SUNY Geneseo
Department of Physics and Astronomy
Class: TR 2:00 -3:15 pm; ISC 226
Web: www.geneseo.edu/~pogo

Dr. Pogo
Online Office Hours: MTW 8:30; MW 9:30; T 12:30; M 1:30
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Instrumentation & Interfacing: "LabVIEW"

(Phys 463)

Fall 2025

What am I doing here? LabVIEW is a graphical programming environment and language used to create data acquisition and control interfaces. In other words, it is used to enable a computer to control other real-world hardware. As a result of completing this course, you will be able to create control and acquisition programs using LabVIEW, and you will be able to interface the LabVIEW computer to external hardware using at least three protocols. We are using LabVIEW 2025.

Where can I get a textbook? The LabVIEW software comes with strong internal documentation, which we will consult in place of a textbook. If you want a book of your own, you might try this one:

LabVIEW for Scientists and Engineers, by John Essick

You can get a one year student license of LabVIEW for free from CIT to install on your Windows laptop. Mac users will have to use a windows emulator, such as "Bootcamp".

How will I be graded? That depends on the track *you* choose. At the beginning of the semester, you are in the "Homework" Track. You may request to change to the "Project" Track by sending me an email on or prior to October 16, 2025. Staying with the Homework Track ensures that you are exposed to as many hardware types as possible. Choosing the Project Track means that you will have a chance to express some creativity, and to learn about the struggles associated with project conception and its expression, redesign, and implementation. To pass this class, you must earn at least a "D" grade for project stages 6 and 7, or a "D" grade on each of assignments 8 and 10. It is my opinion that the coding for each of Assignments 8 and 10 is harder than the coding for any final project ever submitted. All late assignments lose up to 1.5 points per day.

Graded Activity	Homework Track	Project Track
Weekly Assignments 1 through 7	-	50%
Weekly Assignments 1 through 10	80%	-
Quizzes 1 through 5	20%	15%
Project Stages 1 through 5	0%	15%
Project Stages 6 and 7	0%	20%

In addition, you must complete 3 "reflections" about your work during the semester. Each reflection will be given a grade between 0 and 1. They are due with assignments 4, 7, and 10, as shown on the next page. To complete them, visit https://forms.gle/8E4v3ZEWNuE7wCpcA. If you don't earn a "1" grade on any reflection, you will be allowed to resubmit it until the next reflection is due. Your final grade will be computed by multiplying the percent shown above with all three reflection grades.

How will I submit assignments? Use this link on the course homepage: https://forms.gle/9rZSVxRFdAeVzRtJ6, then drag files as needed. Assignments **must** be titled **##-emailbase.vi**. So, my third assignment would be called "03-Pogo.vi". Sometimes, you will have to multiple vi's or other supporting files, too.

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Schedule of Deadlines

Date	Homework Track	Project Track	Notes
Tuesday, September 2, 2025	**Assignment #1**	**Assignment #1**	
Thursday, September 4, 2025	**Quiz #1**	**Quiz #1**	in class
Tuesday, September 9, 2025	**Assignment #2**	**Assignment #2**	
Tuesday, September 16, 2025	**Assignment #3**	**Assignment #3**	
Thursday, September 18, 2025	**Quiz #2**	**Quiz #2**	in class
Tuesday, September 30, 2025	**Assignment #4**	**Assignment #4**	Requires hardware!
Thursday, October 1, 2025	**Quiz #3**	**Quiz #3**	in class w/ hardware
Thursday, October 9, 2025	**Assignment #5**	**Assignment #5**	Requires hardware!
Thursday, October 16, 2025	**Deadline to request change to Project Track**		
Thursday, October 16, 2025	**Quiz #4**	**Quiz #4**	in class w/ hardware
Tuesday, October 21, 2025	**Assignment #6**	**Assignment #6**	Requires hardware!
Thursday, October 23, 2025		**Stage 1**	Abstract
Tuesday, October 28, 2025	**Assignment #7a**	**Assignment #7a**	Requires hardware!
Thursday, October 30, 2025	**Quiz #5**	**Quiz #5**	in class w/ hardware
Thursday, October 30, 2025		**Stage 2**	Full proposal
Thursday, November 6, 2025		**Stage 3**	Hardware Checklist
Thursday, November 13, 2025	**Assignment #8**		Requires hardware!
Thursday, November 13, 2025		**Stage 4**	Basic hardware demo
Tuesday, November 25, 2025	**Assignment #9**		
Tuesday, November 25, 2025		**Stage 5**	Software Milepost
Monday, December 8, 2025		**Stage 6**	Working Prototype
Wednesday, December 10, 2025	**Assignment #10**		Requires hardware!
Wednesday, December 10, 2025		**Stage 7**	Public Demonstration

What are these "stages" for the project? Projects will be completed and submitted in stages.

Stage 1: An abstract for your project. It is *your* responsibility to find an idea, not mine! You must use the submission form on the course home page.

Stage 2: A complete written proposal. The project proposal must be a short professional report describing the scope of your project. It must include (a) a new abstract, incorporating any revisions; (b) a detailed hardware list including DAQs, resistors, tape, screws, wood blocks, wires, etc.; (c) sketches of all the custom hardware you will build (or 3D print); (d) an example screenshot showing the GUI; (e) a discussion of other user interfacing (i.e., does the user need to adjust a voltage?); (f) a description of the measurement(s) to be made, including frequency, magnitudes, and units; (g) a description of what data will be permanently saved during each trial; (h) a description of what you want to be graded in stage 5 (allowing you to create a significant deadline for yourself), (i) a detailed flowchart diagramming the flow of information in the system, explicitly showing the necessary feedback with arrows between your blocks.

Stage 3: A detailed checklist (see also stage 2b) verifying that all the equipment has been obtained.

Stage 4: An in-class demonstration that each individual element of external hardware can, at a minimum, send or receive data from the computer, as appropriate.

Stage 5: A demonstration of your software so far, as defined by *you* in stage 2h.

Stage 6: A **complete** working prototype. Everything must work, but there may still be small glitches.

Stage 7: A public demonstration of your working project ("The LabVIEW Fair").

Learning Outcomes

As with most courses, this course has hundreds of learning outcomes. Here are some of them:

At the end of this course, students will:

- Be able to design, create, and debug instrument control and acquisition programs using LabVIEW
- Be able to use LabVIEW to interface your computer to instruments using at least three protocols (analog DAQ, digital DAQ, and RS-232 serial). In addition, you may learn other protocols (e.g., GPIB, USB).
- Design, create, and debug complex systems of instruments combining data input and output to work with your computer.
- Have an opportunity to install and activate software drivers for hardware components.
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- Create solutions to real-world engineering problems **integrating** circuits, programming, and human interface design.
- Have an opportunity to **apply** the methods of circuits, programming, and human interface design to develop real solutions to problems that are assigned to you and/or problems that you choose to examine.
- Have opportunities to reflect on how your assignments are changing the way you approach and the way you understand problems that combine circuits, programming, and human interface design.

Also, the college provides information at the following URL relating to a variety of topics:

https://bulletin.geneseo.edu/content.php?catoid=22&navoid=958

https://sunygeneseo.sharepoint.com/sites/provost/sitepages/syllabus%20resources%20related%20to%20student%20success/syllabus-resources-related-to-student-success.aspx?web=1