

# Instrumentation Board Choices

## What is a Personal Instrumentation Board?

ECSE requires knowledge of measurement equipment like:

1. Multimeters
2. Oscilloscopes
3. Source Measure Units
4. Function Generators
5. Spectrum Analyzers
6. Ohmmeters
7. Impedance Meters
8. DC Power Supplies
9. Etc. etc.

These benchtop pieces of equipment are the best possible way to get accurate measurements of a system BUT they are costly, you can't use open-source code like C, C++, and Python typically with them, AND you can't carry them around wherever you go.

Thus, the Personal Instrumentation Board was innovated in part by Prof. Don Millard (for RPI professor with a Mobile Studio board in 1999). From this prototype the following new learning/educational boards were inspired. Doug Mercer, [an RPI ECSE Hall-of-Famer](#), founder of the [Mercer Lab](#) (*on the JEC 6<sup>th</sup> floor that house the BEST of the above benchtop equipment for your use*), and Advisory Board member invented and is still the technical facilitator for the M1K and M2K board. All Personal Instrumentation Boards have some combination of the equipment above in a small form factor that connects directly to your USB port of your laptop. There are tradeoffs/limitations to each one. For Intro to ECSE, you can decide to use either the M2K or the Analog Discovery 2 board. Both of these boards can be used in multiple of your future ECSE courses.

[ADALM2000 \(M2K\)](#) (~\$180-\$300 depending on where you buy it. Better than M1K and will be used in future courses)

[Analog Discovery Board 2](#) (~\$400 this price has more than doubled in about 5 years due to high demand and simply being the BEST Personalization Board that covers all needs for our classes....this price is a major limiting factor)

What are the options for Intro to ECSE?

***ADALM2000 (M2K) Board IT'S \$237-\$300 depending on where you buy...better!***

- Now being used in ECSE 2010, ECSE 2050, likely other future courses
- Has a current limitation that may prohibit circuit that draws a lot of current >50mA
- RPI Bookstore \$300 <https://www.bkstr.com/rpistore/product/adalm2000-board-126261-1>
- Mouser \$237 <https://www.mouser.com/ProductDetail/Analog-Devices/ADALM2000?qs=xbccQsLEe0e03sUxIHWPSw%3D%3D>

***Analog Discovery Board 2 \$300+...they know they are the BEST one...***

- It just works for every class, every time...very little bugs...better current limit 750mA
- Higher frequency limits
- Better GUI for all functions: Scope, Function Generator, Spectrum Analyzer...
- Mouser \$300 <https://www.mouser.com/ProductDetail/Digilent/410-321?qs=Nn1VXUNwu%252B%2FKDxSaX7E8gA%3D%3D>