Engineering Program

Specialization	Technology of remote industrial sensing and controlling
Course Number	20413246
Course Title	Industrial Measurement Lab
Credit Hours	3
Theoretical Hours	0
Practical Hours	1

Brief Course Description:

Experimental study of industrial measurement parameters . Working with real examples and applications.

Course Objectives:
Upon the completion of this course, the student will be able to:
1. Utilize sensors in measurement
2. Design and implement measurement system
3. Recognize different types of DAQs and data loggers
4. Use PC in in circuit design and testing

Detailed Course Description:

Chapter No.	Content title	Unit content	Time Needed
1	Experiment 1: Introduction to Multisim/ELVIS	- Tools, Menus, workspace - Opening and running samples - Creating a project /file - Saving, closing edition - Sources, components, data plotting and presentation Debugging and testing	
2	Experiment 2: Electrical measurement using ELVIS	- Current measurement - Voltage measurement - Resistance measurement - Power measurement - Frequency measurement	
3	Experiment 3: Pressure measurement	- Pressure measurement using Bourdon Tube - Pressure measurement using diaphragms	
4	Experiment 4: Temperature measurement	- Glass Thermometer - Bimetallic sensor - LM35 temperature sensor	
4	Experiment 5 Flow measurement	- Bubble flow meter - Flow velocity measurement - variable area meter	
5	Level measurement	- direct level measurement - indirect level measurement	
6	Microcontroller and PC based measurement system	Introduction to microcontroller and PC measurement system	
7	Connecting sensors to microcontroller	- potentiometer - LDR - Motion sensor	
8	Data Acquisition system	- ADC and DAC - Microcontroller based DAQ - DrDAQ - NI DAQs	

Evaluation Strategies:

		Percentage	Date
1. Exams	**Mid Exam**	20%	**/ /20__**
	Lab activates and reports	30%	**/ /20__**
	Final Exam	50%	**/ /20__**
Total		100%	

Teaching Methodology:
- Working with datasheet
- Practical experimental work in small groups

- PowerPoint slides
- Term projects

Text Books & References:

Textbooks
1. Labartory sheet prepared by instructor

References
Circuit Analysis with Multisim , David Báez-López and Félix E. Guerrero-Castro 2011

MultisimTM 8 Simulation and Capture, Component Reference Guide,