113-1 Full Curriculum of Da-Yeh University

Information			
Title	Fundamental Digital Design	Serial No./ID	0385 /IFI2011
Required/Credit	Required /3	Time/Place	(Thu)567 /H708
Language	Chinese	Grade Type	Number
Lecturer /Full- or Part-time	Tsai Huan-Liang /Full-time	Graduate Class	Non-graduating Class
School System /Dept /Class, Grade	Bachelor /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, (Thu) 08:10~09:00 / 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 Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
- 2.1 Ability to design and conduct experiments, as well as to analyze and interpret data
- 2.2 Ability to propose, conduct, and write the reports of a research project
- 2.3 Ability to dedign and integrate the systems
- 3.1 Ability to cooperate supportively with others and communicate effectively

3.3 Ability to engage in life-long learning

1.1 Knowledge of mathematics and physics for the application of information engineering

3.2 Understanding of engineering ethics and international vision

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】
1.2 Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	10	The practical abilities	Practical Operation (Experiment, Machine Operation Lecturing Special Report	Course Participation: 20% Final Exam: 30% Midterm Exam: 30% Written Report: 20%	Total: 100	10
2.1 Ability to design and conduct experiments, as well as to analyze and interpret data	20	The professional abilities	Practical Operation (Experiment, Machine Operation Lecturing Special Report	Course Participation: 20% Final Exam: 30% Midterm Exam: 30% Oral Report: 20%	Total: 100	20
2.3 Ability to dedign and integrate the systems	20	The professional abilities	Lecturing Practical Operation (Experiment, Machine Operation Special Report	Midterm Exam: 30% Final Exam: 30% Course Participation: 20% Oral Report: 20%	Total: 100	20
1.1 Knowledge of mathematics and physics for the application of information engineering	50	The professional abilities	Lecturing Practical Operation (Experiment, Machine Operation Special Report	Midterm Exam: 30% Final Exam: 30% Course Participation: 20% Oral Report: 20%	Total: 100	50

Grade Auditing

Midterm Exam: 30%
Final Exam: 30%
Course Participation: 20%
Oral Report: 18%
Written Report: 2%

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

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