



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 : Instrumentasi Sistem Kontrol / <i>Control System Instrumentation</i>
2	Kode Mata Kuliah / Course Code : EE234503
3	Kredit / Credits : 3 SKS
4	Semester / Semester : 5

Deskripsi Mata Kuliah / Course Description

Mata kuliah ini membahas tentang konsep penerapan sistem instrumentasi terkait pengukuran, variabel proses, transduser, pemilihan sensor, karakteristik dalam pengaplikasian berbagai macam sensor (mekanik, optik, thermal, lainnya), rangkaian pengkondisi sinyal konverter. / *This course covers the concepts related to the application of instrumentation systems, including measurements, process variables, transducers, sensor selection, and characteristics of various types of sensors (mechanical, optical, thermal, etc.), as well as signal conditioning and conversion circuits.*

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

- 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. Mampu merancang sistem kontrol beserta instrumentasi yang diperlukan sehingga objektif kontrol terpenuhi / *Able to design a control system along with the necessary instrumentation to achieve control objectives.*
2. Mampu membuat diagram sistem kontrol dalam diagram fisik, blok dan instrumentasi (P&ID) / *Able to create control system diagrams in physical, block, and instrumentation diagrams (P&ID).*
3. Mampu mengidentifikasi dan merancang kebutuhan sensor dan aktuator pada suatu sistem kontrol proses / *Able to identify and design the requirements for sensors and actuators in a process control system.*
4. Mampu mensimulasikan sistem instrumentasi untuk kontrol proses / *Able to simulate instrumentation systems for process control.*

Pokok Bahasan / Contents

1. Pengenalan Sistem Instrumentasi / *Introduction to Instrumentation System*
2. Pengenalan Sistem Kontrol Proses / *Introduction to Process Control System*
3. Piping and Instrumentation Diagram (P&ID) / *Piping and Instrumentation Diagram (P&ID)*
4. Analog Signal Conditioning / *Analog Signal Conditioning*
5. Digital Signal Conditioning / *Digital Signal Conditioning*
6. Jenis-jenis sensor / *Types of Sensors*
7. Transmisi dan Komunikasi / *Transmission and Communication*
8. Kontrol Otomatis / *Automatic Control*
9. Jenis-jenis Aktuator / *Types of Actuators*
10. Element kontrol Akhir / *Final Control Element*

Prasyarat / Pre-requisite

Pustaka / Reference

1. Curtis D. Jonhson., "Process control instrumentation technology," 7th edition, PHI, New Jersey, 1989
2. Wolfgang Altmann, "Practical Process Control for Engineers and Technicians," John Elsevier, 2005
3. W.L. Luyben, "Process Modeling, Simulation and Control for Chemical Engineers," McGraw Hill, 2nd edition, 1990
4. Karl J. Astrom, and Bjorn Wittenmark, "Computer-controlled systems: theory and design," 3rd edition, PHI, New Jersey, 1997