Tamkang University Academic Year 114, 1st Semester Course Syllabus

Course Title	LOGIC DESIGN	Instructor	HUANG, SHAO-KANG
Course Class	TKFXB2P DEPARTMENT OF ARTIFICIAL INTELLIGENCE, 2P	Details	◆ General Course ◆ Selective ◆ One Semester ◆ 3 Credits
Relevance to SDGs	SDG4 Quality education SDG8 Decent work and economic growth SDG9 Industry, Innovation, and Infrastructure		

Departmental Aim of Education

Ⅰ. Students may analyze problems in applied science based on the fundamental knowledge of programming, mathematics, and artificial intelligence.

Ⅱ. Students may plan and implement an AI system following the procedures of problem analysis, experiment testing, data visualizing, derivation and deduction.

Ⅲ. Educate the students to be AI engineers who may accomplish their missions indepedently and may collaborate with their colleagues in the workplace.

Ⅳ. Students may have basic skills and global competence for career diversification, and may keep lifelong learning.

Subject Departmental core competences

A. Professional analysis.(ratio:45.00)

B. Practical application.(ratio:10.00)

C. Professional attitude.(ratio:20.00)

D. Global Mobility.(ratio:25.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:15.00)

2. Information literacy. (ratio:20.00)

3. A vision for the future. (ratio:15.00)

4. Moral integrity. (ratio:10.00)

5. Independent thinking. (ratio:20.00)

6. A cheerful attitude and healthy lifestyle. (ratio:5.00)

7. A spirit of teamwork and dedication. (ratio:5.00)

8. A sense of aesthetic appreciation. (ratio:10.00)

Course Introduction	This course is designed to develop students' fundamental concepts and practical skills in digital logic design. The topics include Boolean algebra and logic simplification, combinational logic circuits, sequential logic circuits, and basic circuit design methodologies. Through systematic lectures and practice-based assessments, students will gain an understanding of the principles of digital systems, and acquire the essential ability to analyze, design, and verify digital circuits, thereby building a solid foundation for advanced courses such as computer organization and digital system design.

The correspondences between the course's instructional objectives and the cognitive, affective, and psychomotor objectives.

Differentiate the various objective methods among the cognitive, affective and psychomotor domains of the course's instructional objectives.

I. Cognitive : Emphasis upon the study of various kinds of knowledge in the cognition of the course's veracity, conception, procedures, outcomes, etc.
II.Affective : Emphasis upon the study of various kinds of knowledge in the course's appeal, morals, attitude, conviction, values, etc.
III.Psychomotor: Emphasis upon the study of the course's physical activity and technical manipulation.

No.	Teaching Objectives	objective methods
1	1. Students will be able to understand the fundamental principles of digital systems. 2. Students will be able to apply Boolean algebra and logic simplification techniques to analyze and optimize digital circuits.	Cognitive

The correspondences of teaching objectives : core competences, essential virtues, teaching methods, and assessment

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCD	12345678	Lecture, Discussion, Experience	Testing, Study Assignments, Discussion(including classroom and online)

Course Schedule

Week	Date	Course Contents	Note
1	114/09/15 ~ 114/09/21	Course Introduction	
2	114/09/22 ~ 114/09/28	Introduction of Digital Systems	
3	114/09/29 ~ 114/10/05	Binary Numbers and Base Conversion	
4	114/10/06 ~ 114/10/12	Boolean Algebra	

5	114/10/13 ~ 114/10/19	Boolean Algebra	
6	114/10/20 ~ 114/10/26	Logic Gates	
7	114/10/27 ~ 114/11/02	Karnaugh map	
8	114/11/03 ~ 114/11/09	Karnaugh map	
9	114/11/10 ~ 114/11/16	Midterm Exam	
10	114/11/17 ~ 114/11/23	Combinational Logic	
11	114/11/24 ~ 114/11/30	Combinational Logic	
12	114/12/01 ~ 114/12/07	Combinational Logic	
13	114/12/08 ~ 114/12/14	Synchronous Sequential Logic	
14	114/12/15 ~ 114/12/21	Synchronous Sequential Logic	
15	114/12/22 ~ 114/12/28	Registers and Counters	
16	114/12/29 ~ 115/01/04	Final Week of Diverse Assessments	
17	115/01/05 ~ 115/01/11	Final Week of Diverse Assessments/Flexible Teaching Week for Teachers	
18	115/01/12 ~ 115/01/18	Flexible Teaching Week for Teachers	

Key capabilities	self-directed learning International mobility Information Technology Problem solving
Interdisciplinary	STEAM course (S:Science, T:Technology, E:Engineering, M:Math, A field:Integration of Art and Humanist) Competency-based education 'competency exploration' sustained competency or global issues STEEP (Society, Technology, Economy, Environment, and Politics)
Distinctive teaching	
Course Content	Logical Thinking
Requirement	

Textbooks and Teaching Materials	Using teaching materials from other writers:Textbooks, Presentations Name of teaching materials: M. Morris Mano and Michael Ciletti, Digital Design: With an Introduction to the Verilog HDL, VHDL, and SystemVerilog, 6/e, Pearson FT Press
References	M. Morris Mano and Michael Ciletti, Digital Design: With an Introduction to the Verilog HDL, VHDL, and SystemVerilog, 6/e, Pearson FT Press Charles Roth Jr., Larry Kinney, Eugene John, Fundamentals of Logic Design, Enhanced Edition, 7/e (Hardcover), Cengage Learning
Grading Policy	◆ Attendance： 20.0 % ◆ Mark of Usual：20.0 % ◆ Midterm Exam： 30.0 % ◆ Final Exam： 30.0 % ◆ Other〈 〉： %
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at https://web2.ais.tku.edu.tw/csp or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at http://www.acad.tku.edu.tw/CS/main.php. ※"Adhere to the concept of intellectual property rights" and "Do not illegally photocopy, download, or distribute." Using original textbooks is advised. It is a crime to improperly photocopy others' publications.