Nirma University
School of Technology, Institute of Technology
B. Tech (Electronics and Instrumentation Engineering)
Semester VI

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Course Code	2EI603
Course Title	**Instrumentation Laboratory**

Course Outcomes (CO) :

At the end of the course, students will be able to –
- apply the knowledge of different programming techniques for virtual instrumentation
- design algorithm for measurement and control
- simulate industrial processes in computer environment.

Syllabus	Teaching Hours

UNIT 1: Introduction to Virtual Instrumentation Tool

Software environment, creating and saving a VI, front panel toolbar, block diagram toolbar, data types, data flow program.

01

UNIT 2: Basic Programming

01

Numeric Operations Boolean Operations

UNIT 3: Structures

Introduction, for loops, while loops, terminals inside or outside loops, shift registers, feedback nodes, control timing, communicating among multiple loops, local variables Introduction, case structures, sequence structures, customizing structures, timed structures, formula nodes, event structures, math script.

05

UNIT 4: Arrays and Clusters

Introduction, creating one-dimensional array controls, creating two dimensional arrays, creating multidimensional arrays, arrays functions, creating cluster controls and indicators, clusters operations, assembling clusters, disassembling clusters, conversion between arrays and clusters.

04

UNIT 5: Strings

Introduction, creating string controls and indicators, string functions, editing, formatting and parsing string, formatting strings, configuring string controls and indicators

03

UNIT 6: Files handling and Report generation

Basics of files Input/output(I/O), choosing file I/O format, data directory, file I/O VIs, Creating a relative path, report generation in word and excel, archival of measuring data.

05

UNIT 7: Data Acquisition

Introduction, instrument I/O assistant, VISA programming terminology. Introduction, transducers, signals, data acquisition (DAQ) hardware configuration, DAQ hardware, analog input, analog output, digital I/O, DAQ software architecture, DAQ assistant, channels and task configuration, selecting and configuring a data acquisition device.

07

UNIT 8: Process Simulation

Simulation of Close loop processes like On-off Control Split range control, Monitor process parameter in graph, Alarm and Event Log.

04

Self Study:

The self study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self study contents.

Laboratory Work:

Laboratory work will consist of minimum 10 experiments based on the above syllabus.

References:
1. Jovitha Jerome, Virtual Instrumentation Using LabVIEW, PHI Publication.
2. Lisa K. Wells & Jeffrey Travis, LabVIEW for everyone, PHI Publication.
3. Sanjay Gupta and Joseph John, Virtual Instrumentation Using LabVIEW, Tata McGraw-Hill Publication.
4. Gary Johnson, LabVIEW Graphical Programming, McGraw Hill Publication.