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***	:	Sistem Kontrol Elektronika / *Electronic Control System*
2	**Kode Mata Kuliah / *Course Code***	:	EE234754
3	**Kredit / *Credits***	:	2 SKS
4	**Semester / *Semester***	:	0

Deskripsi Mata Kuliah / *Course Description*

Sistem kontrol elektronika membahas tentang metoda desain sistem kontrol elektronika dan realisasinya baik secara analog maupun secara digital. Metoda desain sistem kontrol meliputi metoda klasik dan metoda modern. Sistem identifikasi untuk mendapatkan model plant yang akan dipakai dalam desain sistem kontrol, juga dibahas dalam kuliah ini. Realisasi sistem kontrol secara analog dilakukan dengan menggunakan rangkaian op-amp. Realisasi sistem kontrol secara digital dilakukan dengan mikrokontroler. /

The course covers electronic control systems, discussing methods for designing electronic control systems and their implementation, both in analog and digital forms. Design methods for control systems include classical and modern approaches. System identification techniques for obtaining plant models used in control system design are also covered in this course. The implementation of analog control systems is done using op-amp circuits, while digital control systems are implemented using microcontrollers.

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 5   Mampu mendesain komponen, sistem, dan proses yang logis dan realistis sesuai dengan spesifikasi yang ditentukan dengan mempertimbangkan aspek keselamatan, sosial, budaya, lingkungan, dan ekonomi / *Able to design components, systems, and processes that are logical and realistic in accordance with specified specifications, while considering safety, social, cultural, environmental, and economic aspects.*

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*.

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. Memahami Sistem Kontrol Analog dan Digital / *Understanding Analog and Digital Control Systems*
2. Menerapkan Kontrol On-Off / *Implementing On-Off Control*
3. Menerapkan Kontrol PID / *Implementing PID Control*
4. Menerapkan Kontrol Logika Fuzzy / *Implementing Fuzzy Logic Control*
5. Menerapkan Sistem Identifikasi dan Kontrol / *Implementing Identification and Control Systems*
6. Menerapkan Kontrol Robust / *Implementing Robust Control*

Pokok Bahasan / *Contents*

1. Sistem Kontrol Analog Berbasis Op-Amp / *Op-Amp-Based Analog Control System*
2. Sistem Kontrol Digital Berbasis Mikrokontroler / *Microcontroller-Based Digital Control System*
3. Kontrol On-Off / *On-Off Control*
4. Kontrol PID / *PID Control*
5. Kontrol Logika Fuzzy / *Fuzzy Logic Control*
6. Sistem Identifikasi / *Identification System*
7. Disain Kontrol / *Control Design*
8. Kontrol Robust / *Robust Control*

Prasyarat / *Pre-requisite*

Dasar Sistem Kontrol / Fundamentals of Control Systems

Pustaka / *Reference*

1. Cheng Siong Chin, Computer-Aided Control Systems Design, CRC Press, 2013.
2. Chi-Tsong Chen, Analog and Digital Control System Design, Saunders College Publishing, 2005
3. Jan Jantzen, Foundations of Fuzzy Control: a Practical Approach (2nd Edition), John Wiley & Sons, 2013.
4. Ioan D. Landau and Gianluca Zito, Digital Control Systems: Design, Identification and Implementation, Springer-Verlag, 2006