

<b>MATA KULIAH</b>	<b>Nama Mata Kuliah</b> : Teknik Kalibrasi
	<b>Kode MK</b> : VI231311
	<b>Kredit</b> : 3 SKS
	<b>Semester</b> : III

### **DESKRIPSI MATA KULIAH**

Matakuliah Teknik Kalibrasi ini termasuk dalam rumpun mata kuliah uji dan kalibrasi di PS S. Tr. TRI – ITS. Matakuliah ini membahas tentang prinsip teknik kalibrasi yang berkaitan dengan standar regulasi nasional/internasional kalibrasi, metode-metode kalibrasi, penyelesaian studi kasus kalibrasi dan report hasil kalibrasi (nilai koreksi dan ketidakpastian).

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

1. 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)
2. Mampu berkomunikasi, menulis laporan serta membuat presentasi secara efektif. (CPL-4)
3. Mampu menerapkan pengetahuan matematika, ilmu alam, dasar-dasar instrumentasi pengukuran, pengendalian dan pengamanan untuk prosedur, proses, sistem maupun metodologi teknik yang diterapkan dalam suatu proses industry. (CPL-5)
4. Mampu mengidentifikasi, merumuskan, meneliti literatur dan menganalisis masalah teknik di bidang teknologi Instrumentasi untuk mencapai kesimpulan yang dapat dibuktikan dengan menggunakan alat analisis sesuai standar disiplin ilmu teknik instrumentasi. (CPL-6)
5. Mampu melakukan investigasi terhadap permasalahan instrumentasi industri, mencari, memilih data yang relevan dari literatur, merancang

dan melakukan eksperimen untuk memberikan kesimpulan yang valid.  
(CPL-8)

#### **CAPAIAN PEMBELAJARAN MATA KULIAH**

- Mahasiswa mampu memahami konsep dasar dan hirarki kalibrasi
- Mahasiswa mampu memahami dan menerapkan ketelusuran pada proses kalibrasi
- Mahasiswa mampu memahami standar regulasi (SOP) teknik kalibrasi nasional dan internasional
- Mahasiswa mampu memahami metode kalibrasi pada berbagai alat ukur dan sensor.

#### **POKOK BAHASAN**

1. Pengantar Kalibrasi
2. Teori Kalibrasi
3. Metode Kalibrasi
4. Report Hasil Kalibrasi
5. Kalibrasi Sensor Flow, Level, Pressure, Temperature
6. Kalibrasi Sensor Analisis Komposisi, Berat, Kecepatan
7. Kalibrasi Flow Transmitter
8. Kalibrasi Level Transmitter
9. Kalibrasi Pressure Transmitter
10. Kalibrasi Temperature Transmitter
11. Kalibrasi Control Valve
12. Kalibrasi Safety Valve

#### **PRASYARAT**

- Fisika Terapan

#### **PUSTAKA**

Buku:

1. Alan S Morris, 2001, Measurement and Instrumentation Principles
2. I. Gertsbakh, 2002, Measurement Theory for Engineers

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| 3. Ali Musyafa', 2016, Teknik Kalibrasi Studi Kasus : Kalibrasi Kelistrikan dan Suhu. |
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<b>COURSE</b>	<b>Course Name</b> : Calibration Technique
	<b>Course Code</b> : VI231311
	<b>Credit</b> : 3 SKS
	<b>Semester</b> : III

#### **DESCRIPTION OF COURSE**

This Calibration Engineering course is included in the test and calibration course family at PS S. Tr. TRI - ITS. This course discusses the principles of calibration techniques related to national/international calibration regulatory standards, calibration methods, completion of calibration case studies and reports of calibration results (correction values and uncertainties).

#### **LEARNING OUTCOMES**

1. 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)
2. Able to communicate, write reports and make presentations effectively. (CPL-4)
3. Able to apply knowledge of mathematics, natural sciences, basics of measurement instrumentation, control and security for procedures, processes, systems and engineering methodologies applied in an industrial process. (CPL-5)

4. Able to identify, formulate, research literature and analyze engineering problems in the field of Instrumentation technology to reach conclusions that can be proven by using analytical tools according to the standards of the instrumentation engineering discipline. (CPL-6)

5. Able to investigate industrial instrumentation problems, search, select relevant data from the literature, design and conduct experiments to provide valid conclusions. (CPL-8)

### **COURSE LEARNING OUTCOME**

- Students can understand the basic concepts and calibration hierarchy.
- Students can understand and apply traceability in the calibration process.
- Students can understand the national and international calibration standards (SOP) of calibration techniques.
- Students can understand the calibration method on various measuring devices and sensors.

### **MAIN SUBJECT**

1. Introduction to Calibration
2. Calibration Theory
3. Calibration Method
4. Calibration Result Report
5. Flow, Level, Pressure, Temperature Sensor Calibration
6. Calibration of Composition, Weight, Velocity Analysis Sensor
7. Flow Transmitter Calibration
8. Level Transmitter Calibration
9. Pressure Transmitter Calibration
10. Temperature Transmitter Calibration
11. Control Valve Calibration
12. Safety Valve Calibration

### **PREREQUISITES**

- Applied Physics

**REFERENCE**

Book:

1. Alan S Morris, 2001, Measurement and Instrumentation Principles
2. I. Gertsbakh, 2002, Measurement Theory for Engineers
3. Ali Musyafa', 2016, Teknik Kalibrasi Studi Kasus : Kalibrasi Kelistrikan dan Suhu.