



**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**

<b>1</b>	<b>Nama Mata Kuliah / Course Name</b> : Sinyal dan Sistem / <i>Signals and Systems</i>
<b>2</b>	<b>Kode Mata Kuliah / Course Code</b> : EE234305
<b>3</b>	<b>Kredit / Credits</b> : 3 SKS
<b>4</b>	<b>Semester / Semester</b> : 3

#### **Deskripsi Mata Kuliah / Course Description**

Mata kuliah Sinyal dan Sistem membahas tentang representasi sinyal dan sistem, konsep sistem Linear Time-Invariant (LTI) waktu kontinu, deret Fourier sinyal waktu kontinu, transformasi Fourier waktu kontinu dan aplikasinya, transformasi Laplace dan aplikasinya, konsep sistem LTI waktu diskrit, deret Fourier sinyal waktu diskrit, transformasi Fourier waktu diskrit dan transformasi  $z$ . / *The Signals and Systems course covers topics related to the representation of signals and systems, the concept of Continuous-Time Linear Time-Invariant (LTI) systems, continuous-time Fourier series, continuous-time Fourier transform and its applications, Laplace transform and its applications, the concept of Discrete-Time Linear Time-Invariant (LTI) systems, discrete-time Fourier series, discrete-time Fourier transform, and the  $z$ -transform.*

#### **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 6 Mampu mengkaji dan memanfaatkan matematika, ilmu pengetahuan alam dan teknologi serta mengidentifikasi, memformulasikan dan menyelesaikan permasalahan di bidang teknik elektro / *Able to evaluate and utilize mathematics, natural sciences, and technology, as well as identify, formulate, and solve problems in the field of electrical engineering.*

#### **Capaian Pembelajaran Mata Kuliah / Course Learning Outcomes**

1. Mampu memahami konsep dan representasi sinyal dan sistem. / *Able to understand the concepts and representations of signals and systems.*
2. Mampu menguasai konsep sistem Linear Time-invariant (LTI) dalam ranah waktu kontinu dan diskrit. / *Able to master the concept of Linear Time-Invariant (LTI) systems in both continuous and discrete time domains.*
3. Mampu memformulasikan deret Fourier waktu kontinu dan diskrit. / *Able to formulate continuous and discrete-time Fourier series.*
4. Mampu melakukan analisis sinyal dan sistem menggunakan transformasi Fourier waktu kontinu dan diskrit, Laplace, dan Z / *Able to perform signal and system analysis using continuous and discrete-time Fourier transformations, Laplace, and Z-transforms.*

#### **Pokok Bahasan / Contents**

1. Konsep dan Representasi Sinyal dan Sistem / *Concept and Representation of Signals and Systems*
2. Sistem LTI Waktu Kontinu dan Diskrit / *Continuous-Time and Discrete-Time LTI Systems*
3. Deret Fourier Waktu Kontinu dan Diskrit / *Continuous-Time and Discrete-Time Fourier Series*
4. Transformasi Fourier Waktu Kontinu dan Diskrit / *Continuous and Discrete Time Fourier Transformations*
5. Transformasi Laplace / *Laplace Transform*
6. Transformasi Z / *Z-Transform*

#### **Prasyarat / Pre-requisite**

Persamaan Diferensial / *Differential Equations*

#### **Pustaka / Reference**

1. Fatoni, Ali. "Diktat Sistem Linear"
2. S.Soliman, Samir and D.Srinath,M. : "Continous and Discrete Signal and Systems", Prentice-Hall, Englewood Cliffs, New Jersey 1990.
3. V. Oppenheim, A and T. Young, Ian : "Signal and Systems", Prentice-Hall of India, New Delhi 1990
4. Sanjit K Mitra: "Digital Signal Processing : A Computer - Based Approach." 4th Edition. Mcgraw Hill Education, 2013