

<b>MATA KULIAH</b>	<b>Nama Mata Kuliah</b> : Tek. Sensor & Transmitter
	<b>Kode MK</b> : VI231204
	<b>Kredit</b> : 3 SKS
	<b>Semester</b> : II

### **DESKRIPSI MATA KULIAH**

Matakuliah Teknologi Sensor dan Transduser ini termasuk dalam rumpun mata kuliah Instrumentasi di PS S. Tr. TRI – ITS. Matakuliah ini membahas tentang prinsip dan mekanisme pengukuran besaran fisis menggunakan sensor, jenis-jenis transduser, karakteristik statik dan dinamik, klasifikasi sensor, aktuator, akuisisi data dan pengondisian sinyal.

### **CAPAIAN PEMBELAJARAN LULUSAN YANG DIBEBANKAN MATA KULIAH**

- Mampu mengkaji kasus penerapan ilmu pengetahuan dan teknologi di bidang keahlian sesuai standar kompetensi kerja, serta mampu mengambil keputusan secara tepat dari hasil kerja sendiri maupun kerja kelompok dalam bentuk laporan tugas akhir atau bentuk kegiatan pembelajaran lain yang luarannya setara dengan tugas akhir melalui pemikiran logis, kritis, inovatif, bermutu dan terukur dengan mempertimbangkan kesehatan, keselamatan, keamanan, dan lingkungan. (CPL-2)
- Mampu berkomunikasi, menulis laporan serta membuat presentasi secara efektif. (CPL-4)
- Mampu merancang solusi untuk masalah teknologi dan rekayasa Instrumentasi serta dapat berkontribusi pada desain sistem, komponen maupun proses untuk memenuhi kebutuhan tertentu dengan mempertimbangkan standar keamanan, kesehatan dan keselamatan public. (CPL-7)
- Mampu memilih, menggunakan dan menerapkan teknik dan sumber daya yang tepat termasuk penggunaan piranti keras maupun lunak yang mutakhir untuk memberikan solusi atas permasalahan di bidang rekayasa Instrumentasi. (CPL-9)

<b>CAPAIAN PEMBELAJARAN MATA KULIAH</b>
<ul style="list-style-type: none"><li>▪ Mahasiswa mampu memahami elemen sensor dan transduser yang biasa diterapkan pada dunia industri.</li><li>▪ Mahasiswa mampu mengidentifikasi karakteristik statik dan dinamik dari elemen sensor.</li><li>▪ Mahasiswa mampu menjelaskan prinsip kerja sensor dan transduser secara komprehensif.</li><li>▪ Mahasiswa mampu mengklasifikasikan jenis-jenis sensor sesuai dengan penggunaannya.</li></ul>
<b>POKOK BAHASAN</b>
<ul style="list-style-type: none"><li>▪ Pengantar Teknologi Sensor</li><li>▪ Karakteristik Statik Sensor</li><li>▪ Standar Prosedur Pemilihan Sensor</li><li>▪ Sensor acceleration, velocity, shock, motion, vibration</li><li>▪ Sensor Force, Strain, Tactile, Load, Weight</li><li>▪ Sensor Displacement, Position</li><li>▪ Sensor Level</li><li>▪ Sensor Pressure</li><li>▪ Sensor Flow</li><li>▪ Sensor, Temperature, Humidity, Moisture</li><li>▪ Sensor Intensity of Light, Acoustic</li><li>▪ Sensor for Chemical</li></ul>
<b>PRASYARAT</b>
<ul style="list-style-type: none"><li>▪ Teknik Pengukuran</li><li>▪ Teknik Kalibrasi</li></ul>
<b>PUSTAKA</b>

**Buku:**

1. Pallas-Areny, R., Webster, John G., 1991, Sensors and Signal Conditioning, John Wiley & Sons, Inc., New York.
2. Fraden, J., 2004, Handbook Of Modern Sensors : Physics, Designs, and Applications, 3/ed, Springer Science + Business Media, LLC, New York

<b>COURSE</b>	<b>Course Name</b> : Sensor and Transmitter Technology
	<b>Course Code</b> : VI231204
	<b>Credit</b> : 3 sks
	<b>Semester</b> : II

### DESCRIPTION OF COURSE

This course is included in the Instrumentation course category at PS S. Tr. TRI - ITS. This course discusses the principles and mechanisms of measuring physical quantities using sensors, types of transducers, static and dynamic characteristics, sensor classification, actuators, data acquisition and signal conditioning.

### LEARNING OUTCOMES

- Able to review cases of the application of science and technology in the field of expertise according to work competency standards, and able to make appropriate decisions from the results of their own work and group work in the form of a final project report or other forms of learning activities whose output is equivalent to the final project through logical, critical, innovative, quality and measurable thinking by considering health, safety, security and the environment. (CPL-2)
- Able to communicate, write reports and make presentations effectively. (CPL-4)
- Able to design solutions to Instrumentation technology and engineering problems and can contribute to the design of systems, components and processes to meet specific needs by considering security, health and public safety standards. (CPL-7)
- Able to select, use and apply appropriate techniques and resources including the use of the latest hardware and software to provide solutions to problems in the field of Instrumentation engineering. (CPL-9)

### COURSE LEARNING OUTCOME

- Students are able to understand the sensor and transducer elements commonly used in the industrial world.
- Students are able to identify the static and dynamic characteristics of the sensor element.
- Students are able to explain the working principle of sensors and transducers comprehensively.
- Students are able to classify the types of sensors according to their use.

### **MAIN SUBJECT**

- Introduction to Sensor Technology
- Static Sensor Characterization
- Standard Sensor Selection Procedure
- Acceleration, velocity, shock, motion, vibration sensors
- Force, Strain, Tactile, Load, Weight Sensors
- Displacement Sensor, Position
- Level Sensor
- Pressure Sensor
- Flow Sensor
- Sensor, Temperature, Humidity, Moisture
- Light Intensity Sensor, Acoustic
- Sensors for Chemicals

### **PREREQUISITES**

- Measurement Techniques
- Calibration Techniques

### **REFERENCE**

Book:

1. Pallas-Areny, R., Webster, John G., 1991, Sensors and Signal Conditioning, John Wiley & Sons, Inc., New York.
2. Fraden, J., 2004, Handbook Of Modern Sensors : Physics, Designs, and Applications, 3/ed, Springer Science + Business Media, LLC, New York

*Silabus Mata Kuliah*  
*Program Studi Sarjana Terapan Teknologi Rekayasa Instrumentasi*