Tamkang University Academic Year 113, 2nd Semester Course Syllabus

Course Title	DEEP LEARNING	Instructor	CHEN, DUEN-KAI
Course Class	TEIBM1A MASTER'S PROGRAM, DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING (ENGLISH-TAUGHT PROGRAM), 1A	Details	◆ General Course ◆ Required ◆ One Semester ◆ 3 Credits
Relevance to SDGs	SDG4 Quality education		

Departmental Aim of Education

Ⅰ. Cultivate the ability to conduct independent research and problem solving.

Ⅱ. Strengthen creativity and research capacity.

Ⅲ. Build profound professional knowledge in computer science and information engineering.

Ⅳ. Engage in self-directed lifelong learning.

Subject Departmental core competences

A. Independent problem solving ability.(ratio:20.00)

B. Independent innovative thinking ability.(ratio:20.00)

C. Research paper writing and presentation ability.(ratio:10.00)

D. Research & development (R&D) ability in information engineering.(ratio:20.00)

E. Project execution and control ability.(ratio:20.00)

F. Lifelong self-directed learning ability.(ratio:10.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:10.00)

2. Information literacy. (ratio:20.00)

3. A vision for the future. (ratio:10.00)

4. Moral integrity. (ratio:10.00)

5. Independent thinking. (ratio:10.00)

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

7. A spirit of teamwork and dedication. (ratio:20.00)

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

Course Introduction	Deep learning is a subset of machine learning that focuses on utilizing deep neural networks (networks with multiple hidden layers) to perform tasks such as classification, regression, and representation learning. This course will start with traditional Machine Learning approaches and then move to modern Deep Learning architectures like Convolutional Neural Networks. Upon completion of the course, students will learn to apply Deep Learning techniques to solve various problems.

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	This course provides an introduction to Deep Learning. Students will learn to select or design neural network architectures for new data problems based on their requirements, and problem characteristics, and then analyze their performance. This course will also describe some of the latest research being conducted in the field and open problems that are yet to be solved.	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCDEF	12345678	Lecture, Discussion, Practicum	Study Assignments, Discussion(including classroom and online), Practicum, Report(including oral and written), Activity Participation

Course Schedule

Week	Date	Course Contents	Note
1	114/02/17 ~ 114/02/23	Course introduction	

2	114/02/24 ~ 114/03/02	Introduction to Artificial Neural Networks	
3	114/03/03 ~ 114/03/09	Full-cycle of a Deep Learning Project	
4	114/03/10 ~ 114/03/16	Deep Learning Strategy / Optimization of Deep Neural Networks	
5	114/03/17 ~ 114/03/23	Deep Learning Strategy / Optimization of Deep Neural Networks	
6	114/03/24 ~ 114/03/30	Structured Neural Representations	
7	114/03/31 ~ 114/04/06	Structured Neural Representations	
8	114/04/07 ~ 114/04/13	Applications of Deep Learning - Translation	
9	114/04/14 ~ 114/04/20	Applications of Deep Learning - Speech Recognition	
10	114/04/21 ~ 114/04/27	Course Project Topic Selection	
11	114/04/28 ~ 114/05/04	Generative Models	
12	114/05/05 ~ 114/05/11	Generative Models	
13	114/05/12 ~ 114/05/18	Advance Topics in Deep Learning	
14	114/05/19 ~ 114/05/25	Advance Topics in Deep Learning	
15	114/05/26 ~ 114/06/01	Advance Topics in Deep Learning	
16	114/06/02 ~ 114/06/08	Advance Topics in Deep Learning	
17	114/06/09 ~ 114/06/15	Course Project Presentation	
18	114/06/16 ~ 114/06/22	Flexible Week	

Key capabilities	self-directed learning Information Technology Problem solving
Interdisciplinary	STEAM course (S:Science, T:Technology, E:Engineering, M:Math, A field:Integration of Art and Humanist)
Distinctive teaching	Project implementation course

Course Content	Computer programming or Computer language (students have hands-on experience in related projects) Logical Thinking AI application
Requirement	
Textbooks and Teaching Materials	Using teaching materials from other writers:Presentations, Videos, Worksheets
References	
Grading Policy	◆ Attendance： % ◆ Mark of Usual：70.0 % ◆ Midterm Exam： % ◆ Final Exam： % ◆ Other〈Course project〉：30.0 %
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.**