Tamkang University Academic Year 114, 1st Semester Course Syllabus

Course Title	LINEAR ALGEBRA	Instructor	MAN-HUA CHEN
Course Class	ULSXB2B DEPARTMENT OF STATISTICS AND DATA SCIENCE, 2B	Details	◆ General Course ◆ Required ◆ 1st Semester ◆ 2 Credits
Relevance to SDGs	SDG4 Quality education		

Departmental Aim of Education

Ⅰ. Cultivate students with knowledge of basic statistical theory.

Ⅱ. Cultivate students with data analysis skills.

Ⅲ. Cultivate students to become statistical professionals with management capabilities.

Subject Departmental core competences

A. Knowledge of basic statistical theory.(ratio:5.00)

B. Logical reasoning in mathematics.(ratio:80.00)

C. Data analysis skills.(ratio:5.00)

D. Application of profession knowledge.(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:30.00)

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

7. A spirit of teamwork and dedication. (ratio:5.00)

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

	Course Introduction	This course introduces the techniques for solving a linear system of equations, matrix algebra, basic theory, and vector spaces, including the inner product spaces. It also introduces the eigenvalue problems and the diagonalization of a matrix. All of these topics are useful in statistical applications and many other fields.

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	Students can understand the solution of linear systems, matrix algebra, determinants, and definition of a vector space and use the basis and dimension of a vector space and the rank of a matrix in many applications.	Cognitive
2	Students can calculate eigenvalues and eigenvectors and understand the diagonalization of a symmetric matrix. They can also describe the meaning of a linear transformation and its fundamental properties, the kernel and range of a linear transformation, and an inner product space.	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	Testing, Discussion(including classroom and online), Activity Participation
2	ABCD	12345678	Lecture	Testing, Discussion(including classroom and online), Activity Participation

Course Schedule			
Week	Date	Course Contents	Note
1	114/09/15～114/09/21	CHAPTER 1: Linear Equations and Vectors of Rn	
2	114/09/22～114/09/28	CHAPTER 1: Linear Equations and Vectors of Rn	
3	114/09/29～114/10/05	CHAPTER 1: Linear Equations and Vectors of Rn	
4	114/10/06～114/10/12	CHAPTER 1: Linear Equations and Vectors of Rn	
5	114/10/13～114/10/19	CHAPTER 1: Linear Equations and Vectors of Rn	
6	114/10/20～114/10/26	CHAPTER 2: Matrices and Linear transformations	
7	114/10/27～114/11/02	CHAPTER 2: Matrices and Linear transformations	
8	114/11/03～114/11/09	Midterm Exam Week	
9	114/11/10～114/11/16	Midterm Exam Week	
10	114/11/17～114/11/23	CHAPTER 2: Matrices and Linear transformations	
11	114/11/24～114/11/30	CHAPTER 2: Matrices and Linear transformations	
12	114/12/01～114/12/07	CHAPTER 2: Matrices and Linear transformations	
13	114/12/08～114/12/14	CHAPTER 3: Determinants and Eigenvectors	
14	114/12/15～114/12/21	CHAPTER 3: Determinants and Eigenvectors	
15	114/12/22～114/12/28	CHAPTER 3: Determinants and Eigenvectors	
16	114/12/29～115/01/04	Final Week of Final Exam	
17	115/01/05～115/01/11	Flexible Teaching Week for Teachers	
18	115/01/12～115/01/18	Flexible Teaching Week for Teachers	
Key capabilities		self-directed learning Problem solving	
Interdisciplinary		STEAM course (S:Science, T:Technology, E:Engineering, M:Math, A field:Integration of Art and Humanist)	

Distinctive teaching	Special/Problem-Based(PBL) Courses
Course Content	Logical Thinking
Requirement	
Textbooks and Teaching Materials	Self-made teaching materials:Handouts, Videos Using teaching materials from other writers:Textbooks Name of teaching materials: Elementary Linear Algebra 12/e Asia Edition, Anton 2019
References	
Grading Policy	◆ Attendance： 　　 %　 ◆ Mark of Usual：20.0 %　 ◆ Midterm Exam： 30.0 % ◆ Final Exam： 30.0 % ◆ Other〈TA class〉：20.0 %
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at https://web2.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. ※"Adhere to the concept of intellectual property rights" and "Do not illegally photocopy, download, or distribute." Using original textbooks is advised. It is a crime to improperly photocopy others' publications.