

## Path 4 - Final Exam:



Final Exam Day 0:

Soon we will begin the Final Project for Electronics / Robotics. Different groups will work on different projects.

Below are listed some projects which were done in the past. These are only suggestions. Do not feel limited by these suggestions:

Gripper

<http://parallax.com/product/28202>

Problem: Pick something up and deliver it to a particular location.

Tank Treads

<http://parallax.com/product/28106>

Problem: Navigate over rough terrain.

Crawler

<http://www.parallax.com/product/30055>

Problem: Make your boeobot into an insect and have it navigate a fairly easy course.

Note: This walks like an insect. This is fairly difficult to get working, but the difficulties are mechanical. Too tight and it does not work. Too loose and it does not work.

Line Follower

<http://www.parallax.com/product/28108>

Problem: Transverse a course by following a line.

Remote Control

<http://www.parallax.com/product/29122>

Problem: Navigate a course using IR remote control

Joystick Control (Also uses xBee)

<http://parallax.com/product/27800>

<http://learn.parallax.com/project/joystick-controlled-activitybot>

Problem: Navigate a course using radio remote control

Ping

(Sensor)

<http://www.parallax.com/product/28015>

(Bracket)

<http://www.parallax.com/product/570-28015>

Problem: Navigate a course without touching any barriers.

ANOTHER POSSIBILITY USING Ping:

Pursuit race. You have a race between pairs of robots. This is a tournament with one team being the winner. The "track" is an oval barrier that reflects ultrasonic pings. You will have your Ping units facing the port side (left side) of your robots to detect the distance to this barrier. You program your robot to keep a constant distance from the barrier as you circle it counter-clockwise. More information is available from the teacher. See

<http://learn.parallax.com/contest/individual-pursuit-race>

Text-to-speech generator

<http://www.parallax.com/product/30006>

Problem: Demonstrate computer speech.

There are some more project ideas here:

<http://www.ionaphysics.org/lobby/robotics/classroom/outline/Extra%20Projects.pdf>

(Final Project, Day 0 –Continued)

Here is how you will decide on your project:

1. Check out the following inventory of things available for your use:

Part Number	Description
27400	SumoBot
27977	Serial LCD
27979	LCD 4x20
	Ping - Ultrasonic
28015	Range finder
28017	Accelerometer
28027	PIR sensor
28106	Tank Tread
28108	Line Follower
	Scribbler (older blue)
28136	Scribbler 2 (newer red)
28136	red)
28146	GPS Module
28202	Gripper
28980	Stingray
29122	IR Remote
	Text to speech module
30006	module
30051	CMU Camera
30055	Crawler
30056	Flexiforce
30080	Say It Module
	RFID reader and tague
32390	tage
ST-00008	Tilt sensor

2. Go to <http://parallax.com> and type the part number into the search box. That will give you more information about the particular item. Clicking on the item name will probably give you even more information including programming hints, etc. Explore to get ideas.

3. Explore several different items with your partner and decide together what project you want to do.

--- END OF DAY 0 ---

## Final Exam Day 1

1. Assuming you have already chosen a project, answer the following questions:

- A. What is your first choice for a primary project?
- B. What hardware do you need? Give the name and the part number. Also list any other parts you might need which you do not already have.
- C. What will you program it to do?
- D. How will you measure success?

2. Email your answers to those questions to me. Make your answers good and complete because I will ultimately decide who gets which hardware. Brief, incomplete answers will move you to the end of the line. Deadline: ASAP but not after midnight tonight.

3. Go to the appropriate page on Parallax.com and find the instructions for your project. Save them on your computer or print them out. Also save any programs which parallax provides.

--- END DAY 1 ---

## Final Exam Day 2

1. Assuming you have already chosen a primary project, I now ask you to choose an alternate, in case the hardware for your primary project is not available. Answer the following questions:

- A. What is your second choice for a project?
- B. What hardware do you need? Give the name and the part number. Also list any other parts you might need which you do not already have.
- C. What will you program it to do?
- D. How will you measure success?

2. Email your answers to those questions to me. Make your answers good and complete. Be sure to indicate that this is your alternate/secondary choice, not your first choice. Deadline: ASAP, but not after midnight tonight.

---END DAY 2 ---

## Final Exam Rest of the marking period

1. I will distribute the hardware you need along with a schedule for submitting progress reports.
2. You will work together in the usual groups to develop your project while generating progress reports.
3. During the final few days of the marking period you will make presentations to the class which will be graded.
4. After your presentation you will disassemble your project and take inventory of the hardware you have accumulated during the semester.
5. Your final exam grade will be a composite of progress report grades and a grade for your presentation.

