

## Tamkang University Academic Year 112, 2nd Semester Course Syllabus

Course Title	MACHINE LEARNING APPLICATIONS AND EXAMPLES	Instructor	TSENG, YAO-TING
Course Class	TLSAM1A MASTER'S PROGRAM IN DATA SCIENCE, DEPARTMENT OF STATISTICS, 1A	Details	<ul style="list-style-type: none"> <li>◆ General Course</li> <li>◆ Selective</li> <li>◆ One Semester</li> </ul>
Relevance to SDGs	SDG4 Quality education		
Departmental Aim of Education			
Cultivate cross-field data science analyst who integrate statistics and information science to provide effective decision-making methods and strategies in different professional fields, thereby creating the greatest application value of data.			
Subject Departmental core competences			
<ul style="list-style-type: none"> <li>A. Data analysis ability.(ratio:50.00)</li> <li>B. Information application ability.(ratio:20.00)</li> <li>C. Logical reasoning ability.(ratio:10.00)</li> <li>D. Ability to integrate knowledge in various fields.(ratio:20.00)</li> </ul>			
Subject Schoolwide essential virtues			
<ul style="list-style-type: none"> <li>1. A global perspective. (ratio:10.00)</li> <li>2. Information literacy. (ratio:30.00)</li> <li>3. A vision for the future. (ratio:10.00)</li> <li>4. Moral integrity. (ratio:5.00)</li> <li>5. Independent thinking. (ratio:30.00)</li> <li>6. A cheerful attitude and healthy lifestyle. (ratio:5.00)</li> <li>7. A spirit of teamwork and dedication. (ratio:5.00)</li> <li>8. A sense of aesthetic appreciation. (ratio:5.00)</li> </ul>			

<b>Course Introduction</b>	<p>This course will introduce the fundamentals of machine learning and provide hands-on experience. Students will learn how to implement machine learning models using software such as SAS Viya and Python. The course covers topics including the basic concepts and terminology of machine learning, as well as supervised learning models such as logistic regression, decision trees, and support vector machines. Students will also learn techniques for model evaluation and optimization, such as data splitting skill and cross-validation test.</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	Understand machine learning model and understand flow with analytic cycle.	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCD	12345678	Lecture, Discussion	Testing

**Course Schedule**

Week	Date	Course Contents	Note
1	113/02/19 ~ 113/02/25	Introduction	
2	113/02/26 ~ 113/03/03	228 Peace Memorial Day	
3	113/03/04 ~ 113/03/10	Data Preparation	
4	113/03/11 ~ 113/03/17	Data Preparation	
5	113/03/18 ~ 113/03/24	Decision Trees and Ensembles of Trees	
6	113/03/25 ~ 113/03/31	Decision Trees and Ensembles of Trees	

7	113/04/01 ~ 113/04/07	Neural Networks	
8	113/04/08 ~ 113/04/14	Support Vector Machines and Additional Topics	
9	113/04/15 ~ 113/04/21	Midterm Exam	
10	113/04/22 ~ 113/04/28	Model Assessment and Deployment	
11	113/04/29 ~ 113/05/05	Feature Engineering	
12	113/05/06 ~ 113/05/12	Feature Engineering	
13	113/05/13 ~ 113/05/19	Clustering of Variables and Observations	
14	113/05/20 ~ 113/05/26	Anomaly Detection	
15	113/05/27 ~ 113/06/02	External Models in Model Studio	
16	113/06/03 ~ 113/06/09	Machine Learning Automation	
17	113/06/10 ~ 113/06/16	Final Exam	
18	113/06/17 ~ 113/06/23	Flex week, learning activities should be arranged.	
Key capabilities			
Interdisciplinary			
Distinctive teaching			
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:Textbooks Name of teaching materials: Machine Learning using SAS Viya	

References	The Model Thinker: what you need to know to make data work for you (Scott E. Page)
Grading Policy	<p>◆ Attendance :            %    ◆ Mark of Usual :            %    ◆ Midterm Exam : 50.0 %</p> <p>◆ Final Exam :    50.0 %</p> <p>◆ Other (    ) :            %</p>
Note	<p>This syllabus may be uploaded at the website of Course Syllabus Management System at <a href="http://info.ais.tku.edu.tw/csp">http://info.ais.tku.edu.tw/csp</a> or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at <a href="http://www.acad.tku.edu.tw/CS/main.php">http://www.acad.tku.edu.tw/CS/main.php</a>.</p> <p><b>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</b></p>