

Tamkang University Academic Year 113, 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"> ◆ General Course ◆ Required ◆ 2nd Semester ◆ 2 Credits
Relevance to SDGs	SDG4 Quality education		
Departmental Aim of Education			
<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>			
Subject Departmental core competences			
<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>			
Subject Schoolwide essential virtues			
<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 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.</p> <p>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</p>