

Tamkang University Academic Year 114, 1st Semester Course Syllabus

Course Title	DESIGN AND APPLICATION OF INDUSTRY 4.0 THEORY	Instructor	CHANG, SHIH-HSING
Course Class	TEBXD1A DOCTORAL PROGRAM, DEPARTMENT OF MECHANICAL AND ELECTRO-MECHANICAL ENGINEERING, 1A	Details	◆ General Course ◆ Selective ◆ One Semester ◆ 3 Credits
Relevance to SDGs	SDG4 Quality education SDG9 Industry, Innovation, and Infrastructure		
D e p a r t m e n t a l A i m o f E d u c a t i o n			
I . To prepare students who have a comprehensive understanding of the principles of applied sciences and engineering to be innovators in the field of mechanical and electromechanical engineering. II. To train emerging professionals who possess a high level of expertise and ethical standards who will become independent research and development leaders in the industry. III. To motivate students who will pursue continuing education as a means to stay on the cutting edge of global competitiveness and meet changes in their careers and the workplace with confidence and ease.			
Subject Departmental core competences			
A. Head: Knowledge of mechanical and electromechanical engineering.(ratio:30.00) B. Hand: Hands-on skills and practical realization.(ratio:15.00) C. Heart: Love of learning and innovation.(ratio:30.00) D. Eye: Vision of progress and improvements.(ratio:25.00)			
Subject Schoolwide essential virtues			
1. A global perspective. (ratio:30.00) 2. Information literacy. (ratio:10.00) 3. A vision for the future. (ratio:15.00) 4. Moral integrity. (ratio:5.00) 5. Independent thinking. (ratio:20.00) 6. A cheerful attitude and healthy lifestyle. (ratio:10.00) 7. A spirit of teamwork and dedication. (ratio:5.00) 8. A sense of aesthetic appreciation. (ratio:5.00)			

Course Introduction	<p>AI is changing our lives, our work, and even the way we think about it. It will bring profound changes to the education, society, economy, and politics of all human beings.</p> <p>Its courses begin from the first industrial revolution in the 18th century. With the progress of industry, from mechanization, electrification, computerization, and networking, this series of control courses such as: Hydraulic & Pneumatic Control, Electrical Control, and Programmable Logic Control, Computer Control, Single Chip Control, Network Control, AI control.</p>
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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	The strength of cultivating students' hands and brains is based on academic theory, turning knowledge into skills. When they enter the industry, it can be an excellent engineer who can design and manufacture.	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	Report(including oral and written)

Course Schedule

Week	Date	Course Contents	Note
1	114/09/15 ~ 114/09/21	Introduction to the evolution of industry (from Industry 1.0 to Industry 4.0)	
2	114/09/22 ~ 114/09/28	Introduction to Industry 4.0	
3	114/09/29 ~ 114/10/05	Mechanization: Hydraulic control	
4	114/10/06 ~ 114/10/12	Mechanization: Pneumatic control	

5	114/10/13 ~ 114/10/19	Electrification: Electrical control	
6	114/10/20 ~ 114/10/26	Electrification: Electrical control	
7	114/10/27 ~ 114/11/02	Electrification: Electrical control	
8	114/11/03 ~ 114/11/09	Computerization: Programmable control	
9	114/11/10 ~ 114/11/16	Computerization: Programmable control	
10	114/11/17 ~ 114/11/23	Midterm exam	
11	114/11/24 ~ 114/11/30	Computerization: Programmable control	
12	114/12/01 ~ 114/12/07	Computerization: Computer control	
13	114/12/08 ~ 114/12/14	Computerization: Single chip control	
14	114/12/15 ~ 114/12/21	Networking: Network control	
15	114/12/22 ~ 114/12/28	Networking: AI control	
16	114/12/29 ~ 115/01/04	AI theoretical foundation	
17	115/01/05 ~ 115/01/11	AI manufacturing technology	
18	115/01/12 ~ 115/01/18	Final exam	
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)		
Distinctive teaching	Special/Problem-Based(PBL) Courses		
Course Content	Logical Thinking AI application		
Requirement			

Textbooks and Teaching Materials	Self-made teaching materials:Presentations
References	
Grading Policy	<p>◆ Attendance : 30.0 % ◆ Mark of Usual : 15.0 % ◆ Midterm Exam : 15.0 %</p> <p>◆ Final Exam : 40.0 %</p> <p>◆ Other () : %</p>
Note	<p>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.</p> <p>※"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.</p>