Tamkang University Academic Year 109, 1st Semester Course Syllabus

Course Title	FUZZY SYSTEMS	Instructor	CHIEN-FENG WU
Course Class	TETXD1A DOCTORAL PROGRAM, DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING, 1A	Details	◆ General Course ◆ Selective ◆ One Semester

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:40.00)

C. Core competency 2.1: Have the ability to prepare professional papers in the electrical and robotic engineering field.(ratio:30.00)

D. Core competency 2.2: Have the abilities to be creative thinking and to independently solve electrical and robotic engineering related problems.(ratio:30.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:25.00)

2. Information literacy. (ratio:25.00)

3. A vision for the future. (ratio:25.00)

5. Independent thinking. (ratio:25.00)

	Course Introduction	Our aim is to introduce the basic theories of fuzzy logic to students. In addition, An extra project will be assigned to student for ensuring that students have the ability to design a fuzzy controller by themselves.

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	Ensure students can using fuzzy theories to accomplish nonlinear controller or filter design.	Cognitive
2	Understand Fuzzy Set and Fuzzy Logic Operator	Cognitive
3	Ensure students understand how to establish fuzzy inference engine.	Cognitive
4	Ensure student can accomplish the design of fuzzy controller alone.	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ACD	1235	Lecture, Discussion, Imitation	Testing, Study Assignments, Practicum
2	AD	25	Lecture, Discussion	Testing, Study Assignments
3	A	25	Lecture, Discussion	Testing, Study Assignments
4	ACD	1235	Lecture, Discussion	Testing, Study Assignments, Practicum, Report(including oral and written)

Week	Date	Course Contents	Note
		Course Schedule	
1	109/09/14 ~ 109/09/20	What Are Fuzzy Systems	
2	109/09/21 ~ 109/09/27	Fuzzy Sets and Basic Operations on Fuzzy Sets	
3	109/09/28 ~ 109/10/04	Further Operations on Fuzzy Sets	
4	109/10/05 ~ 109/10/11	Fuzzy Relations and the Extension Principle	
5	109/10/12 ~ 109/10/18	Linguistic Variables and Fuzzy IF-THEN Rules	
6	109/10/19 ~ 109/10/25	Fuzzy Logic and Approximate Reasoning	
7	109/10/26 ~ 109/11/01	Fuzzy Rule Base and Fuzzy Inference Engine	
8	109/11/02 ~ 109/11/08	Fuzzifiers and Defuzzifiers	
9	109/11/09 ~ 109/11/15	Fuzzy Systems as Nonlinear Mappings	
10	109/11/16 ~ 109/11/22	Approximation Properties of Fuzzy Systems I	
11	109/11/23 ~ 109/11/29	Approximation Properties of Fuzzy Systems II	
12	109/11/30 ~ 109/12/06	Design of Fuzzy Systems Using A Table Look-Up Scheme	
13	109/12/07 ~ 109/12/13	Fuzzy Control of Linear Systems I: Stable Controllers	
14	109/12/14 ~ 109/12/20	Fuzzy Control of Linear Systems 11: Optimal and Robust Controllers	
15	109/12/21 ~ 109/12/27	Fuzzy Control of Nonlinear Systems I: Sliding Control	
16	109/12/28 ~ 110/01/03	Fuzzy Control of Nonlinear Systems II: T-S Fuzzy Model	
17	110/01/04 ~ 110/01/10	Fuzzy Control of Fuzzy System Models	
18	110/01/11 ~ 110/01/17	Advanced Adaptive Fuzzy Controllers	

Requirement	Teach in English
Teaching Facility	Computer, Projector
Textbooks and Teaching Materials	Li-Xin Wang, A Course in Fuzzy Systems and Control, Prentice-Hall, 1997.

References	J.-S. R. Jang, C.-T. Sun, and E. Mizutani, Neuro-Fuzzy and Soft Computing, Prentice Hall, 1997
Number of Assignment(s)	**5** (Filled in by assignment instructor only)
Grading Policy	◆ Attendance： 10.0 % ◆ Mark of Usual：30.0 % ◆ Midterm Exam： 30.0 % ◆ Final Exam： 30.0 % ◆ Other〈 〉： %
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at http://info.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 . **※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.**