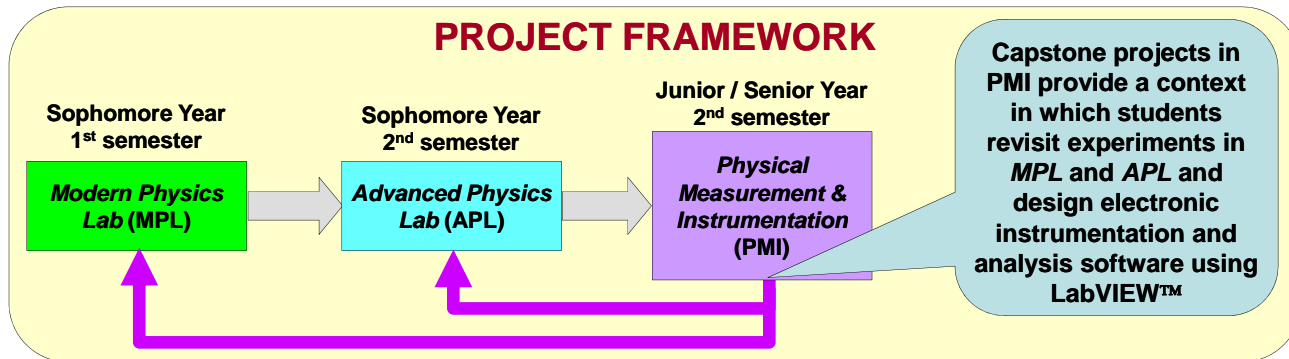


PROJECT GOALS

- Provide an opportunity to relearn concepts underlying common modern physics experiments they had completed one or two years prior to taking this class..
- Create a context in which students apply newly acquired knowledge and skills in...
 - design, simulation, building and testing of electronic circuits that are commonly used in electronic instrumentation.
 - programming using LabVIEW™ to control instruments, collect, analyze and display data and control instrumentation.
- Enable students to see how their learning experiences across various classes connect to and reinforce each other.

PROJECT FRAMEWORK



EXAMPLES OF CAPSTONE PROJECTS

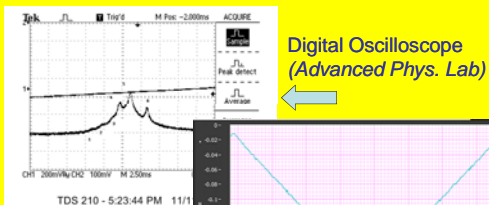
Saturated Absorption

Physics Goals: Understanding...

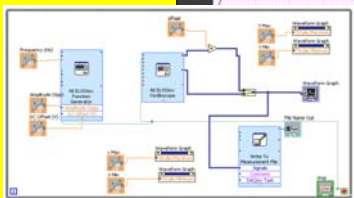
- saturation spectroscopy in Rubidium.
- mechanism underlying reduction in absorption.
- principles underlying a Michelson interferometer.

Instrumentation Goals: Using LabVIEW™ to

- control the diode laser.
- collect interferometer and absorption photodetector voltages.
- import data acquired by computer into an Excel-compatible spreadsheet for analysis.



LabVIEW™ output (PMI Capstone)



Frank Hertz

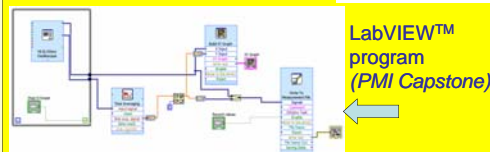
Physics Goals: Understanding...

- the reasons for quantization of energy levels of gas atoms.
- how to detect and compute these levels from a measurement of tube current.

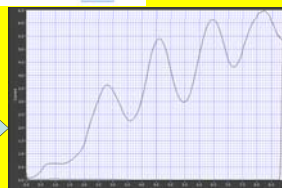
Instrumentation Goals: Learning how...

- analog-to-digital conversion can be used in order for a computer to read and control analog voltages to control an experiment.
- to write a LabVIEW™ program to read in the amplified tube current.

NI ELVIS - IITM interfaced with computer controls experiment (PMI Capstone)

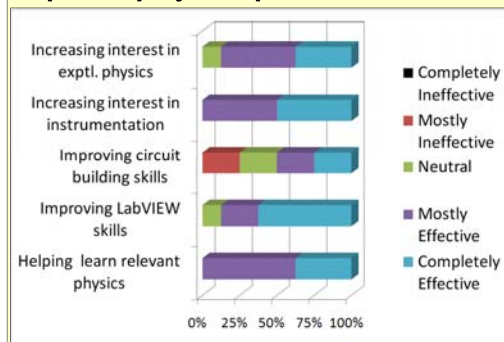


LabVIEW™ output (PMI Capstone)



STUDENT FEEDBACK

Rate the following aspects of the capstone project experience:



Student Comments:

- "I liked that it related back to something we did in Advanced Phys. Lab."
- "I enjoyed the freedom we were afforded to explore our own solution. Even though the TA knew his method would work, he allowed us to devise our own project!"
- "I liked the open-endedness of it. I enjoy being a self-starter, so this was great for me."
- "The time was short for our project to be completed by the time we presented it."
- "It was difficult to get everyone to work a decent amount and impossible for everyone to work simultaneously."