

## UEI803 VIRTUAL INSTRUMENTATION

L	T	P	Cr
2	0	3	3.5

**Review of Virtual Instrumentation:** Historical perspective, Advantages etc., Block diagram and architecture of a virtual Instrument

**Data-flow Techniques:** Graphical programming in data flow, Comparison with conventional programming.

**VI Programming Techniques:** Vis and sub-Vis, Loops and charts, Arrays, Clusters and graphs, Case and sequence structures, Formula nodes, Local and global variables, String and file I/O.

**Data Acquisition Basics:** ADC, DAC, DIO, Counters and timers, PC Hardware' structure, Timing, Interrupts, DMA Software and hardware installation.

**Common Instrumentation Interfaces:** Current loop RS232C/ RS485, GPIB.

**Use of Analysis Tools:** Some tools from the advanced analysis tools relevant to the discipline may be included e.g, Fourier transforms, Power spectrum, Correlation methods, Windowing and filtering.

**Applications of VI:** VI Applications in various fields.

**Additional Topics:** System buses, Interface buses: USB, PCMCIA, VXI, SCXI, PXI, etc., Networking basics for office and industrial applications, VISA and IVI, Image acquisition and processing, Motion Control.

### **Laboratory Work:**

Components of LabVIEW, Celsius to Fahrenheit conversion, Debugging, Sub-VI, Multiplot charts, Case structures, ASCII files, Function Generator, Property Node, Formula node, Shift registers, Array, Strings, Clusters, DC voltage measurement using DAQ

**COURSE LEARNING OUTCOME (CLO):**The student will be able to

1. Demonstrate the working of labview.
2. Explain the various types of structures used in labview.
3. Analyze and design different type of programs based on data
4. Demonstrate the use of labview for signal processing image

### **Text Books:**

1. Johnson, G., *LabVIEW Graphical Programming*, McGraw–Hill (2006).
2. Sokoloff, L., *Basic Concepts of LabVIEW 4*, Prentice Hall Inc. (2004).
3. Wells, L.K. and Travis, J., *LabVIEW for Everyone*, Prentice Hall Inc. (1996).

### **Reference Book:**

1. Gupta, S. and Gupta, J.P., *PC Interfacing for Data Acquisition and Process Control*, Instrument Society of America (1988).

**Evaluation Scheme:**

<b>Sr. No.</b>	<b>Evaluation Elements</b>	<b>Weightage (%)</b>
1	MST	25
2	EST	35
3	Sessionals (May include Assignments/Projects/Tutorials/Quizzes/Lab Evaluations)	40

