Fall 2023

OPSE 310 - 101: Virtual Instrumentation

Brandan Balasingham

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OPSE 310: Virtual Instrumentation

General information: 3 credit hours. T: 6:00PM-8:50PM, FMH 403B

Instructor: Brandan Balasingham, (732)-829-9158, brandan.balasingham@njit.edu

Office Hours: F: 6:00 – 9:00PM or by appointment.

Optional Text: LabVIEW Graphical Programming Fifth Edition ISBN: 1260135268

Course Content:

This course gives a comprehensive overview of National Instruments' graphical programming environment LabVIEW. Covers the basics of virtual instrumentation including use of IEEE GPIB, RS232 interfaces, and data acquisition boards. Interfacing of a computer to various instruments for data acquisition and instrument control. Emphasis is on the practical aspects of interfacing a computer to various instruments including timing issues, real-time data acquisition and instrument control, instrument status, and acquisition speed.

Prerequisite: Prior programming course or experience.

Specific goals for the course

- The student should be able to pass the NI Certified LabView Associate Developer (CLAD) certification exam
- The student should have a solid grasp on how to acquire and interpret data.
- The student should be able to master creating small to medium sized VIs
- The student will have a good understanding of the LabVIEW state-machine programming structure
- The student should be able to understand and use Loops/Arrays.
- The student should be able to understand the different I/O methods.

Lecture Quiz

There will be lecture quizzes about semi-weekly. Multiple choice lecture quiz to be given at the beginning of class and you will have around 15 minutes to complete each one.

Exams

You will have one midterm and one final exam. There will be open-ended style questions as well as multiple choice.

List of topics to be covered

Week(s)	Topic(s)
0	LabVIEW Introduction (Controls/Indicators)
1	Programming Structures and Examples
2	Global/local variables, charts, graphs
3,4	File IO / GPIB, Timing
4,5	RS232
6,7	DAQ I/O
8,9	Labview Advanced Topics
10,11	FFT, Filters
11,12	CLAD Review
13	Class Time for final project
14	Final Project Presentation

Grading Criteria:	Final:	20%
	Midterm:	10%
	Lecture Quizzes:	10%
	Labs:	40%
	Final Project:	20%

Letter Grades: (Curve will be applied at end of semester)

A 100% - 89%, B+ 89.9% - 84%, B 83.9% - 80%, C+ 79.9% - 75%, C 74.9% - 70.0%, D 69.9% - 60%, F <60%,

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