Tamkang University Academic Year 112, 2nd Semester Course Syllabus

Course Title	LINEAR ALGEBRA	Instructor	JEONG JAESIK
Course Class	TKFXB1B DEPARTMENT OF ARTIFICIAL INTELLIGENCE, 1B	Details	◆ General Course ◆ Required ◆ One Semester
Relevance to SDGs	SDG4 Quality education SDG9 Industry, Innovation, and Infrastructure SDG17 Partnerships for the goals		

Departmental Aim of Education

Ⅰ. Students may analyze problems in applied science based on the fundamental knowledge of programming, mathematics, and artificial intelligence.

Ⅱ. Students may plan and implement an AI system following the procedures of problem analysis, experiment testing, data visualizing, derivation and deduction.

Ⅲ. Educate the students to be AI engineers who may accomplish their missions indepedently and may collaborate with their colleagues in the workplace.

Ⅳ. Students may have basic skills and global competence for career diversification, and may keep lifelong learning.

Subject Departmental core competences

A. Professional analysis.(ratio:65.00)

B. Practical application.(ratio:20.00)

C. Professional attitude.(ratio:10.00)

D. Global Mobility.(ratio:5.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:5.00)

2. Information literacy. (ratio:30.00)

3. A vision for the future. (ratio:10.00)

4. Moral integrity. (ratio:5.00)

5. Independent thinking. (ratio:30.00)

6. A cheerful attitude and healthy lifestyle. (ratio:5.00)

7. A spirit of teamwork and dedication. (ratio:10.00)

8. A sense of aesthetic appreciation. (ratio:5.00)

Course Introduction	Linear Algebra is a foundational course for students in mathematics, engineering, and the sciences. This course explores the core concepts of vector spaces, matrices, determinants, eigenvalues, and eigenvectors. Through a combination of theoretical understanding and practical applications, students will learn how to solve linear equations, perform vector operations, and understand linear transformations. This course involves the basics for further study in higher mathematics and provides essential mathematics for various applied 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	1. Enhancing Analytical Skills 2. Foundation for Advanced Studies 3. Bridging Theory and Practice	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, Discussion	Testing, Study Assignments

Course Schedule

Week	Date	Course Contents	Note
1	113/02/19 ~ 113/02/25	Introduction to Systems of Linear Equations	
2	113/02/26 ~ 113/03/03	Gaussian Elimination and Gauss-Jordan Elimination, Operations with Matrices	
3	113/03/04 ~ 113/03/10	Properties of Matrix operations, The Inverses of a Matrix	
4	113/03/11 ~ 113/03/17	Elementary Matrices, Markov Chains	
5	113/03/18 ~ 113/03/24	The Determinant of a Matrix	

6	113/03/25 ~ 113/03/31	Determinants and Elementary Operations, Properties of Determinants	
7	113/04/01 ~ 113/04/07	Holidays (Children's Day, Tomb Sweeping Day)	
8	113/04/08 ~ 113/04/14	Vectors in Rn, Vector Spaces	
9	113/04/15 ~ 113/04/21	Midterm Exam Week	
10	113/04/22 ~ 113/04/28	Subspaces of Vector Spaces, Spanning Sets and Linear Independence	
11	113/04/29 ~ 113/05/05	Basic and Dimension, Rank of a Matrix and Systems of Linear Equations	
12	113/05/06 ~ 113/05/12	Coordinates and Change of Basis, Length and Dot Product in Rn	
13	113/05/13 ~ 113/05/19	Inner Product Spaces, Orthonormal Bases: Gram-Schmidt Process	
14	113/05/20 ~ 113/05/26	Mathematical Models and Least Squares Analysis, Introduction to Linear Transformations	
15	113/05/27 ~ 113/06/02	The Kernel and Range of a Linear Transformation, Transition Matrices and Similarity	
16	113/06/03 ~ 113/06/09	Eigenvalues and Eigenvectors, Diagonalization	
17	113/06/10 ~ 113/06/16	Final Exam Week (Date:113/6/11-113/6/17)	
18	113/06/17 ~ 113/06/23	Flex week, learning activities should be arranged.	
Key capabilities	self-directed learning International mobility Problem solving		
Interdisciplinary			
Distinctive teaching			
Course Content	Logical Thinking		

Requirement	
Textbooks and Teaching Materials	Using teaching materials from other writers:Textbooks Name of teaching materials: Elementary Linear Algebra 8th Edition - Ron Larson
References	
Grading Policy	◆ Attendance： 20.0 % ◆ Mark of Usual：20.0 % ◆ Midterm Exam： 30.0 % ◆ Final Exam： 30.0 % ◆ Other〈 〉： %
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.**