National Engineering Mathematics Consortium

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Sustaining Engineering Math after CCLI

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Summer Advantage Program

http://summer.wsu.edu/advantage/

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An opportunity to adjust gradually to the new academic demands of college life ...

- Summer Advantage is a time for you to begin the transition to college life through tailored programming, peer and professional support, and planned recreational activities. Become familiar with the WSU campus and learn the most effective techniques for academic achievement through time management, study skills, and leadership workshops.
- Earn six college credits in five weeks.
- Fulfill a Humanities [H] or Written Communication [W] or Mathematics Proficiency [N] general education requirement [GER].
- Discover campus resources.
- Develop leadership skills.
- Explore WSU in a supportive, academic, residential program.
- Participate in organized activities.
- Build a community of friends.
- Make WSU your home away from home.
- Enrich your life through University Recreation.

This is how they sell it … My marketing is done!

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Possible Summer Advantage Class Schedule

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Time	Monday	Tuesday	Wednesday	Thursday	Friday
9:00					
9:30					
10:00	Engineering 107 or Human Development 205	Engineering 107 or Human Development 205	Engineering 107 or Human Development 205	Engineering 107 or Human Development 205	Engineering 107 or Human Development 205
10:30					
11:00					
11:30					
Noon	Lunch				
12:30					
1:00					
1:30	English or Music 262	English or Music 262	English or Music 262	English or Music 262	English or Music 262
2:00					
2:30					
3:00					
3:15	Music 262 or English	Music 262 or English	Music 262 or English	Music 262 or English	Music 262 or English
3:30					
4:00					
4:30					
4:45					

Academic Redshirt Year – NSF Grant

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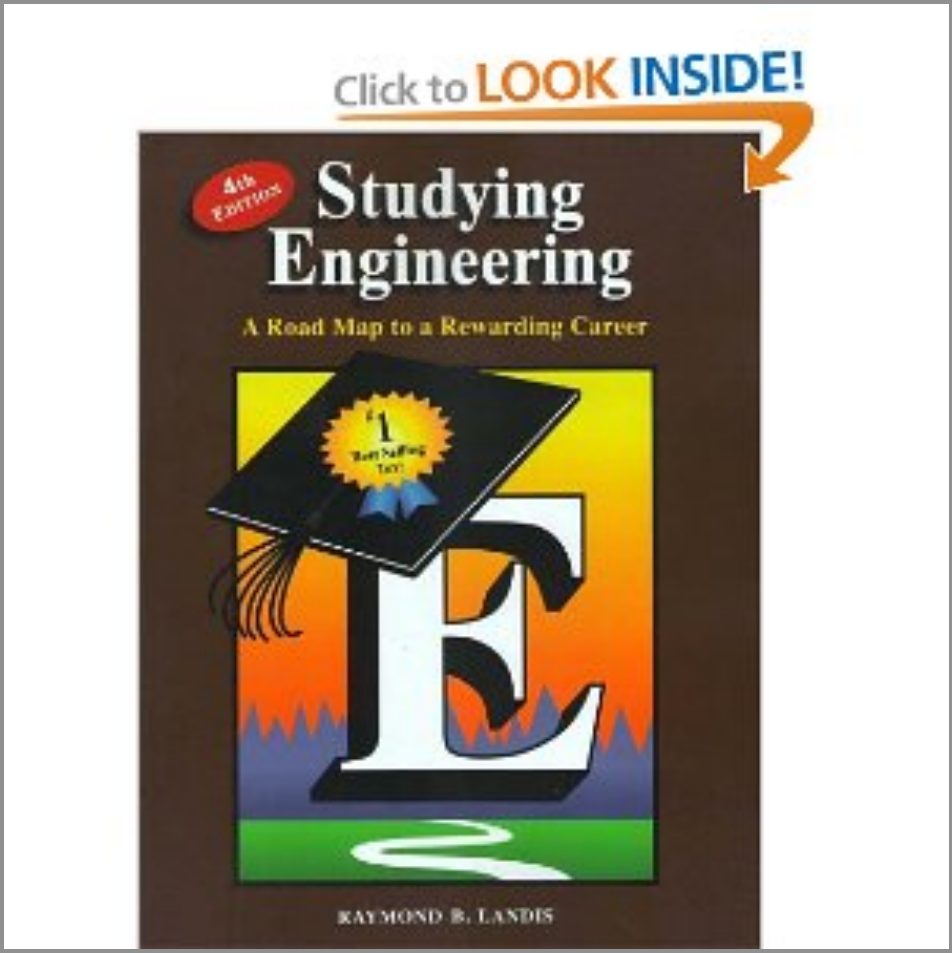
The goal of this NSF 10K+ project is to increase the retention rates of economically and educationally disadvantaged students who enroll at WSU and UW as freshmen planning on majoring in en

