Course Title	DESIGN OF SERVOMOTOR CONTROL	Instructor	TSAI, TAI TING
Course Class	TETJM1A MASTER'S PROGRAM IN ARTIFICIAL INTELLIGENCE ROBOTICS, DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING, 1A	Details	◆ General Course ◆ Selective ◆ One Semester ◆ 3 Credits
Relevance to SDGs	SDG4 Quality education SDG9 Industry, Innovation, and Infrastructure		

Departmental Aim of Education

Ⅰ. Educate students to have electrical and robotic engineering knowledge to solve electrical engineering related problems.

Ⅱ. Educate the student as a senior electrical and robotic engineer to enable creative thinking, to be independently complete the assigned tasks and be willing to work as a team member.

Ⅲ. Educate students to have advanced global awareness to cope with the challenges of modern diversified professor careers.

Subject Departmental core competences

A. Core competency 1.1: Have professional knowledge in the disciplines of electrical, computer and robotic engineerings.(ratio:30.00)

B. Core competency 1.2: Have the ability to plan and execute electrical and robotic engineering research studies.(ratio:30.00)

C. Core competency 2.1: Have the ability to prepare professional papers in the electrical and robotic engineering field.(ratio:10.00)

D. Core competency 2.2: Have the abilities to be creative thinking and to independently solve electrical and robotic engineering related problems.(ratio:10.00)

E. Core competency 2.3: Have the ability to lead, manage, plan, coordinate and integrate personnel from various fields.(ratio:10.00)

F. Core competency 3.1: Have advanced global awareness and the ability of lifelong self-study.(ratio:10.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:10.00)

2. Information literacy. (ratio:15.00)

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

4. Moral integrity. (ratio:15.00)

5. Independent thinking. (ratio:10.00)

6. A cheerful attitude and healthy lifestyle. (ratio:10.00)

7. A spirit of teamwork and dedication. (ratio:15.00)

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

Course Introduction	The purpose of this course is to provide students with fundamental concepts of fuzzy sets, fuzzy logic, and fuzzy control design. Students will learn how to design fuzzy controllers, implement them in Matlab/Simulink, and apply them to nonlinear control problems such as wheeled robots and autonomous systems.

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	To learn the motor driver system	Cognitive
2	To learn the control system	Cognitive
3	To learn the dynamic model of motor driver	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	AB	123	Lecture, Practicum	Testing, Practicum
2	CD	456	Lecture, Practicum	Testing, Practicum
3	EF	78	Lecture, Practicum	Testing, Practicum

Course Schedule			
Week	Date	Course Contents	Note
1	114/09/15～114/09/21	Introduction to the course and applications of fuzzy control	
2	114/09/22～114/09/28	Fuzzy sets and membership functions	
3	114/09/29～114/10/05	Fuzzy operations and inference mechanisms	
4	114/10/06～114/10/12	Design of fuzzy rule base	
5	114/10/13～114/10/19	Fuzzy controller design (Single-Input Single-Output systems)	
6	114/10/20～114/10/26	Fuzzy controller design (Multi-Input Multi-Output systems)	
7	114/10/27～114/11/02	Matlab/Simulink simulation of fuzzy control	
8	114/11/03～114/11/09	Comparison of fuzzy control and PID control	
9	114/11/10～114/11/16	Midterm exam / Midterm project presentation	
10	114/11/17～114/11/23	Adaptive fuzzy control	
11	114/11/24～114/11/30	Neuro-fuzzy control	
12	114/12/01～114/12/07	Applications of fuzzy control to nonlinear systems	
13	114/12/08～114/12/14	Multi-objective fuzzy control	
14	114/12/15～114/12/21	Industrial applications of fuzzy control	
15	114/12/22～114/12/28	Performance analysis of fuzzy control systems	
16	114/12/29～115/01/04	Advanced topics in fuzzy control	
17	115/01/05～115/01/11	Project presentation and discussion	
18	115/01/12～115/01/18	Final exam (Fuzzy control theory and design)	
Key capabilities	Information Technology Problem solving		
Interdisciplinary			

Distinctive teaching	
Course Content	Computer programming or Computer language (students have hands-on experience in related projects)
Requirement	
Textbooks and Teaching Materials	Self-made teaching materials:Presentations Using teaching materials from other writers:Videos
References	
Grading Policy	◆ Attendance： 40.0 % ◆ Mark of Usual：30.0 % ◆ Midterm Exam： 10.0 % ◆ Final Exam： 20.0 % ◆ 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.