



MODULE HANDBOOK LINEAR ALGEBRA

**BACHELOR DEGREE PROGRAM
DEPARTMENT OF MATHEMATICS
FACULTY OF SCIENCE AND DATA ANALYTICS
INSTITUT TEKNOLOGI SEPULUH NOPEMBER**

MODULE HANDBOOK

LINEAR ALGEBRA

Module name	Linear Algebra	
Module level	Undergraduate	
Code	KM184702	
Course (if applicable)	Linear Algebra	
Semester	Fall (Gasal)	
Person responsible for the module	Dian Winda S., S.Si, M.Si	
Lecturer	Prof. Dr. Drs. Subiono, MS Dian Winda S., S.Si, M.Si	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergraduate degree program, mandatory , 7 th semester.	
Type of teaching, contact hours	Lectures, <60 students Tuesdays, 11.00-12.50 (GMT+7)	
Workload	<ol style="list-style-type: none"> 1. Lectures : 3 x 50 = 150 minutes per week. 2. Exercises and Assignments : 3 x 60 = 180 minutes (3 hours) per week. 3. Private learning : 3 x 60 = 180 minutes (3 hours) per week. 	
Credit points	3 credit points (sks)	
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.	
Mandatory prerequisites	-	
Learning outcomes and their corresponding PLOs	<p>Course Learning Outcome (CLO) after completing this module,</p> <p>CLO 1: Students are able to follow developments and apply mathematics and are able to communicate actively and correctly both orally and in writing</p> <p>CLO 2: Students are able to develop further understanding that has been obtained mainly related to advanced mathematics and apply it either in the field of mathematics itself or others and the ability to manipulate mathematical computations numerically and symbolically related to the matrix.</p>	

	<p>CLO 3: Students are able to construct a real vector space from a group and give an example of a group which is not a vector space.</p> <p>CLO 4: S Students have a special ability and are able to process enough ideas to support the next study in accordance with the field of interest.</p> <p>CLO 5: Students be able to find orthogonal diagonalization of a symmetric matrix</p> <p>CLO 6: Students are able to find a solution of a linear equation which builds from a problem which has no exact solution by projection or general invers.</p> <p>CLO 7: Students are able to present their scientific understanding in Linear Algebra independently or in teamwork.</p>	
Content	<p>The discussion of the Linear Algebra course includes the study of the set of spans, Linear and base independent, dimensions, direct sums, ordered coordinates and bases, Linear mapping in vector space, Linear mapping and matrix algebra, changes in bases, ranks, determinants and inverses, echelon form of a matrix , eigenvectors and eigenvalues, matrix diagonalization, orthogonality, general inverse. Application of linear algebra is an integrated part of the presentation of lectures in class. Also in the discussion of lectures, SAGEMATH software is used to equip students to have the ability to perform numerical and symbolic computations. In the learning process in the classroom students will learn to identify problems, express mathematical ideas: graphic, symbolic numeric and express them in written form. Besides being directed to learn independently through assignments, students are directed to work together in group work.</p>	
Study and examination requirements and forms of examination	<ul style="list-style-type: none"> ● In-class exercises ● Assignment 1, 2, 3 ● Mid-term examination ● Final examination 	
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom.	
Reading list	<p>Main :</p> <ol style="list-style-type: none"> 1. Subiono, "Catatan Kuliah : ALJABAR LINIER ", Jurusan Matematika FMIPA-ITS, 2014. 2. Robert A. Beezer, "A First Course in Linear Algebra, Version 3.10", University of Puget Sound, Congruent Press, Washington, USA, (2013) 3. Gilbert Strang, "Linear Algebra and Its Applications", 4th Edition, Thomson, (2006). 	

	<p>4. C.D. Meyer, "Matrix Analysis and Applied Linear Algebra", SIAM, (2000).</p>
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Supporting :

1. David C. Lay, "Linear Algebra and Its Applications", Addison Wesley, (2002).
2. Steven J. Leon, "Linear Algebra with Applications", 7th Edition, Pearson Prentice Hall, (2006).