The Department of Electronics and Instrumentation Engineering had signed an MOU with National Instruments. This MOU is to train our students on in the field of Virtual Instrumentation Platform. As a result of active association with National Instruments, Every year Interested and enthusiastic students are being certified as LabVIEW Associate Developers.

**RESEARCH FACILITIES**

- **EMBEDDED ROBOTICS PLATFORM(sbRIO-9631)**

  **Description**
  - The NI LabVIEW Robotics Starter Kit is an out-of-the-box mobile robot platform that features sensors, motors, and NI Single-Board RIO hardware for embedded control. The LabVIEW Robotics software included with the platform includes features for beginners and for those who are more experienced. If you are new to LabVIEW, you can use the high-level LabVIEW Robotics Starter Kit API to quickly get started and control the robot in real time.

**FIGURE**
Applications

- Design of smart floor cleaner
- Object tracking robot
- Long range spy robot with night vision
- Robotic vehicle controlled by hand gesture

▲ ZYNQ BASED EMBEDDED VISION HARDWARE FOR DIGITAL IMAGE PROCESSING APPLICATION BUNDLE

Description:

- Embedded Vision is one of the most exciting fields in technology today. Xilinx sees embedded vision as a key and pervasive megatrend that is shaping the future of the electronics industry.

FIGURE

Applications:

- Diagnosis of Diabetes using iris image
- Object tracking
- Object detection and recognition
- Design of classifier for various medical applications
VISION AND MOTION MODULE(SOFTWARE)

Description:
- The Vision Development Module helps you develop software for machine vision and image processing applications. You can use it with the LabVIEW and LabVIEW NXG graphical programming environment, C, C++, and C# for Windows systems and LabVIEW for real-time systems. Choose from hundreds of image processing algorithms including filters, morphologies, pattern matching, and classification. The module includes IP for targeting both processors and FPGAs and features model importers for performing inference using deep learning models developed in Tensor Flow.

Applications:
- Cancer detection
- PD tremor frequency detection
- Diagnosis of Diabetes using iris image

FPGA EMBEDDED SYSTEM DESIGN (NI CRIO-9073)

Description:
- CompactRIO Controllers are embedded controllers with a real-time processor and a user-programmable FPGA. They range from full rugged systems to single-board RIO products that serve as single board computers (SBCs) and system on modules (SOMs).
- Automating a mechanical endurance/life test for circuit breakers and associated products by developing a test bench that has multiple independent test stations, can be expanded without disturbing the tests in progress, and provides fault signaling and control to the user using a GSM-based SMS service.

FIGURE:
Applications:

- CompactRIO systems provide high-performance processing capabilities, sensor-specific conditioned I/O, and a closely integrated software toolchain that make them ideal for Industrial Internet of Things (IIoT), monitoring, and control applications.

Description:

- Wireless measurement and monitoring systems provide an opportunity to reduce installation and system costs, increase flexibility, simplify system deployments, and address a new set of applications that were previously challenging or impossible with a wired approach. Implementing an NI wireless measurement solution allows you to enjoy these benefits without compromising system reliability or measurement quality. The NI platform also delivers the ability to integrate wireless devices with wired systems to create a complete measurement and control system.
Applications:

- For most WSN applications, you can create a basic network architecture in which the distributed measurement nodes acquire data from the environment around them and transmit these measurements to a gateway. NI WSNs provide the flexibility to connect your Ethernet gateway to a Windows or LabVIEW Real-Time host controller.

