SENSORS & ACTUATORS LAB PORTFOLIO

Course ID: ME - 4321

Department: Mechatronics Department – College of Engineering

Lab Objectives:

- Understanding basic laws and phenomena on which operation of sensors and actuators-transformation of energy is based,
- Conducting experiments in laboratory and industrial environment.
- Explain fundamental physical and technical base of sensors and actuators.
- Describe basic laws and phenomena that define behavior of sensors and actuators.
- Analyze various premises, approaches, procedures and results related to sensors and actuators.
- Create analytical design and development solutions for sensors and actuators
- Conduct experiments and measurements in laboratory and on real components, sensors and actuators,
- Interpret the acquired data and measured results,
- Describe development and application of sensors and actuators
- Take part in team work and be able to independently present various professional materials.

TRANSDUCER & INSTRUMENTATION TRAINER IT - 5927

The SAIT Trainer is designed to show most of the devices used in the industry that allow the electronic systems to communicate with the real world, to measure physical variables and to control industrial processes. It is a trainer with a logical distribution of its components that facilitates the rapid comprehension of the elements that form it, all housed in a solid robust with the power supply incorporated. Input Transducers: These convert an analog signal into an electrical one and permit us to make an evaluation of these transducers, with their characteristics, adjustments and practical applications. Output Transducers: These convert an electrical signal into an analog one permit us to make an evaluation of these transducers, their characteristics, adjustments and practical applications. Signal Conditioning Circuits: These allow us to carry out a profound study and analysis of the numerous circuits and included signal conditioners, in addition to the particular properties of: amplifiers, signal converter circuits, comparators, filters and circuits that carry out mathematical operations. The student must wire the circuit to carry out the practices. The connections are of 2 mm. The student will become familiar with the connections of these transducers.

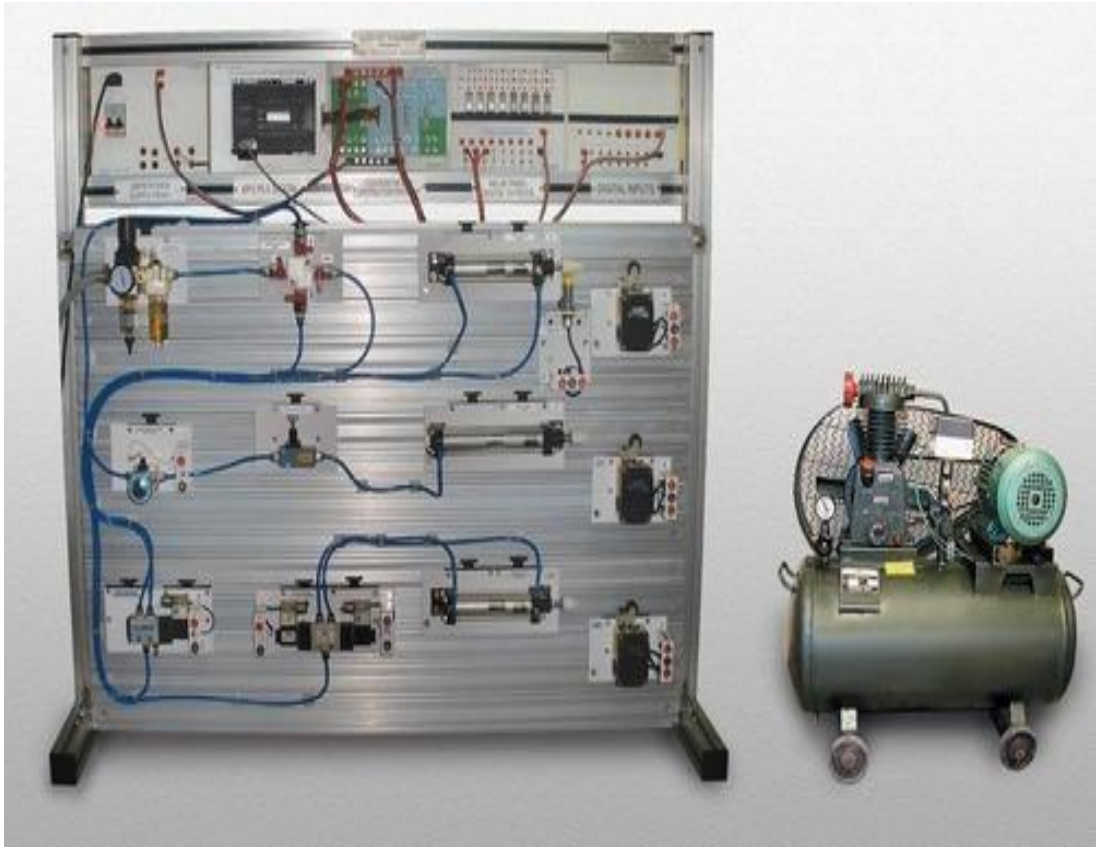
PROCESS INSTRUMENTATION TRAINER – IT 5200

A purpose built trainer consisting of a mobile work station and a modular range of industrial process sensors and transmitters for the study of their calibration and their applications.

Based on a mobile trolley that incorporates all electrical, water (including a water heater) and air controls, the system provides a totally self-contained unit. The punched front panel provides a construction area that allows devices to be fixed to it via a series of keyhole slots. The instrumentation devices are mounted on robust carriers that allow them to be located and locked onto the front panel.

BASIC PNEUMATIC VALVE CONTROL APPARATUS

Pneumatics is successfully used in many areas of industrial automation. Pneumatic Trainer facilitates the students and the industrial professionals to explore the fundamental of “pneumatics”. It tells how one device can be used to manage, command, direct or regulate the behavior of other system. Pneumatics is a branch of science that is related with Air. In pneumatics the working medium is “Compressed Air”. Now - a - days this working medium is becoming very popular in industries like chemical, petroleum, gases, food & beverage, robotics, machineries etc. The reason for being so popular is that it is fire free and nonhazardous to our environment. And it is abundantly available in nature. It is very easy, simple and safe to operate. Pneumatic Trainer assist user to understand the principle performance of the pneumatic components as well as different actuators. Another additional feature of Pneumatic Trainer, it has both manual and automatic based control.



BASIC ELECTRO PNEUMATIC TRAINER KIT

Pneumatic systems use a variety of components to affect movement, as well as for control purposes. For efficient movement and control, the following pneumatic equipment components are used:

- Pneumatic Actuators: Basic pneumatic actuators are used to trigger control valves to cause motion. Pneumatic actuators are most commonly used in assembly lines or for loading and unloading purposes.
- Pneumatic Cylinders: Cylinders are a mechanical device in a pneumatic system that produces force via compressed air. Once pneumatic cylinders are actuated, compressed air enters into the tube at one end of the piston and imparts force on the piston, which causes the piston to move.
- Pneumatic Pumps: As an air exhausting mechanism, this pneumatic equipment component sucks in outside air, compresses it and harnesses the air for use in your process.
- Pneumatic Valves: Controlling air flow and preventing leakage in your pneumatic device is paramount in ensuring that your process runs efficiently. This pneumatic equipment component achieves both of these goals.