WSU STARS Autumn Semester:	
Math106/116 – College Algebra	5 cr
Biol 102 or alternate,	4 cr
Engr 100 – Studying Engineering	2 cr
General Ed credits	3 cr
Total credits	14 cr
WSU STARS Spring Semester:	
Engr 107 – Engineering Math	3 cr
Math 108 - College Trigonometry	2 cr
Chem 101 – Intro to General Chemistry	4 cr
Engr 120 – Innovation in Design	2 cr
General Ed credits	3 cr
Total credits	14 cr

Engineering Grad Student

Engineering 100

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- Keys to success
- Engineering Profession
- Understanding Teaching/ Learning
- Making the Most of How You are Taught
- Making the Learning Process Work for You
- Personal Growth

Enhanced Math 106

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Modelled after Math Emporium at Virginia Tech

Providing a steady pace and integrated support for undergraduate students

If you're interested in a STEM* degree, and are not quite ready for calculus then your best starting point is Math 106, also known as College Algebra. Enhanced sections of Math 106 cover the same material as the standard sections, but in smaller classes of only 30 students and with the added support of a required tutorial (Math 116). You'll meet every day during the week with the same professor and peers, learning the concepts in at a steady, manageable pace.

This new approach provides students who may not quite meet the Math 106 prerequisite or who would benefit from more support in this class with an opportunity to master and own their quantitative skills—skills that can improve your grades in this and other courses and improve your career potential.

ENGR 120…

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- 2 credit course
- Meets once per week for 110 minutes
  - Spring 2014: 1-3 credit combination
    - 1 hour web-based lecture & 3-hour laboratory

- Project-based activities
- Emphasizes hands-on learning
- Brings together engineering disciplines
- Explores a system & sub-system elements

- Focus on team experiences and group work
- Requires individual exploration of engineering

* Modeled after LATech University project – brought together many elements included in previous course development.

Course Projects…Individual

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Professional Development Project includes:

- Ethics in Engineering (required)
  - Exploring an ethical scenario in engineering vs NSPE Code
- Topics in Engineering: Connecting Written Resources
  - Grand Challenges In Engineering – *Physics for Future Presidents*
    20 Greatest Achievements of the 20th Century - Sustainability
- Design Process Challenges – 2 Competitions
  - Simple Competitions with emphasis is design process
  - Initial Design => Evaluation => Redesign => Competition
- Engineering Awareness: Presentations, Clubs or Senior Design
  - What's going on in engineering
  - What are students getting involved in?
  - What's involved in senior design projects?

