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

INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS)
FACULTY OF INTELLIGENT ELECTRICAL & INFORMATICS TECHNOLOGY
DEPARTMENT OF ELECTRICAL ENGINEERING
Bachelor Degree Program in Electrical Engineering

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

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 fundamental concepts of mathematical calculations commonly used in the field of electrical engineering, such as solving systems of linear equations and the use of complex numbers.*

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

CPL 3   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 / *Able to manage one's own learning and continually self-develop as a lifelong learner to compete at the national and international levels, with the goal of making a tangible contribution to problem-solving by implementing information and communication technology and considering sustainability principles, as well as understanding technology-based entrepreneurship.*

CPL 7   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 / *Able to understanding and applying the latest methods and skills in the field of science*

and technology to solve electrical engineering problems while emphasizing universal values.

Capaian Pembelajaran Mata Kuliah / *Course Learning Outcomes*

1. Mampu menggunakan aljabar linier sebagai solusi sistem persamaan linier / *Able to use linear algebra to solve linear systems of equations.*
2. Mampu menjelaskan konsep dasar matriks / *Able to explain the basic concepts of matrices.*
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 permasalahan teknik menggunakan konsep aljabar linier dan bilangan kompleks / *Able to demonstrate independent, high-quality, and measurable performance in analyzing engineering problems using linear algebra and complex numbers concepts.*

Pokok Bahasan / *Contents*

1. Sistem Persamaan Linier dan Eliminasi Gauss / *Linear Equation Systems and Gaussian Elimination*
2. Determinan dan Invers Matriks, dan penyelesaian sistem persamaan linier / *Determinants and Matrix Inversion, and the Solution of Linear Equation Systems*
3. Nilai eigen dan vektor eigen / *Eigenvalues and Eigenvectors*
4. Vektor, operasi vektor / *Vectors and Vector Operations*
5. Divergensi, gradien, curl / *Divergence, Gradient, Curl*
6. Operasi bilangan kompleks / *Complex Number Operations*
7. Formula euler dan fungsi hiperbolik / *Euler's Formula and Hyperbolic Functions*

Prasyarat / *Pre-requisite*

Pustaka / *Reference*

1. Howard Anton, "Elementary Linear Algebra", 12th Ed., Wiley, 2019
2. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Ed., Wiley, 2011
3. Ron Larson, "Elementary Linear Algebra", 8th Ed., Cengage Learning, 2017
4. Stephen Andrilli, "Elementary Linear Algebra", 5th Ed., Elsevier, 2016
5. James R. Kirkwood, "Elementary Linear Algebra", CRC Press, 2018
6. David C. Lay, "Linear Algebra and its Applications", 6th Ed., Pearson, 2021