

**Fall 2025**  
**OPSE 310: Virtual Instrumentation**

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

**Instructor:** Brandan Balasingham, (732)-829-9158,  
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**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

<b>Grading Criteria:</b>	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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