Course Projects…Group

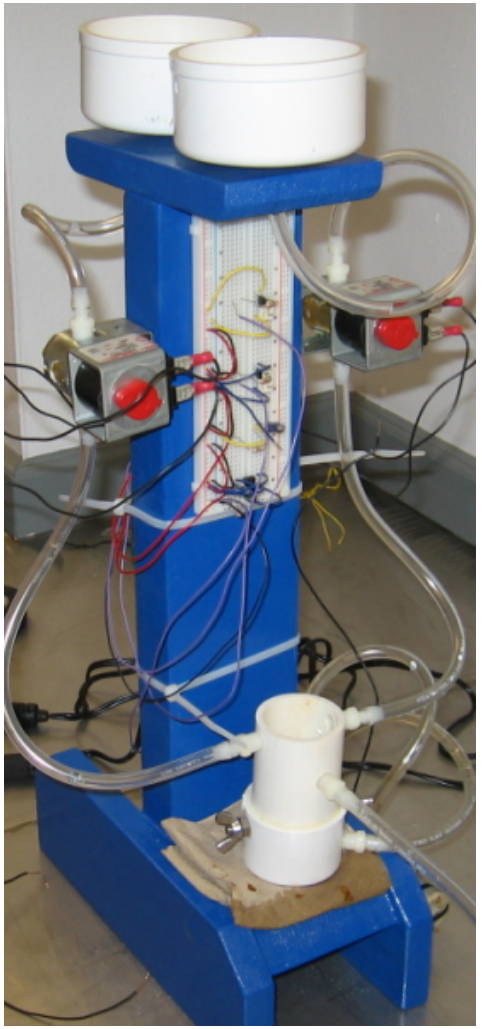
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Getting started:

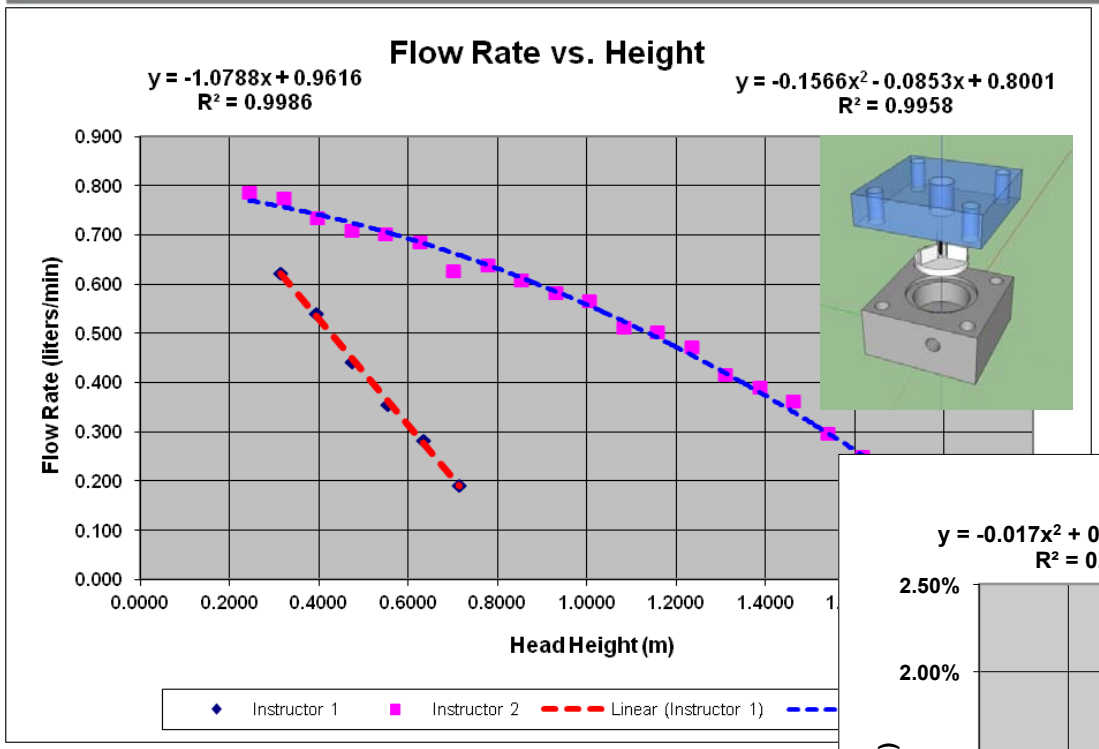
- Spreadsheets – an engineering tool!
- Beams Testing and Design
- Programming and Control Ideas

Fish Tank Project:

