Tamkang University Academic Year 111, 2nd Semester Course Syllabus

Course Title	LINEAR ALGEBRA	Instructor	WU SHU-FEI
Course Class	TLSXB2C DEPARTMENT OF STATISTICS, 2C	Details	◆ General Course ◆ Required ◆ 2nd Semester
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 in solving a linear system of equations, the matrix algebra and basic theory, the 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 are able to understand the definition of a vector space and able to use the basis and dimension of a vector space and the rank of a matrix in many applications.	Cognitive
2	Students are able to calculate eigenvalues and eigenvectors and understand the diagonalization of a symmetric matrix;to describe the meaning of a linear transformation and its fundamental properties; Students are also able to describe the kernel and range of a linear transformation;to describe 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, Study Assignments
2	ABCD	12345678	Lecture	Testing

Course Schedule			
Week	Date	Course Contents	Note
1	112/02/13 ~ 112/02/19	Chapter 3: Vector spaces	
2	112/02/20 ~ 112/02/26	3.1 Definition of a vector space 3.2 Subspaces	
3	112/02/27 ~ 112/03/05	3.3 Basis and dimension	
4	112/03/06 ~ 112/03/12	3.4 Coordinates and Change of basis	
5	112/03/13 ~ 112/03/19	3.4 Coordinates and Change of basis	
6	112/03/20 ~ 112/03/26	Chapter 4: Linear Transformations	
7	112/03/27 ~ 112/04/02	教學行政觀摩	
8	112/04/03 ~ 112/04/09	4.1 Linear transformations	
9	112/04/10 ~ 112/04/16	4.2 Null space and ranges	
10	112/04/17 ~ 112/04/23	Midterm Exam Week	
11	112/04/24 ~ 112/04/30	Chapter 5: Eigenvalues and eigenvectors	
12	112/05/01 ~ 112/05/07	Chapter 5: Eigenvalues and eigenvectors	
13	112/05/08 ~ 112/05/14	5.1 Eigenvalues and eigenvectors	
14	112/05/15 ~ 112/05/21	5.2 Diagonalization	
15	112/05/22 ~ 112/05/28	5.2 Diagonalization	
16	112/05/29 ~ 112/06/04	Chapter 6: Inner product spaces	if time permitting
17	112/06/05 ~ 112/06/11	Chapter 6: Inner product spaces	if time permitting
18	112/06/12 ~ 112/06/18	Final Exam Week	

Requirement	※請關掉手機或轉震動 ※上課不可使用notebook或平版電腦,違規者學期總分扣五分 ※上課不可吃東西,上課說話太大聲影響上課者,學期總分扣五分 ※請使用正版教科書，勿非法影印他人著作，以免觸法
Teaching Facility	Computer, Projector
Textbooks and Teaching Materials	Introduction to Linear Algebra: with Applications. DeFranza and Gagliardi 2009. 新月書局·
References	1. Linear Algebra with Applications. Gareth Williams. 滄海書局·2019年第9版 2. 初等線性代數與應用,原著:Anton 9th Edition, 簡國清譯.

Number of Assignment(s)	(Filled in by assignment instructor only)
Grading Policy	◆ Attendance： 20.0 % ◆ Mark of Usual： % ◆ Midterm Exam： 30.0 % ◆ Final Exam： 30.0 % ◆ Other〈助教實習〉：20.0 %
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.**