

## Tamkang University Academic Year 109, 2nd Semester Course Syllabus

Course Title	LINEAR ALGEBRA	Instructor	WU SHU-FEI
Course Class	TLSXB2C DEPARTMENT OF STATISTICS, 2C	Details	<ul style="list-style-type: none"> <li>◆ General Course</li> <li>◆ Required</li> <li>◆ 2nd Semester</li> </ul>
Relevance to SDGs	SDG4 Quality education		
<b>Departmental Aim of Education</b>			
<p>I. Cultivate students with knowledge of basic statistical theory.</p> <p>II. Cultivate students with data analysis skills.</p> <p>III. Cultivate students to become statistical professionals with management capabilities.</p>			
<b>Subject Departmental core competences</b>			
B. Logical reasoning in mathematics.(ratio:100.00)			
<b>Subject Schoolwide essential virtues</b>			
<p>1. A global perspective. (ratio:5.00)</p> <p>5. Independent thinking. (ratio:95.00)</p>			
Course Introduction	<p>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.</p>		

**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 solution of linear system, matrix algebra, determinant and 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	B	15	Lecture	Testing
2	B	15	Lecture	Testing

**Course Schedule**

Week	Date	Course Contents	Note
1	110/02/22 ~ 110/02/28	CHAPTER 3: Determinants and Eigenvectors	
2	110/03/01 ~ 110/03/07	CHAPTER 3: Determinants and Eigenvectors	
3	110/03/08 ~ 110/03/14	CHAPTER 3: Determinants and Eigenvectors	
4	110/03/15 ~ 110/03/21	CHAPTER 3: Determinants and Eigenvectors	
5	110/03/22 ~ 110/03/28	CHAPTER 4 General Vector Space ( 廣義向量空間 )	

6	110/03/29 ~ 110/04/04	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
7	110/04/05 ~ 110/04/11	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
8	110/04/12 ~ 110/04/18	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
9	110/04/19 ~ 110/04/25	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
10	110/04/26 ~ 110/05/02	Midterm Exam Week	
11	110/05/03 ~ 110/05/09	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
12	110/05/10 ~ 110/05/16	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
13	110/05/17 ~ 110/05/23	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
14	110/05/24 ~ 110/05/30	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
15	110/05/31 ~ 110/06/06	CHAPTER 5: Coordinate Representations and Diagonalization of matrix	
16	110/06/07 ~ 110/06/13	CHAPTER 5: Coordinate Representations and Diagonalization of matrix	
17	110/06/14 ~ 110/06/20	CHAPTER 6: Inner product space	if time permitting
18	110/06/21 ~ 110/06/27	Final Exam Week	
Requirement	※請關掉手機或轉震動 ※上課不可使用notebook或平板電腦,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	Linear Algebra with Applications. Gareth Williams. 滄海書局·2019年第9版		
References	Introduction to Linear Algebra: with Applications. DeFranza and Gagliardi. 東華書局·初等線性代數與應用,原著:Anton 9th Edition, 簡國清譯. Elementary Linear Algebra with Supplemental Applications, 11th Edition. Howard Anton, Chris Rorres 歐亞書局·		
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	<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>
------	---