

SCMA 259 Linear Algebra
First Semester Academic Year 2025-2026
Faculty of Science, Mahidol University

Student Groups Materials Science and Nano Engineering, Bioresources and Environmental Biology, and Industrial Mathematics

Class Schedule Thursday at 13:30-16:30

Instructors Dr. Piyanan Pasom
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Course Description

Vector spaces, Linear transformations, Inner product spaces, projections on to subspaces, Least squares, Eigenvalues and eigenvectors, Diagonalization and Jordan forms, Complex vector spaces, Singular value decomposition and the pseudoinverse, Systems of linear differential equations.

Grading Policy

Student evaluation is in accordance with the rules and regulations of the Faculty of Science, Mahidol University. Letter grades of A, B+, B, C+, C, D+, D, and F will be evaluated according to the student's score.

Score consists of:	Midterm Exam	35%	Quiz	10%
	Final Exam	35%	Assignments	20%

All students are required

- To come to class on-time and have an attendance record of 80% for the whole course.
Otherwise students will not be allowed to take the examination.
- To dress properly. Otherwise students will not be allowed to sit in the class.

Course Timetable

Week	Topic/Details	Number of hours		Methods: Teaching Media	Instructors
		Theory*	Practice**		
1	System of Linear Equations, Gaussian elimination	3	0		Dr. Piyanan Pasom

Week	Topic/Details	Number of hours		Methods: Teaching Media	Instructors
		Theory*	Practice**		
	Gauss-Jordan Method			Teaching method: Interactive lecture, effective questioning, formative assessment, problem solving method Media: lecture notes, individual assignments	
2	Vector spaces and Subspaces, Linear Independence,	3	0		
3	Span, Basis and Dimension	3	0		
4	Fundamental Subspaces of Matrices	3	0		
5	Fundamental Subspaces of Matrices (continued) ***** Linear Transformations - Basic Definition and Examples	3	0		
6	- Matrices Representation for Linear Transformations Scalar Product and Orthogonality in the Euclidean Space $\mathbb{R}^n$	3	0		
7	- Orthogonal Subspaces	3	0		
8	- Projections onto Subspaces, - Least Squares Problems	3	0		
9	Midterm examination				
10	Inner Product Spaces	3	0		

Week	Topic/Details	Number of hours		Methods: Teaching Media	Instructors
		Theory*	Practice**		
	- Basic Definitions and Its Properties				
11	-Orthogonal and Orthonormal Bases Eigenvalues and Eigenvectors	3	0	Teaching method: Interactive lecture, effective questioning, formative assessment, problem solving method Media: lecture notes, individual assignments	Dr. Piyanan Pasom
12	Diagonalization and Jordan Forms	3	0		
13	Complex vector spaces, Complex Eigenvalues and Eigenvectors	3	0		
14	Hermitian and Unitary Matrices Unitarily Diagonalization	3	0		
15	The Singular Value Decomposition and Pseudoinverse of Matrices	3	0		
16	Systems of Linear Differential Equations	3	0		
17	Final examination				
	Total hours of the entire semester	45	0		

Textbooks

- Howard Anton and Chris Rorres. **Elementary Linear Algebra with Applications**. 10th Ed. New York: Wiley. 2010.
- Steve Leon, **Linear Algebra with Applications**, 8th Ed., Pearson, 2009