**MOTIVATION**

- Large Gap in Hands-on experience of incoming First Year Students
  - Gap is widest from Male/Female and Affluent/non-Affluent high school background
  - Students with hands on experience tend to thrive, others have mixed results
  - 20% First Year Attrition
- Many Students do not know what it means to be an ECE

**Goals of New UML ECE First Year Engineering Program**

- Provide a meaningful first year hands-on design experience giving students access to test equipment, programming, and electronic design
  - Make it fun and get Students Excited about ECE
  - Try to equalize out the gaps in experience
    - Address high second year attrition by improving readiness of first year students Circuits, Logic Design and Programming
  - Do it at minimum Cost
  - Everyone Gets Hands on Experience
    - Everyone Does Every Laboratory Individually
    - Every student leaves the class having:
      - Used state of the art test equipment
      - Programmed a microcontroller
      - Built, tested, and debugged simple electronic circuits

**Scalability and Cost Effective**

- University Goal to have max 19 students per lab section
  - Class with 200 Students (11 sections @ 2 hours=22 hours/week) Labs with 19 sets of equipment do not exist
  - Goal to have students purchase and maintain their own lab at a 1 time cost of less than $200.00
  - Students can work on labs anywhere there is a computer!
  - Modular Course Structure so can be offered as blended or conventional course

**CONCLUSIONS**

**UML FY LAB in the Box**

- Discovery Kit ($99) has:
  - Oscilloscope
  - Waveform generator
  - Voltmeter
  - Power Supply

Our first year hands on curriculum based on the Analog Devices Discovery Module lab in the box was a success and will be continued

- Change how labs are designed and executed (move to open lab format)
- Every student has access to a state of the art electronics test bench starting year 1
- Would like to move to having all students purchase their own lab and use it in years 1 through 4
- Requires buy in from all faculty teaching labs