

Tamkang University Academic Year 111, 2nd Semester Course Syllabus

Course Title	INTRODUCTION TO MACHINE LEARNING	Instructor	HO THI TRANG
Course Class	TEIDB3P DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING (ENGLISH-TAUGHT PROGRAM), 3P	Details	<ul style="list-style-type: none"> ◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	SDG9 Industry, Innovation, and Infrastructure		
Departmental Aim of Education			
<ul style="list-style-type: none"> I. Comprehend professional knowledge. II. Acquire mastery of Practical Skills. III. Establish creative achievement. 			
Subject Departmental core competences			
<ul style="list-style-type: none"> A. Programming and application ability.(ratio:10.00) B. Mathematical reasoning ability.(ratio:30.00) C. Implementing computer systems ability.(ratio:20.00) D. Computer networking application skills.(ratio:10.00) E. Professional skills for information technology (IT) industry.(ratio:30.00) 			
Subject Schoolwide essential virtues			
<ul style="list-style-type: none"> 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	<p>This course provides a broad introduction to machine learning, data mining, and statistical pattern recognition. In this class, you will learn about the most effective machine learning techniques, and gain practice implementing them and getting them to work for yourself. The course will also draw from numerous case studies and applications, so that you'll also learn how to apply learning algorithms to text understanding (web search, anti-spam), computer vision, medical informatics, and other areas. This course does not require any prior Machine Learning experience.</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	Concepts of supervised machine learning models for prediction and binary classification tasks, including linear regression and logistic regression.	Cognitive
2	Concepts of advanced learning algorithms: neural network.	Cognitive
3	Advice for applying machine learning, machine learning system design.	Cognitive
4	Concepts of recommender systems.	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABE	124568	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)
2	BCDE	25	Lecture, Discussion, Experience	Study Assignments, Discussion(including classroom and online)
3	ABCDE	2357	Lecture, Discussion, Experience	Testing, Discussion(including classroom and online), Practicum

4	AE	25	Lecture, Discussion	Discussion(including classroom and online), Practicum
Course Schedule				
Week	Date	Course Contents		Note
1	112/02/13 ~ 112/02/19	Course introduction, introduction to machine learning		
2	112/02/20 ~ 112/02/26	Supervised learning, unsupervised learning		In-class assignment
3	112/02/27 ~ 112/03/05	Linear regression with one variable		
4	112/03/06 ~ 112/03/12	Linear algebra review		In-class assignment
5	112/03/13 ~ 112/03/19	Linear regression with multiple variables		
6	112/03/20 ~ 112/03/26	Logistic regression		
7	112/03/27 ~ 112/04/02	Regularization		
8	112/04/03 ~ 112/04/09	Neural network (1)		
9	112/04/10 ~ 112/04/16	Neural network (2)		
10	112/04/17 ~ 112/04/23	Midterm Exam Week		
11	112/04/24 ~ 112/04/30	Advice for applying machine learning, machine learning system design		In-class assignment
12	112/05/01 ~ 112/05/07	Support Vector Machines, clustering		
13	112/05/08 ~ 112/05/14	Dimensionality reduction		
14	112/05/15 ~ 112/05/21	Recommender systems, large scale machine learning		
15	112/05/22 ~ 112/05/28	Final report presentation		
16	112/05/29 ~ 112/06/04	Final report presentation		
17	112/06/05 ~ 112/06/11	Final report presentation		
18	112/06/12 ~ 112/06/18	Final Exam Week		
Requirement				

Teaching Facility	Computer, Projector
Textbooks and Teaching Materials	We will mainly use online resources as the teaching material. Pattern Recognition and Machine Learning, Christopher Bishop. http://cs229.stanford.edu/
References	
Number of Assignment(s)	(Filled in by assignment instructor only)
Grading Policy	<ul style="list-style-type: none"> ◆ Attendance : 10.0 % ◆ Mark of Usual : % ◆ Midterm Exam : 30.0 % ◆ Final Exam : 45.0 % ◆ Other (assignment) : 15.0 %
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>