Course Nu	mber a	and Na	me												
BEI704 &	Virtual	Instrun	nentatio	n											
Credits an	d Cont	tact Ho	urs												
3 & 45															
Course Co	ordina	tor's N	ame												
Ms.Venkat	eswari														
Text Book	s and I	Referen	ces												
Text Book	s:														
 LabVIII McGra Lisa K 	w-Hill	Profess	sional P	ublishi	ng				ard Je	nnings	3rd ed	ition ,			
References 1. Barry Pa 2. Buchana 3. https://v	ton, — n, W	—Comp						e Hall o	f India	2000.					
Course De															
			ned by -	- Dept.	of Elec	tronics	& Inst	rumenta	tion E	ngineer	ing				
Course Designed by – Dept. of Electronics Prerequisites								Co-requisites							
Microprocessor & Microcontroller							Nil								
	•	requi	red, ele	ctive, c	or select	ted elec	ctive (as	s per Ta	ble 5-1)					
		•				quired	•	•							
Course Ou	itcome	s (COs))												
CO1: Defin	ne virtu	al instr	ımentat	ion cor	ncepts.										
CO2: Desc	ribe acc	quisitio	n metho	odologi	es.										
CO3: Com	pare tra	ditiona	l and vi	rtual in	strume	ntation.									
CO4: Disci								ntation.							
CO5: Illust	rate im	plemen	tation n	nethods	for ins	trumen	tation.								
CO6: Fami		•													
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COs/POs	a	b	С	d	e	f	g	h	i	j	k	1			
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CO2	M	L	Н				M	L							

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CO3

CO4

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CO5	L					
CO6			Н			

List of Topics Covered

UNIT- I INTRODUCTION

9

Virtual Instrumentation - Definition and Flexibility - Block diagram and Architecture for Virtual Instruments versus Traditional Instruments Instrumentation -VI Programming techniques - VI, sub VI, Loop and Charts, Arrays, Clusters and Graphs, Case and Sequence Structures, Formula nodes, String and File Input / Output

UNIT- II DATA ACQUISTITION IN VI

9

A/D and D/A converters, Plug-in Analog Input / Output cards – Digital Input and Output Cards, Organization of the DAQ VI system – Opto-isolation – Performing analog input and analog output – Scanning multiple analog channels – Issues involved in selection of Data acquisition cards – Data acquisition modules with serial communication – Design of digital voltmeter with transducer input –Timers and Counters.

UNIT -III COMMUNICATION NETWORKED MODULES

9

Introduction to PC Buses – Local busses:- ISA, PCI, RS232, RS422 and RS485 – Interface Buses:- USB, PCMCIA, VXI, SCXI and PXI –Instrumentation Buses:- Modbus and GPIB – Networked busses – ISO/OSI Reference model, Ethernet and TCP/ IP Protocols.

UNIT- IV REAL TIME CONTROL IN VI

9

Designs using VI Software - ON/OFF controller - Proportional controller - Modeling and basic control of level and reactor processes - Case studies on development of HMI, SCADA in VI

UNIT- V OPERATING SYSTEM AND HARDWARE OVERVIEW

9

PC architecture, current trends, operating system requirements, PC based instrumentation, analog and digital interfaces, PXI and SCXI main frame - modular instruments - Transducers - power, speed and timing considerations.