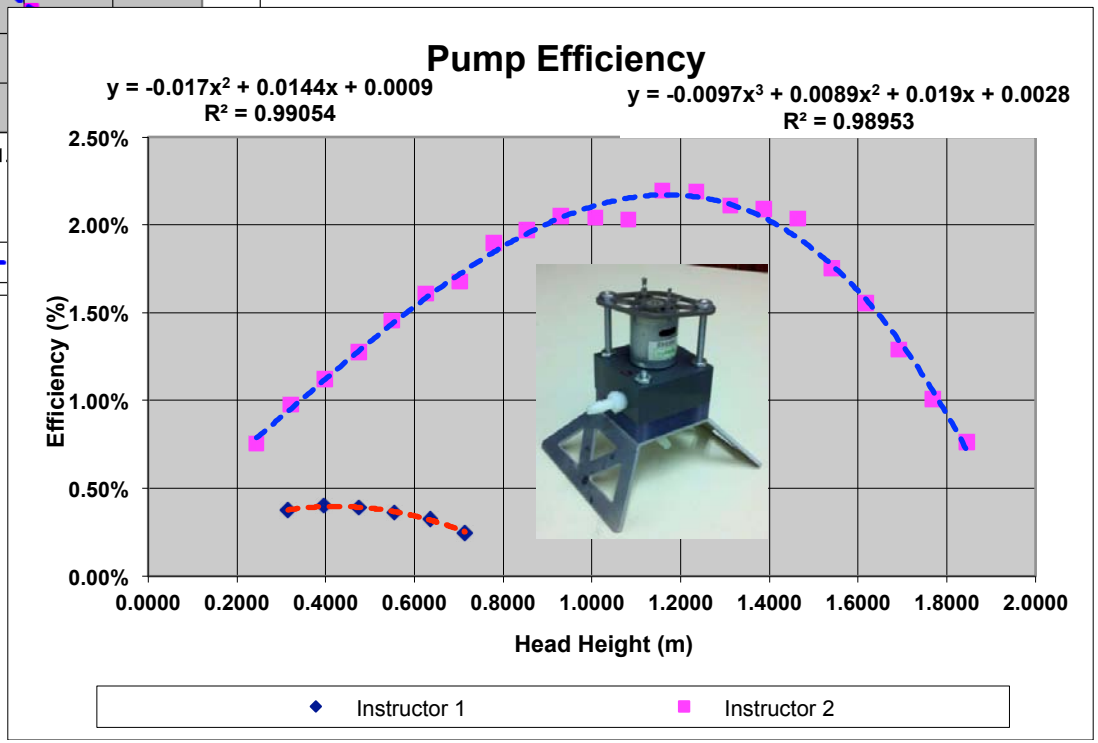
- Motor & Pump Performance
- Secondary Circuits: Controlling Devices
- Sensors Characterization and Application
- System Monitoring and Control



