Tamkang University Academic Year 112, 2nd Semester Course Syllabus

Course Title	HIGH DIMENSIONAL GRAPHICS	Instructor	KAO CHIUN HOW
Course Class	TLSAM1A MASTER'S PROGRAM IN DATA SCIENCE, DEPARTMENT OF STATISTICS, 1A	Details	◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	SDG4 Quality education SDG8 Decent work and economic growth		

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

A. Data analysis ability.(ratio:40.00)

B. Information application ability.(ratio:30.00)

C. Logical reasoning ability.(ratio:10.00)

D. Ability to integrate knowledge in various fields.(ratio:20.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:10.00)

2. Information literacy. (ratio:30.00)

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

4. Moral integrity. (ratio:10.00)

5. Independent thinking. (ratio:20.00)

6. A cheerful attitude and healthy lifestyle. (ratio:5.00)

7. A spirit of teamwork and dedication. (ratio:10.00)

8. A sense of aesthetic appreciation. (ratio:5.00)

	Course Introduction	The purpose of this course is to introduce the techniques of high-dimensional data visualization. Students taken this course can understand the dimensionality reduction techniques and visualizations, dimension free data visualizations, clustering methods, data pre-processing, related software and tools, etc.Additionally, relevant analysis methods and visualization tools for symbolic data analysis will be introduced.

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	Basic theories and concepts of high dimensional data visualization.	Cognitive
2	Can use softwares or tools to visualize high dimensional dataset.	Cognitive
3	Understand the visualization methods for high dimensional data in other data types.	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	Study Assignments, Discussion(including classroom and online), Report(including oral and written)
2	ABCD	12345678	Lecture	Study Assignments, Discussion(including classroom and online), Report(including oral and written)
3	ABCD	12345678	Lecture	Study Assignments, Discussion(including classroom and online), Report(including oral and written)

Course Schedule			
Week	Date	Course Contents	Note
1	113/02/19 ~ 113/02/25	Introduction	
2	113/02/26 ~ 113/03/03	High dimensional data	
3	113/03/04 ~ 113/03/10	High dimensional data visualization	
4	113/03/11 ~ 113/03/17	Generalized Association Plots (GAP)	
5	113/03/18 ~ 113/03/24	GAP Software	
6	113/03/25 ~ 113/03/31	Study case for GAP	
7	113/04/01 ~ 113/04/07	Spring Break	
8	113/04/08 ~ 113/04/14	Dimension reduction methods	
9	113/04/15 ~ 113/04/21	Interim Report	
10	113/04/22 ~ 113/04/28	Dimension reduction methods	
11	113/04/29 ~ 113/05/05	High dimensional categorical data	
12	113/05/06 ~ 113/05/12	High dimensional categorical data visualization	
13	113/05/13 ~ 113/05/19	Categorical Generalized Association Plots (cGAP)	
14	113/05/20 ~ 113/05/26	Study case for cGAP	
15	113/05/27 ~ 113/06/02	Symbolic data analysis (SDA)	
16	113/06/03 ~ 113/06/09	Visualization for SDA	
17	113/06/10 ~ 113/06/16	Interval-type Generalized Association Plots (iGAP)	
18	113/06/17 ~ 113/06/23	Final Project Presentation	
Key capabilities	self-directed learning Information Technology Problem solving		
Interdisciplinary			

Distinctive teaching	
Course Content	Computer programming or Computer language (students have hands-on experience in related projects) Logical Thinking
Requirement	
Textbooks and Teaching Materials	Self-made teaching materials:Presentations
References	
Grading Policy	◆ Attendance： 10.0 ％ ◆ Mark of Usual：20.0 ％ ◆ Midterm Exam： 30.0 ％ ◆ Final Exam： 40.0 ％ ◆ 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.**