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

1	**Nama Mata Kuliah / Course Name**	:	Sinyal dan Sistem / Signals and Systems
2	**Kode Mata Kuliah / Course Code**	:	EL234302
3	**Kredit / Credits**	:	3 SKS
4	**Semester / Semester**	:	3

Deskripsi Mata Kuliah / Course Description

Mata kuliah Sinyal dan Sistem membahas tentang representasi sinyal dan sistem, konsep sistem Linear Time-Invariant (LTI) waktu kontinyu, deret Fourier sinyal waktu kontinyu, transformasi Fourier waktu kontinyu dan aplikasinya, transformasi Laplace dan aplikasinya, serta disain filter analog Butterworth and Chebyshev.

The Signals and Systems course discusses signal and system representation, the concept of continuous time Linear Time-Invariant (LTI) systems, continuous time signal Fourier series, continuous time Fourier transform and its applications, Laplace transform and its applications, and Butterworth and Chebyshev analog filter design.

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

1. (CPL-04) Mampu menerapkan ilmu pengetahuan alam dan matematika serta teknologi dan rekayasa informasi untuk memperoleh pemahaman komprehensif pada bidang Teknik Telekomunikasi.
   (PLO-04) *Able to apply knowledge of sciences, mathematics, and information technology to acquire comprehensive understanding of engineering principles in Telecommunication Engineering.*

2. (CPL-05) Mampu merancang komponen, sistem, dan proses yang logis dan realistis sesuai dengan spesifikasi yang ditentukan dengan mempertimbangkan aspek keselamatan, sosial, budaya, lingkungan, dan ekonomi.
   (PLO-05) *Able to design components, systems, and/or processes to meet desired needs within realistic constraints in such aspects as law, economic, environment, social, politics, health and safety, sustainability as well as to recognize and/or utilize the potential of local and national resources with global perspective.*

Capaian Pembelajaran Mata Kuliah / Course Learning Outcomes

1. Mampu merepresentasikan sinyal waktu kontinyu dalam persamaan sinyal-sinyal dasar. / Be able to represent continuous time signals in the equations of basic signals.
2. Mampu menjelaskan konsep sistem LTI waktu kontinyu. / *Be able to explain the concept of a continuous time LTI system.*
3. Mampu menjelaskan konsep dan melakukan analisis sinyal dan sistem LTI waktu kontinyu dalam domain frekuensi / *Be able to explain concepts and perform signal analysis and continuous time LTI systems in the frequency domain*
4. Mampu menerapkan transformasi-Laplace dalam analisis sinyal dan sistem LTI waktu kontinyu / *Be able to apply the Laplace-transform in signal analysis and continuous time LTI systems*.
5. Mampu mendisain filter analog Butterworth dan Chebyshev / *Able to design Butterworth and Chebyshev analog filters.*

Pokok Bahasan / Contents

1. Konsep sinyal waktu kontinyu / The concept of continuous time signals.
2. Konsep sistem LTI waktu kontinyu dan analisanya dalam ranah waktu / *The concept of a continuous-time LTI system and its analysis in the time domain.*
3. Analisa frekuensi sinyal dan sistem LTI waktu kontinyu / *Signal frequency analysis and continuous time LTI systems.*
4. Analisa sistem LTI waktu kontinyu dengan transformasi-Laplace / Continuous-time LTI system analysis with Laplace-transform
5. Disain Filter Analog Butterworth and Chebyshev / *Butterworth and Chebyshev Analog Filter Design.*

Prasyarat / Pre-requisite

Kalkulus 1, kalkulus 2/ Calculus 1, Calculus 2

Pustaka / Reference

Utama / Primary :

1. Khalid Sayood, Signals and Systems: A One Semester Modular Course (Synthesis Lectures on Signal Processing), Morgan & Claypool, 2021.
2. Hwei P Hsu, Schaum's Outline of Theory and Problems of Signals and Systems, McGraw Hill, 1995.
3. Lonnie C Ludeman, Fundamentals of Digital Signal Processing, Wiley,1986.

Pendukung / Support :

1. Won Young Yang, Signals and Systems with Matlab, 4th Edition, Springer-Verlag Berlin Heidelberg, 2009.