Motor-Pump Characteristics

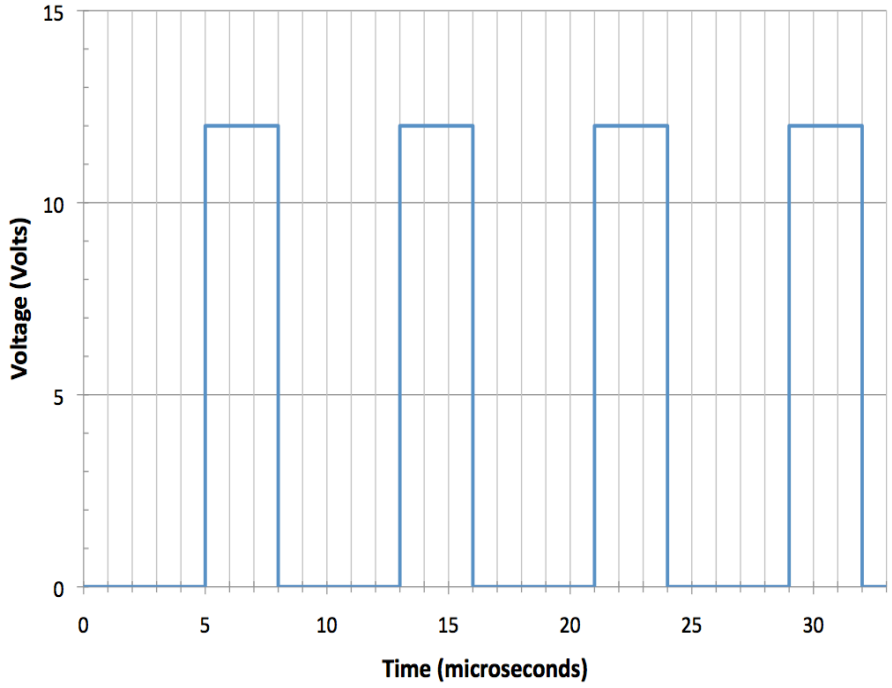


- Introduction to 3D Drawing and Printing
- Flow Rate and Energy
- Electrical Measurements

