



INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS)  
FAKULTAS TEKNOLOGI ELEKTRO DAN INFORMATIKA CERDAS  
DEPARTEMEN TEKNIK ELEKTRO  
Program Studi Sarjana (S1) Teknik Telekomunikasi

1	<b>Nama Mata Kuliah / Course Name</b> : Aljabar Linier dan Variabel Kompleks / <i>Linear Algebra and Complex Variables</i>
2	<b>Kode Mata Kuliah / Course Code</b> : EE234102
3	<b>Kredit / Credits</b> : 3 SKS
4	<b>Semester / Semester</b> : 2

#### Deskripsi Mata Kuliah/ Course Description

Mata kuliah ini mengajarkan konsep dasar perhitungan matematika yang banyak digunakan dalam bidang ilmu teknik elektro, seperti menyelesaikan sistem persamaan linier dan penggunaan bilangan kompleks.

*This course teaches the basic concepts of mathematical calculations that are widely used in the field of electrical engineering, such as solving systems of linear equations and using complex numbers.*

#### Capaian Pembelajaran Lulusan (CPL) Yang Dibebankan Mata Kuliah/ Program Learning Outcomes Charged to The Course

1. (CPL-03) Mampu mengelola pembelajaran diri sendiri, dan mengembangkan diri sebagai pribadi pembelajar sepanjang hayat untuk bersaing di tingkat nasional, maupun internasional, dalam rangka berkontribusi nyata untuk menyelesaikan masalah dengan mengimplementasikan teknologi informasi dan komunikasi dan memperhatikan prinsip keberlanjutan serta memahami kewirausahaan berbasis teknologi  
(PLO-03) *Able to manage self-learning and develop oneself as a lifelong learner to compete at national and international levels, in order to make a real contribution to solving problems by implementing information and communication technology and paying attention to sustainability principles and understanding technology-based entrepreneurship.*
2. (CPL-08) Mampu mengetahui dan mengaplikasi metode, keahlian sesuai perkembangan terkini di bidang ilmu pengetahuan dan teknologi untuk menyelesaikan permasalahan teknik elektro dengan mengedepankan nilai-nilai universal  
(PLO-08) *Able to know and apply methods, skills according to the latest developments in the field of science and technology to solve electrical engineering problems by prioritizing universal values*

### Capaian Pembelajaran Mata Kuliah/ Course Learning Outcomes

1. Mampu menggunakan aljabar linier sebagai solusi sistem persamaan linier/ *Able to use linear algebra as a solution to a system of linear equations*
2. Mampu menjelaskan konsep dasar matriks/ *Able to explain the basic concept of matrix*
3. Mampu menjelaskan konsep dasar dan operasi bilangan kompleks/ *Able to explain the basic concepts and operations of complex numbers*
4. Mampu menunjukkan kinerja mandiri, bermutu, dan terukur dalam menganalisis/ *Able to demonstrate independent, quality, and measurable performance in analysis*
5. permasalahan teknik menggunakan konsep aljabar linier dan bilangan kompleks/ *engineering problems using the concepts of linear algebra and complex numbers*

### Pokok Bahasan/ Contents

1. Sistem Persamaan Linier dan Eliminasi Gauss/ *Systems of Linear Equations and Gaussian Elimination*
2. Determinan dan Invers Matriks, dan penyelesaian sistem persamaan linier/ *Determinants and Inverses of the Matrix, and solutions to systems of linear equations*
3. Nilai eigen dan vektor eigen/ *Eigenvalues and eigenvectors*
4. Vektor, operasi vektor/ *Vector, vector operations*
5. Divergensi, gradien, curl/ *Divergence, gradient, curl*
6. Operasi bilangan kompleks/ *Operations on complex numbers*
7. Formula euler dan fungsi hiperbolik/ *Euler's formulas and hyperbolic functions*

### Prasyarat/ Pre-requisite

### Pustaka/ Reference

Utama/ Primary :

1. Howard Anton, "Elementary Linear Algebra", 12th Ed., Wiley, 2019
2. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Ed., Wiley, 2011

Pendukung/ Support :

1. Ron Larson, "Elementary Linear Algebra", 8th Ed., Cengage Learning, 2017
2. Stephen Andrilli, "Elementary Linear Algebra", 5th Ed., Elsevier, 2016
3. James R. Kirkwood, "Elementary Linear Algebra", CRC Press, 2018
4. David C. Lay, "Linear Algebra and its Applications", 6th Ed., Pearson, 2021