

Tamkang University Academic Year 109, 2nd Semester Course Syllabus

Course Title	NEURAL NETWORK	Instructor	CHIEN-FENG WU
Course Class	TETXD1A DOCTORAL PROGRAM, DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING, 1A	Details	<ul style="list-style-type: none"> ◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	SDG4 Quality education SDG8 Decent work and economic growth SDG9 Industry, Innovation, and Infrastructure SDG10 Reducing inequalities		
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) B. Core competency 1.2: Have the ability to plan and execute electrical and robotic engineering research studies.(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	This course will introduce some basic principles of Neural Networks and their applications to function approximation and signal classification. The networks include single layer perceptron, multilayer perceptron, radial basis function network and dynamically recurrent network. Learning algorithms include supervised learning and unsupervised learning.
------------------------	--

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 objective of this course is to provide students and engineers with comprehensive and well-organized basic principles underlying the analysis, design and synthesis of neural network systems.	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABD	1235	Lecture, Discussion	Testing, Study Assignments, Report(including oral and written)

Course Schedule

Week	Date	Course Contents	Note
1	110/02/22 ~ 110/02/28	Introduction	
2	110/03/01 ~ 110/03/07	Hebb rule, perceptron learning rule, delta rule	
3	110/03/08 ~ 110/03/14	Backpropagation neural network	

4	110/03/15 ~ 110/03/21	GA and neural networks	
5	110/03/22 ~ 110/03/28	Fuzzy aggregation network	
6	110/03/29 ~ 110/04/04	Radial basis function neural network	
7	110/04/05 ~ 110/04/11	Recurrent backpropagation neural network	
8	110/04/12 ~ 110/04/18	Competitive learning	
9	110/04/19 ~ 110/04/25	SOM/LVQ	
10	110/04/26 ~ 110/05/02	Fuzzy ART	
11	110/05/03 ~ 110/05/09	Counter propagation	
12	110/05/10 ~ 110/05/16	Probabilistic neural networks	
13	110/05/17 ~ 110/05/23	Hopfield network	
14	110/05/24 ~ 110/05/30	BAM	
15	110/05/31 ~ 110/06/06	Optimization	
16	110/06/07 ~ 110/06/13	Boltzmann machine	
17	110/06/14 ~ 110/06/20	Applications 1	
18	110/06/21 ~ 110/06/27	Applications 2	
Requirement			
Teaching Facility		Computer, Projector	
Textbooks and Teaching Materials		C.T. Lin and C.S.George Lee, " Neural Fuzzy Systems", Prentice Hall International Inc.	
References			
Number of Assignment(s)		4 (Filled in by assignment instructor only)	
Grading Policy		◆ Attendance : 10.0 % ◆ Mark of Usual : 10.0 % ◆ Midterm Exam : 30.0 % ◆ Final Exam : 30.0 % ◆ Other 〈Homework〉 : 20.0 %	

Note	<p>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 .</p> <p>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</p>
------	---