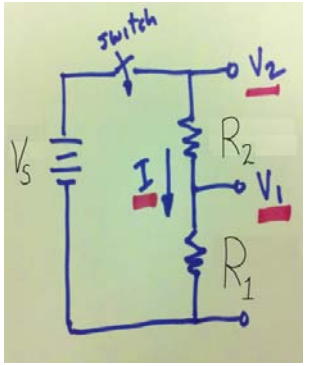


- Energy Conversion & Efficiency
- System Application

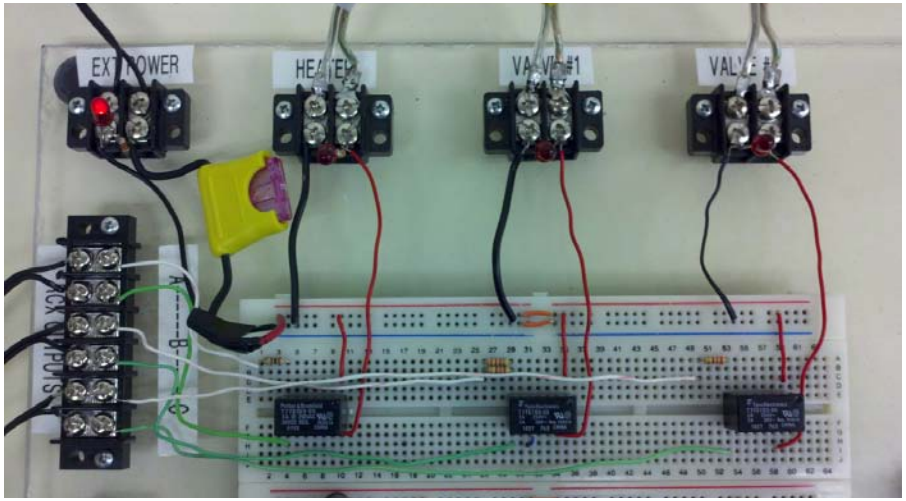
Voltage Dividers and Switching



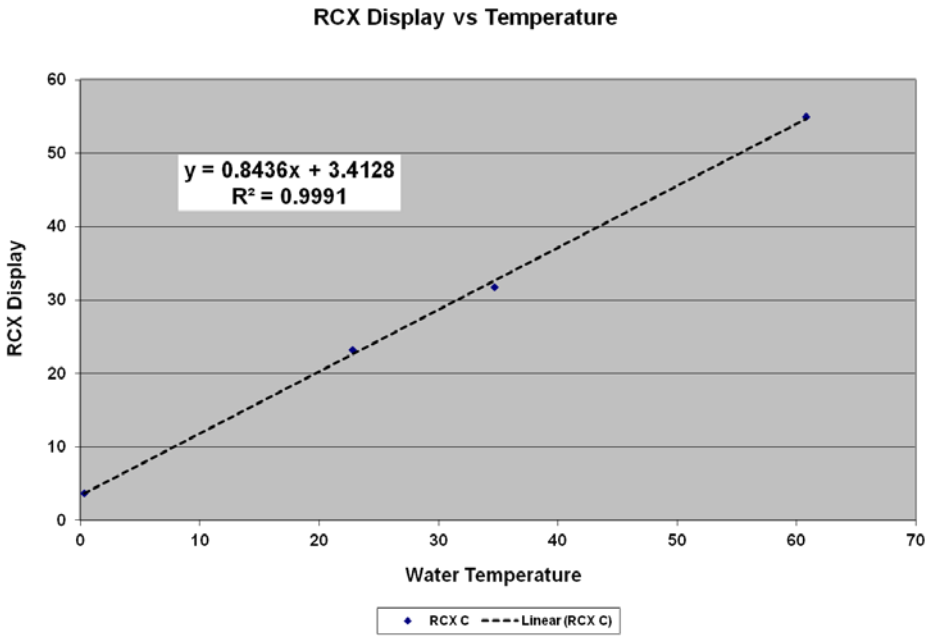
- Microcontroller Output Waveforms
- Voltage Dividers
- Relay Activation



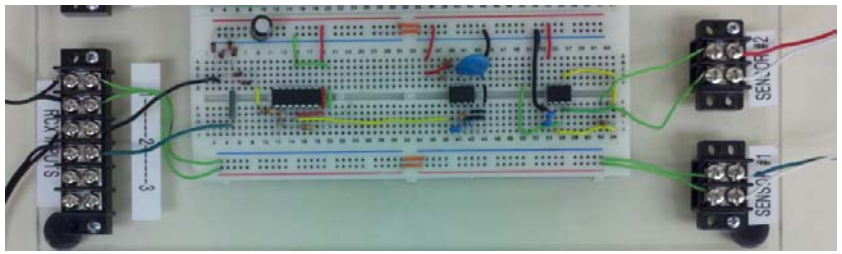
- Microcontroller Power Output
- Cascaded Switching
- Secondary Power Requirements



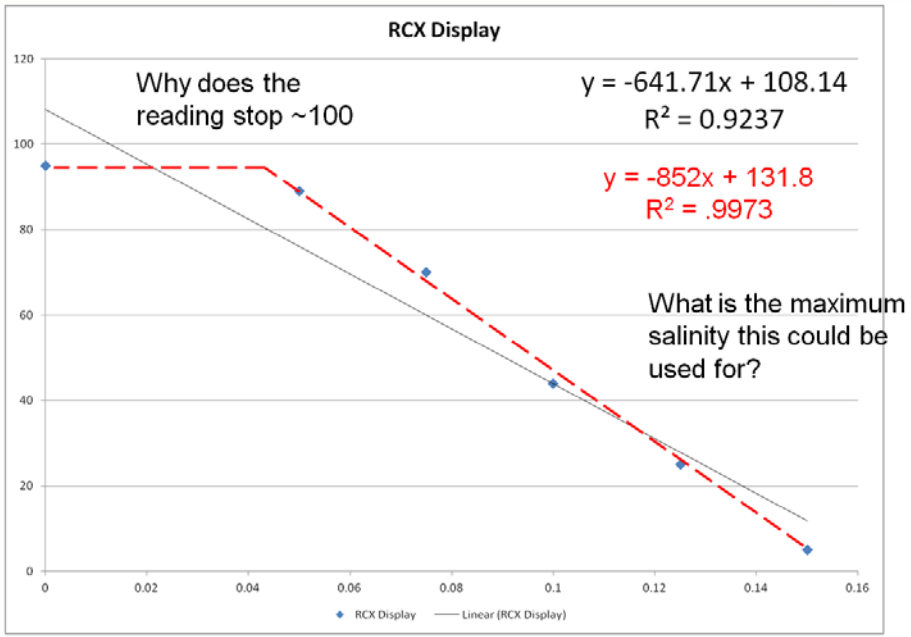
Temperature & Salinity Sensors



- Microcontroller Input /Display
- Calibration Useful Range
- Microcontroller Output Control