✓ NI-MY DAQ

Description:

- NI myDAQ is a low-cost portable data acquisition (DAQ) device that uses NI LabVIEW-based software instruments, allowing students to measure and analyze real-world signals. NI myDAQ is ideal for exploring electronics and taking sensor measurements.
Applications:

- Intro to engineering
- Student Design
- Biomedical engineering

PCI GPIB STARTER KIT

Description:

- The National Instruments PCI-GPIB/LabVIEW for Windows Academic Starter Kit is the perfect introductory product for instrument control using a Windows PC. The NI PCI-GPIB is a high-performance Plug and Play IEEE 488 interface for PCs equipped with PCI expansion slots.
Applications:

- Easy-to-use, powerful LabVIEW graphical development environment
- TNT and MITE ASICs provide maximum IEEE 488.2 performance
- Onboard bus master DMA Controller ensures no microprocessor interruption for data transfers

NI myRIO Mechatronics Accessory Kit

Description:

- The myRIO Controls Mechatronics and Robotics Device enables educators to teach control theory at an undergraduate level with the real-time control capabilities of the myRIO Student Embedded Device. Students can explore topics from introductory controls to building complex systems with the provided embedded target, I/O, and connectivity. This device connects directly to the myRIO device.
Applications:

- Mechatronics sensors and actuators
  - Classical controls
  - Robotics
  - Vision
  - Student capstone

NI myRIO Embedded Systems Accessory Kit

Description:

- The myRIO Student Embedded Device features I/O on both sides of the device in the form of MXP and MSP connectors. It includes analog inputs, analog outputs, digital I/O lines, LEDs, a push button, an onboard accelerometer, a Xilinx FPGA, and a dual-core ARM Cortex-A9 processor. Some models also include WiFi support. You can program the myRIO Student Embedded Device with LabVIEW or C. With its onboard devices, seamless software experience, and library of courseware and tutorials, the myRIO Student Embedded Device provides an affordable tool for students and educators.
Applications:

- Mechatronics sensors and actuators
- Classical controls
- Robotics
- Vision
- Student capstone

NI roboRIO KIT

Description:

- Introducing the NI roboRIO Advanced Robotics Controller. This rock-solid device was designed specifically with FIRST in mind. It's more powerful, lighter, and smaller than the previous cRIO, giving FRC teams unmatched power and versatility.
Applications:

- This device is designed specifically with FIRST in mind. It's more powerful, lighter, and smaller than the previous generation. This controller will give FRC teams never before seen computing power. It is a Central control unit.

Description:

The NI Educational Laboratory Virtual Instrumentation Suite (NI ELVIS) II is a modular engineering educational laboratory device developed specifically for academia. With its hands-on approach, educators can help students learn practical, experimental skills.
Applications:

The NI ELVIS is a platform for unlimited circuits and electronics education and discovery. With the default breadboard and online course material, the NI ELVIS is the perfect way to increase student engagement in circuits classes with hands-on learning.

- **NI ELVIS II+**

  **Description:**

  Legacy NI ELVIS with higher oscilloscope performance.
Applications:

- The NI Educational Laboratory Virtual Instrumentation Suite (NI ELVIS) II+ is a modular engineering educational laboratory device developed specifically for academia.

HVAC

Description:

- Heating, ventilation, and air conditioning (HVAC) is the technology of indoor and vehicular environmental comfort. Its goal is to provide thermal comfort and acceptable indoor air quality.
Applications:

- Saving Energy & Cost.
- Saving Time With an Automated HVAC Test System.

DC MOTOR CONTROL TRAINER

DESCRIPTION:

- The DC Motor Control Trainer (DCMCT) QNET module is designed to operate on the NIELVIS platform. The ELVIS unit is connected to an NI E-Series or M-Series data acquisition card inside the PC. The Labview program interacts with the data acquisition card to read three inputs – encoder, tachometer, and current sensor – and control the output voltage to the motor.
Applications:

- Illustrate motion control
- Using the QNET DC Motor Control Trainer, including modeling and validation, PID position and speed control, and disturbance rejection.

 ROTARY INVERTED PENDULUM

DESCRIPTION:

- Rotary inverted pendulum (Furuta pendulum) module for the rotary servo base unit. The classic lab experiment for control systems teaching and research.
APPLICATIONS:

- Rotary Inverted Pendulum can be used for research in various areas, including fuzzy control.

SOFTWARE:

- LabVIEW 2015
- NI MULTISIM
- VISION AND MOTION MODULE
  - Vision Builder for Automated inspection
  - Vision Development Module
  - Vision Acquisition software
  - Soft Motion Module for Motion controller and Motion Assistance