

## Tamkang University Academic Year 113, 2nd Semester Course Syllabus

Course Title	LINEAR ALGEBRA	Instructor	WU SHU-FEI
Course Class	TLSXB2A DEPARTMENT OF STATISTICS, 2A	Details	<ul style="list-style-type: none"> <li>◆ General Course</li> <li>◆ Required</li> <li>◆ 2nd Semester</li> <li>◆ 2 Credits</li> </ul>
Relevance to SDGs	SDG4 Quality education		
D e p a r t m e n t a l   A i m   o f   E d u c a t i o n			
<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>			
S u b j e c t   D e p a r t m e n t a l   c o r e   c o m p e t e n c e s			
<p>A. Knowledge of basic statistical theory.(ratio:5.00)</p> <p>B. Logical reasoning in mathematics.(ratio:80.00)</p> <p>C. Data analysis skills.(ratio:5.00)</p> <p>D. Application of profession knowledge.(ratio:10.00)</p>			
S u b j e c t   S c h o o l w i d e   e s s e n t i a l   v i r t u e s			
<p>1. A global perspective. (ratio:10.00)</p> <p>2. Information literacy. (ratio:20.00)</p> <p>3. A vision for the future. (ratio:10.00)</p> <p>4. Moral integrity. (ratio:10.00)</p> <p>5. Independent thinking. (ratio:30.00)</p> <p>6. A cheerful attitude and healthy lifestyle. (ratio:10.00)</p> <p>7. A spirit of teamwork and dedication. (ratio:5.00)</p> <p>8. A sense of aesthetic appreciation. (ratio:5.00)</p>			

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.
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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	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	ABCD	12345678	Lecture	Testing
2	ABCD	12345678	Lecture	Testing

Course Schedule			
Week	Date	Course Contents	Note
1	114/02/17 ~ 114/02/23	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
2	114/02/24 ~ 114/03/02	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
3	114/03/03 ~ 114/03/09	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
4	114/03/10 ~ 114/03/16	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
5	114/03/17 ~ 114/03/23	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
6	114/03/24 ~ 114/03/30	CHAPTER 4 General Vector Space ( 廣義向量空間 )	
7	114/03/31 ~ 114/04/06	Class break	
8	114/04/07 ~ 114/04/13	CHAPTER 5: Coordinate Representations and Diagonalization of matrix	
9	114/04/14 ~ 114/04/20	Midterm Exam/Midterm Assessment Week (teachers can adjust the week as needed)	
10	114/04/21 ~ 114/04/27	CHAPTER 5: Coordinate Representations and Diagonalization of matrix	
11	114/04/28 ~ 114/05/04	CHAPTER 5: Coordinate Representations and Diagonalization of matrix	
12	114/05/05 ~ 114/05/11	CHAPTER 5: Coordinate Representations and Diagonalization of matrix	
13	114/05/12 ~ 114/05/18	CHAPTER 6 Inner product space	
14	114/05/19 ~ 114/05/25	CHAPTER 6 Inner product space	
15	114/05/26 ~ 114/06/01	CHAPTER 6 Inner product space	
16	114/06/02 ~ 114/06/08	CHAPTER 6 Inner product space	
17	114/06/09 ~ 114/06/15	Final Exam/Final Assessment Week (teachers can adjust the week as needed)	if time permitting
18	114/06/16 ~ 114/06/22	Flexible Teaching Week: Generally, no in-person classes; teachers may arrange teaching activities or final assessments, among other options.	
Key capabilities		Information Technology	

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	<p>※請关掉手機或轉震動</p> <p>※上課不可使用notebook或平板電腦,違規者學期總分扣五分</p> <p>※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</p> <p>※請使用正版教科書·勿非法影印他人著作·以免觸法</p>
Textbooks and Teaching Materials	<p>Self-made teaching materials:Textbooks, Handouts</p> <p>Name of teaching materials: Linear Algebra: with Applications 9/e, 2019, Williams,滄海書局</p> <p>Using teaching materials from other writers:Textbooks</p>
References	<p>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.</p> <p>Elementary Linear Algebra with Supplemental Applications, 11th Edition. Howard Anton, Chris Rorres 歐亞書局·</p>
Grading Policy	<p>◆ Attendance : 20.0 %    ◆ Mark of Usual :        %    ◆ Midterm Exam : 30.0 %</p> <p>◆ Final Exam : 30.0 %</p> <p>◆ Other (助教實習) : 20.0 %</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>