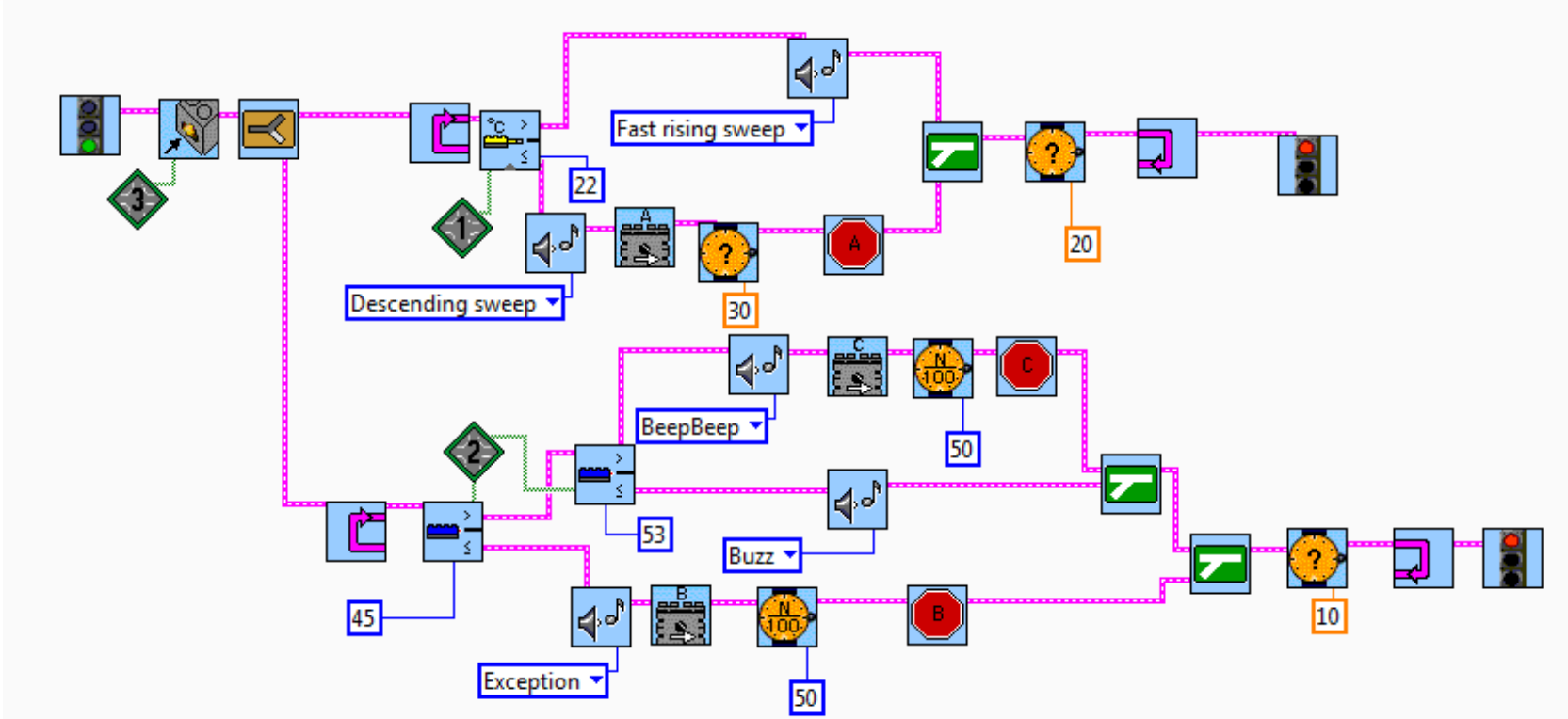


- Data interpretation
- Sensitivity
- Accuracy
- Discrimination



Programming & Control

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- Loops / Decisions
- Subroutines
- Split Tasks
- Upper/Lower Limits
- Dead band
- Prediction and Modeling