CTY Introduction to Robotics (IROB) Course Syllabus
Text: *LEGO MINDSTORMS NXT: The Mayan Adventure*

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	**Introduction Video.** While the class assembles a ten minute video of past classes' robots is on the screen. **Pretest.** Each student takes the standardized pretest to determine where the class is at and provide a baseline to compare on the Week 3 Posttest. **Explorobot Preparation.** A discussion of the Design Process and demonstration of the NXT software program. The first robots are already built before lunchtime! **NXT Tutorial** Built-in NXT educational tutorials. **Worksheet 1** **Introduction to Cogito.org**	**Mars Explorer Video I** **1. Explorobot – Page 1.** As we read the story in class, think about your design. Use the supplied *Design Journal* form to enter Robot Description, Task List, constraints, Mindstorm and Sketches. **Documentation:** When your robot has run the course and been photographed, download your pictures from the classroom server, write your document and upload to your folder.	**Kit Reorganization 1.** The kits are put back in order and extra parts are sorted into the Miscellaneous bins. **2. Stringbot – Page 57.** Hear the story read, design your Stringbot, build it, photograph it and run the course! Then submit your documentation of your program, photographs and design notes to server. Video of the Stringbots will be shown later.	**Programming Quiz.** This four page graphical quiz takes you through the NXT language. **Line Follower Preparation**. A discussion of the Line Follower idea and a deeper investigation of programming principles. **Line Follower.** Teams of two construct a classic Lego Line Follower and document it with the handwritten *Design Journal* and the Word Portfolio document (including pictures).	**Mars Explorer Video II** **Mini Design Exercise.** Each student produces small programs and demonstrates them to their peers, jigsaw fashion. These mini designs are documented too. **Kit Reorganization 2.** The kits are put back in order. **Shoe Crane Project.** Assemble a crane that sits on the edge of the table and lifts a shoe off the floor. You may use one brick, one motor and one touch sensor to start the crane.
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Week 2	**3. Snapshotbot – Page 115.** Read the story, design your Snapshotbot, build it, photograph it and run the course through the Tomb Tunnel. Then submit your documentation of your program, design notes, photographs and the Mindstorms software program itself. Use the supplied Word template to begin your document.	**Sumo Robot.** Your remote controlled Sumo Robot must push the opponent out of the circle or flip it over. Teams of two will alternate controller and controlled roles. **Pillarbot.** This robot senses pillars and moves toward them to knock them over. The first part of the project is to produce independent robots that seek objects with the ultrasonic sensor.	**Pillarbot II:** Now we answer this question: what happens if several similar ultrasonic sensor robots are placed in an arena? The robots are programmed to start simultaneously with a sound stimulus. **Automata**: Graphical simulations to envision what happens when automata interact. Examples include ants, predator/prey, and Logo turtles. converging pursuit curves. **Kit Reorganization 3.**	**4. Grabberbot - Page 165.** Read the story, design your Grabberbot, build it, photograph it and run the course! Then submit your documentation of your program, design notes and photographs. **Remote controlled Soccerbots.** Soccer bots with remote control, to play soccer with the other Robotics class. Teams of four (two on controller and two on robot).	**The Soccerbot Game.** The competition is at 12 noon with the other Robotics class! Three robots plus one goalie per team. The robots are Bluetooth remote controlled. The goalie is controlled by touch sensors on wires. **Soccerbot Documentation.** Using the now-familiar Word template, document your Soccerbot. Include photographs of the event, video clips, etc. **Revisit Automota:** robots and ants and pursuit curve philosophy.
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Week 3	**Obstacle Course**: Your robot will navigate the course unassisted. Warning: the course will change each time you attempt it. **Ping Pong Ball Sorter I**. Your robot will sort ping pong balls into categories.	**Ping Pong Ball Sorter II**. Your robot will work at a higher level than before. **Final Project Planning:** The Final Project is a collaborative group of robots. Each signals to the other its needs and intentions. NXT BlueTooth allows each robot to connect to three others. Examples include simulation of an airport, a city and a complex machine such as the Mars rover. Each wheel, camera mast, solar panel and remote antenna must be run by individual robots working together as a team.	**Final Project Design and Building:** The Final Project is a large scale undertaking with	**Final Project Presentation:** The other Robotics class is invited to visit as well as Site management. **Post-test.** Retake the Pretest and see how you do! **Kit Reorganization 4.** The kits are again put back in order and extra parts are sorted into the overflow bins. **The Real Robot:** What do we mean when we say Real Robot or Real Programming?	**Documentation & Parental Visits.** Your completed Design Notebook is a wonderful artifact to give to a parent. Class is a summary of our work.