

Introduction to Robotics

Day	Time	Main Plan
1.1 Mon	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	<ol style="list-style-type: none"> 1. Introductions 2. Administrative Materials (Honor Code, Pretest, rules etc.) 3. Introduce major components of the EV3 kits 4. Students inventory their EV3 kit carefully
	Afternoon 12:20-2:30 130 min.	<ol style="list-style-type: none"> 5. Demonstrate EV3 program on the overhead projector 6. Plug sensors into brick and software to explore their capabilities
	Late Afternoon 2:45-4:15 90 min.	<ol style="list-style-type: none"> 7. Plug sensors into brick and software to explore their capabilities (cont.) 8. On a sheet of paper, students draw or describe a robot they'd like to build. They also write down their five favorite things to do in their free time.
1.2 Tues	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	<ol style="list-style-type: none"> 1. Review yesterday's learning 2. Vote on classroom rules, then post them on the wall 3. Students pair up and build the Lego EV3 base model and work through "basics" tutorials
	Afternoon 12:20-2:30 130 min.	<ol style="list-style-type: none"> 4. Demonstrate a basic program for robot movement on the overhead projector 5. Students begin to program basic movements for their EV3 base model
	Late Afternoon 2:45-4:15 90 min.	<ol style="list-style-type: none"> 6. Turning: Steering turns versus tank turns 7. Calculating wheel circumference, motor revolutions times circumference for distance, dividing distance by circumference to find motor revolutions
1.3 Wed	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	<ol style="list-style-type: none"> 1. Review yesterday's learning 2. View tutorials in "basics" and "beyond basics" in EV3 software 3. Assign Lego challenge #1, Move Object, involving turns and motorized arm
	Afternoon 12:20-2:30 130 min.	<ol style="list-style-type: none"> 4. Lego challenge #1, Move Object, involving turns and motorized arm (cont.)
	Late Afternoon 2:45-4:15 90 min.	<ol style="list-style-type: none"> 5. Lego challenge #1, Move Object, involving turns and motorized arm (cont.)
1.4 Thurs	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	<ol style="list-style-type: none"> 1. Demonstrate Bluetooth connection for robots 2. Tape down power cables and other tidying-up 3. View tutorials in "basics" and "beyond basics" in EV3 software (cont.)
	Afternoon 12:20-2:30 130 min.	<ol style="list-style-type: none"> 4. View tutorials in "basics" and "beyond basics" in EV3 software (cont.) 5. Lego challenge #2, Follow the Line with light/color sensor
	Late Afternoon 2:45-4:15 90 min.	<ol style="list-style-type: none"> 6. Lego challenge #2, Follow the Line with light/color sensor (cont.)

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1.5 Fri	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	<ol style="list-style-type: none"> 1. Lego challenge #2, Follow the Line with light/color sensor (cont.) 2. Add different color tape paths on the floor to add complexity
	Afternoon 12:20-2:30 130 min.	<ol style="list-style-type: none"> 3. Review lessons learned from Follow the Line challenge 4. Introduce Lego challenge #3, Factory Challenge, with ultrasound, gyro and light sensor and motorized arm
1.6 Sun	Evening 6:30-8 90 min.	<ol style="list-style-type: none"> 1. Review pre-course assessment test questions
2.1 Mon	Morning 9 – 11:20 125 min. <i>(15 min break)</i> (RA Visit Encouraged)	<ol style="list-style-type: none"> 1. Conclude Lego challenge #3, Factory Challenge, with ultrasound, gyro and light sensor and motorized arm 2. Review lessons learned from Factory Challenge 3. Students disassemble robots and carefully inventory all parts in their EV3 kits
	Afternoon 12:20-2:30 130 min.	<ol style="list-style-type: none"> 4. Students disassemble robots and carefully inventory all parts in their EV3 kits (cont.)
	Late Afternoon 2:45-4:15 90 min.	<ol style="list-style-type: none"> 5. Students disassemble robots and carefully inventory all parts in their EV3 kits (cont.)
2.2 Tues	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	<ol style="list-style-type: none"> 1. Demonstrate clearing PC and browser cache 2. Students build small robot from Design & Engineering module, which includes bevel gear transmission
	Afternoon 12:20-2:30 130 min.	<ol style="list-style-type: none"> 3. Challenge: program robot to measure the distance traveled, using data wires, math, merge and other blocks.
	Late Afternoon 2:45-4:15 90 min. (RA Visit Encouraged)	<ol style="list-style-type: none"> 4. Challenge: program robot to perform various functions according to color seen by color sensor (multiple switch)
2.3 Wed	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	<ol style="list-style-type: none"> 1. Review gearing up concept 2. Build and race robot dragsters
	Afternoon 12:20-2:30 130 min.	<ol style="list-style-type: none"> 3. Review gearing down concept 4. Build and test robot tractors
	Late Afternoon 2:45-4:15 90 min.	<ol style="list-style-type: none"> 5. Robot Tug-of-War!

Day	Time	Main Plan
2.4 Thurs	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	1. Lesson on EV3 array function 2. Students modify array program using brick, light sensor and touch sensor
	Afternoon 12:20-2:30 130 min.	3. Students build and program sumo robots
	Late Afternoon 2:45-4:15 90 in.	4. Students build and program sumo robots (cont.) 5. Sumo robot competition
2.5 Fri	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	1. Review lessons learned from Sumo bots activity 2. Build Lego base model 3. Copy and test array program from Lego Educator tutorial
	Afternoon 12:20-2:30 130 min.	4. Students build “Spirograph” machine which draws complex designs
2.6 Sun	Evening 6:30-8 90 min.	1. Students build “Spirograph” machine which draws complex designs (cont.)
3.1 Mon	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	1. Final project activity – begin construction, programming and testing
	Afternoon 12:20-2:30 130 min.	2. Final project activity -- continue construction, programming and testing (cont.)
	Late Afternoon 2:45-4:15 90 min.	3. Final project activity -- continue construction, programming and testing (cont.)
3.2 Tues	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	1. Final project activity -- continue construction, programming and testing (cont.)
	Afternoon 12:20-2:30 130 min.	2. Final project activity -- continue construction, programming and testing (cont.)
	Late Afternoon 2:45-4:15 90 in.	3. Watch robot-themed movie
3.3 Wed	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	1. Complete and demonstrate final projects 2. Build Lego base model for robot soccer 3. Research topics on future use of robotics; prepare short presentation
	Afternoon 12:20-2:30	4. Build Lego base model for robot soccer (cont.)

Day	Time	Main Plan
	130 min.	5. Research topics on future use of robotics; prepare short presentation (cont.)
	Late Afternoon 2:45-4:15 90 min.	6. Build Lego base model for robot soccer (cont.) 7. Research topics on future use of robotics; prepare short presentation (cont.)
3.4 Thurs	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	1. Administrative matters (post-test, surveys, SPEs) 2. Short presentations on future use of robotics & discussion
	Afternoon 1:00 --2:30 130 min. (RA Visit Encouraged)	3. Sort out parts from Lego EV3 kits 4. Watch robot-themed movie
	Late Afternoon 2:45-3:15 90 min.	5. Watch robot-themed movie (cont.)
3.5 Fri	Morning 9 – 11:20 125 min. <i>(15 min break)</i>	1. Party!