

Tamkang University Academic Year 111, 1st 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 ◆ 1st Semester
Relevance to SDGs	SDG4 Quality education		
Departmental Aim of Education			
<ul style="list-style-type: none"> 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			
<ul style="list-style-type: none"> 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			
<ul style="list-style-type: none"> 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.
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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, Study Assignments
2	ABCD	12345678	Lecture	Testing, Study Assignments

Course Schedule			
Week	Date	Course Contents	Note
1	111/09/05 ~ 111/09/11	CHAPTER 1: System of Linear Equations and Matrices	
2	111/09/12 ~ 111/09/18	1.1: System of Linear Equations	
3	111/09/19 ~ 111/09/25	1.2: Matrices and Elementary Row Operations	
4	111/09/26 ~ 111/10/02	1.3 Matrix Algebra	
5	111/10/03 ~ 111/10/09	1.4 The Inverse of a Square Matrix	
6	111/10/10 ~ 111/10/16	1.5 Matrix Equations	
7	111/10/17 ~ 111/10/23	1.6 Determinants	
8	111/10/24 ~ 111/10/30	1.6 Determinants	
9	111/10/31 ~ 111/11/06	1.7 Elementary Matrices and LU Factorization	
10	111/11/07 ~ 111/11/13	Midterm Exam Week	
11	111/11/14 ~ 111/11/20	1.7 Elementary Matrices and LU Factorization	
12	111/11/21 ~ 111/11/27	1.8 Applications of Systems of Linear Equations	
13	111/11/28 ~ 111/12/04	CHAPTER 2: Linear Combinations and Linear Independence	
14	111/12/05 ~ 111/12/11	2.1 Vectors in R^n	
15	111/12/12 ~ 111/12/18	2.2 Linear Combinations	
16	111/12/19 ~ 111/12/25	2.3 Linear Independence	
17	111/12/26 ~ 112/01/01	CHAPTER 3: Vector Space and Subspaces	if time permitting
18	112/01/02 ~ 112/01/08	Final Exam Week	
Requirement	※請关掉手機或轉震動 ※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	Introduction to Linear Algebra: with Applications. DeFranza and Gagliardi. 新月書局		

References	Linear Algebra with Applications. Gareth Williams. 滄海書局·2019年第9版 Elementary Linear Algebra with Supplemental Applications, 12th Edition. Howard Anton, Chris Rorres 滄海書局
Number of Assignment(s)	2 (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.