COURSE	**Course Name**	: Actuator Technology
	Course Code	: VI231419
	Credit	: 3 SKS
	Semester	: IV

DESCRIPTION OF COURSE
Actuator Technology is one of the mandatory compulsory courses in the Instrumentation Engineering Technology Study Program. This course focuses on the study of actuators, which are important components in instrumentation and control systems. Actuators are used to convert signals or energy into specific physical actions, such as movement or adjustment of position. This course covers various aspects of actuator technology, including working principles, types, design, selection, and operation of actuators.
LEARNING OUTCOMES
▪ Able to study 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 one's own work or group work in the form of final assignment reports or other forms of learning activities whose output is equivalent to the final assignment through logical thinking, critical, innovative, quality and measurable 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 investigate industrial instrumentation problems, search for, select relevant data from the literature, design and conduct experiments to provide valid conclusions. (CPL-8)

COURSE LEARNING OUTCOME

- Able to understand pneumatic actuators
- Able to understand hydraulic actuators
- Able to understand Pneumatic Valve and Damper Control
- Able to understand Analog & Digital Pneumatic Control
- Able to understand Instrument Air Systems
- Able to understand the Hydraulic Oil Supply System
- Able to understand Actuator Reliability, Availability, and Maintainability
- Able to calculate actuator reliability

MAIN SUBJECT

- Introduction to Actuator Technology
- Pneumatic actuator
- Pneumatic Valve and Damper Control
- Analog & Digital Pneumatic Control
- Instrument Air Systems
- Hydraulic Actuator
- Hydraulic Oil Supply System
- Motor Control, Variable Frequency Motor Drives
- D.C motors - AC motors - Single phase & 3 Phase Induction Motor; Synchronous Motors; Stepper motors - Piezoelectric Actuators
- Construction, Characteristics and Types, Selection criteria.
- Actuator Reliability, Availability, and Maintainability
- Actuator Reliability Calculation

PREREQUISITES

REFERENCE
Main: 1. "Instrumentation and Control Systems" by W. Bolton: This book provides a comprehensive understanding of the basic principles of instrumentation and control systems, including topics related to actuator technology. 2. "Actuators: Basics and Applications" by Harald Aschemann: This book discusses the basic principles, types and applications of actuator technology. Various actuators, such as electric motors, hydraulic actuators, and pneumatic actuators, are explained in detail. 3. "Control Systems Engineering" by Norman S. Nise: This book is an extensive resource on control systems and includes sections relevant to actuator technology. This book helps in understanding the principles of control and how actuators play a role in the system. Supplementary: 1. Journals and conference proceedings: Following journals and conference proceedings related to actuator technology can provide the latest information on developments and research in the field. Some relevant journals include "IEEE/ASME Transactions on Mechatronics", "Journal of Dynamic Systems, Measurement, and Control", and "Sensors and Actuators A: Physical". 2. Referrals from lecturers or course instructors: Lecturers or course instructors may have specific resources or recommended teaching materials for the course. Be sure to check the course guide or ask your professor questions about references you can use.