.

Outline

1：Boolean Algebra
2：Simplification of Boolean Algebra
3：Applications of Boolean Algebra
4：Minterm and Maxterm Expansions
5：Karnaugh Maps
6：Quine-McCluskey Method
7：Multi-Level Gate Circuits
8：Combinational Circuit Design
9：Multiplexers, Decoders, and Programmable Logic Devices

Prerequisite

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The Relationship Between Courses and Departmental Core Competencies and Basic Skills

- 1.2 Possess the technical skills and ability to use tools required for engineering practice
- 2.2 Possess the ability to plan, execute, and write reports for project proposals
- 2.1 Possess the ability to design experiments, execute them, and analyze and interpret data
- 3.3 Equipped with responsibility for sustainable social development
- 1.1 Possess the mathematical, scientific, and engineering knowledge required for applications in the field of information engineering

- 3.1 Equipped with teamwork, communication skills, and continuous learning capabilities
- 3.2 Equipped with engineering ethics and a global perspective
- 2.3 Possess the ability to design and integrate systems

Teaching Plan						
Core Capability	Weight(%)【A】	Ability index(Performance Indicators)	Teaching Methods	Assessment and Weight	Core Competency Learning Outcomes【B】	Final Exam Grades【C=B*A】
1.1 Possess the mathematical, scientific, and engineering knowledge required for applications in the field of information engineering	20	Professional Ability	Practical Operation (Experiment, Machine Operation Lecturing Student Presentation Special Report	Course Participation: 20% Oral Report: 20% Final Exam: 30% Midterm Exam: 20% Written Report: 10%	Total: 100	20
1.2 Possess the technical skills and ability to use tools required for engineering practice	20	Practical Ability	Lecturing Practical Operation (Experiment, Machine Operation Special Report Student Presentation	Final Exam: 30% Midterm Exam: 20% Course Participation: 20% Written Report: 10% Oral Report: 20%	Total: 100	20
2.1 Possess the ability to design experiments, execute them, and analyze and interpret data	20	Professional Ability	Lecturing Student Presentation Practical Operation (Experiment, Machine Operation Special Report	Midterm Exam: 20% Final Exam: 30% Oral Report: 20% Course Participation: 20% Written Report: 10%	Total: 100	20
2.2 Possess the ability to plan, execute, and write reports for project proposals	10	Practical Ability	Practical Operation (Experiment, Machine Operation Lecturing Student Presentation Special Report	Oral Report: 20% Course Participation: 20% Final Exam: 30% Midterm Exam: 20% Written Report: 10%	Total: 100	10

2.3 Possess the ability to design and integrate systems	10	Professional Ability	Lecturing Practical Operation (Experiment, Machine Operation Special Report	Oral Report: 20% Course Participation: 20% Final Exam: 30% Midterm Exam: 20% Written Report: 10%	Total: 100	10
3.1 Equipped with teamwork, communication skills, and continuous learning capabilities	10	Basic Ability	Practical Operation (Experiment, Machine Operation Student Presentation Special Report	Oral Report: 20% Course Participation: 20% Final Exam: 30% Midterm Exam: 20% Written Report: 10%	Total: 100	10
3.2 Equipped with engineering ethics and a global perspective	5	Basic Ability	Lecturing Special Report Student Presentation Practical Operation (Experiment, Machine Operation	Midterm Exam: 20% Final Exam: 30% Course Participation: 20% Oral Report: 20% Written Report: 10%	Total: 100	5
3.3 Equipped with responsibility for sustainable social development	5	Practical Ability	Student Presentation Practical Operation (Experiment, Machine Operation Lecturing Special Report	Midterm Exam: 20% Final Exam: 30% Course Participation: 20% Oral Report: 20% Written Report: 10%	Total: 100	5

Grade Auditing

Final Exam: 30%
Course Participation: 20%
Midterm Exam: 20%
Oral Report: 20%

Written Report: 10%

Book Type (Respect intellectual property rights. Please use official textbooks and do not illegally photocopy others' works.)		
Book Type	Book name	Author
Textbook	Fundamentals of Logic Design	Charles H. Roth, Jr. , Larry L. Kinney , Eugene B. John
Textbook	數位邏輯設計	周靜娟、顏培仁

Lesson Plan		
Weeks	Content	Teaching Methods
1	Binary & Intellectual Property Protection (use legitimate textbooks only) & Traffic safety Propaganda & Gender equality education promotion	Lecturing、 Special Report
2	Bollen algebra	Lecturing、 Practical Operation (Experiment, Machine Operation、 Special Report
3	Bollen algebra	Lecturing、 Practical Operation (Experiment, Machine Operation、 Special Report
4	AND/OR	Lecturing、 Practical Operation (Experiment, Machine Operation、 Special Report
5	K-map	Special Report
6	Multi-gate circuit	Lecturing、 Practical Operation (Experiment, Machine Operation、 Special Report
7	Combinational gate design	Lecturing、 Practical Operation (Experiment, Machine Operation、 Special Report
8	Combinational gate circuit	Lecturing、 Practical Operation (Experiment, Machine Operation、 Special Report
9	VHDL	Lecturing、 Special Report

10	Latch and flip-flop	Lecturing、 Practical Operation (Experiment, Machine Operation、 Special Report
11	register and counter	Lecturing、 Practical Operation (Experiment, Machine Operation、 Special Report
12	Sequential circuit	Lecturing、 Practical Operation (Experiment, Machine Operation、 Special Report
13	State diagram	Lecturing、 Practical Operation (Experiment, Machine Operation、 Special Report
14	State diagram reduction	Lecturing、 Practical Operation (Experiment, Machine Operation、 Special Report
15	Sequential circuit design	Lecturing、 Practical Operation (Experiment, Machine Operation、 Special Report
16	Arthimetic operation	Lecturing、 Practical Operation (Experiment, Machine Operation、 Special Report
17	Self-directed Learning & Flexible Teaching/Learning	Flexible Teaching - Independent Action
18	Self-directed Learning & Flexible Teaching/Learning	Flexible Teaching - Independent Action