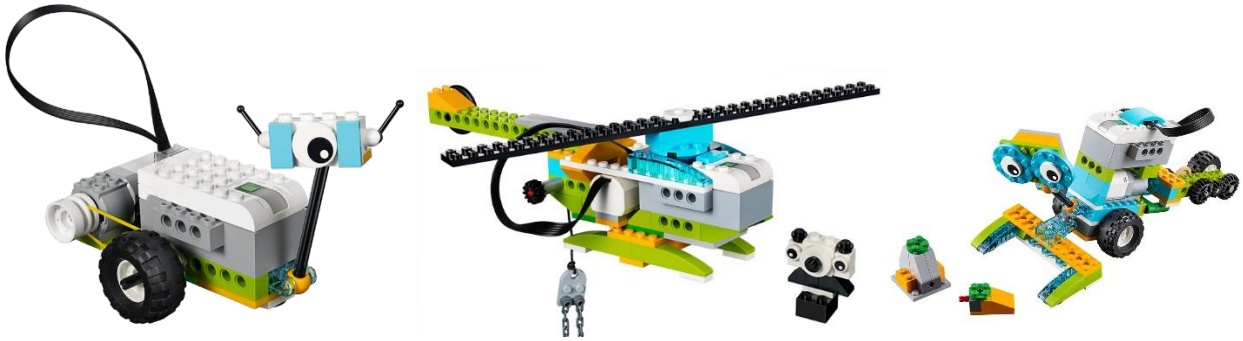
Robotics Program

BASIC AND INTERMEDIATE LEVEL

LEGO® WeDo Programming and Robotics Foundations



Learn about Lego robotics and what it takes to make a robot. Be it a car or a humanoid learn about different parts that makes a complete robot. The young robots robotics program is aimed for students who are new to robotics and have no previous experience in the field. All projects are aimed primarily at proper construction and function of the Lego robots.

Students learn to use a LabVIEW visual programming language to control LEGO® WeDo and other programmable robots. They will build and program their models with their partner while exploring a series of cross-curricular, theme-based activities to develop their skills in science, technology, engineering, and mathematics as well as language, literacy, and social studies.

As an introduction into programming and a precursor to the LEGO® Robotics Coding and Graphical Coding course, students and their teammate will be taught basic program structure using a LabVIEW visual programming language while controlling WeDo 2.0, and various other programmable robots and activities. Starting with LabVIEW allows the student to jump directly into programming logic at an early age without the need to learn code syntax. Each student and their teammate will compete with other teams to complete numerous programming challenges using the Robot Educator Model. Concepts taught and reinforced curriculum is included

COURSE OUTLINE PER WEEK

Category 1: WeDo2 Robotics			
Ages	**Course**	**Course**	**Course**
	No prerequisite	**Must have finished WeDo Level 1**	**Must have finished WeDo Level 1**
7-9	**Lego WeDo2 , Level 1**	**Lego WeDo2, Level 2**	**Lego WeDo2, Level 3**

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LEGO WeDo 2.0 (Ages 7-9)

Level	Time Period Weeks	Number of Projects to complete	Topics covered
1	4	8	Learn basic control of WeDo2 components and programming following the WeDo2 curriculum.
	2	2	Explore force and speed
	2	2	Explore nature, Frog's Metamorphosis, Plants and Pollinators

Level	Time Period Weeks	Number of Projects to complete	Topics covered **(Must have finished Level 1)**
2	1	1	Explore Robust Structures
	1	1	Explore Prevent flooding
	1	1	Explore Drop and rescue
	1	1	Explore Sort and recycle
	1	1	Explore Animal expression
	1	1	Explore Volcano Alert
	1	1	Explore Send messages
	1	1	Explore Animal senses

Level	Time Period Weeks	Number of Projects to complete	Topics covered **(Must have finished Level 1)**
3	1	1	Explore Predator and Prey
	1	1	Explore Extreme Habitats
	1	1	Explore Space Exploration
	1	1	Explore Hazard Alarm
	1	1	Explore Cleaning the Oceans
	1	1	Explore Wildlife crossing
	1	1	Explore Moving Materials
	1	1	Explore City Safety

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INTERMEDIATE AND ADVANCED LEVEL

LEGO® Mindstorms EV3 and Robotics Coding



This class serves as an intermediary class between LabView and RobotC languages. Programs are written in blocks but use coding language to control LEGO® Mindstorms EV3 robots. Students do not need previous experience, and they are taught everything they need to know to become successful programmers. Instruction is adapted for every student's level and curriculum is extended for those who come back for more.

Students are taught how to write programs in RobotC, a dialect of the industry standard C-programming language, to control LEGO® Mindstorms EV3 robots. The students will complete numerous programming challenges with a teammate using the Robot Educator Model. They are taught the language through hands-on experience and lesson plans developed by KidzCode. Like all of our courses, students do not need previous experience, and they are taught everything they need to know to become successful programmers. Instruction is adapted for every student's level and curriculum is extended for those who come back for more. In addition to the concepts taught in the LEGO® Robotics Foundations and Graphical Coding class, students will also be exposed to the programming fundamentals.

COURSE OUTLINE PER WEEK

Category 2: EV3 Robotics		
Course	**Course**	**Course**
Finished LEGO WeDo2 Level 1 and WeDo2 Level 2 or 3	**Must have finished LEGO EV3 Level 1**	**Must have finished LEGO EV3 Level 2**
LEGO EV3 Level 1	**LEGO EV3 Level 2**	**LEGO EV3 Level 3**

LEVEL 1: LEGO EV3 (Ages 10-14)

Level	Time Period Weeks	Number of Projects to complete	Topics covered	Minutes

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1	1	7	Learn basic control of EVE • Powering up your EV3 Brick • Connecting your EV3 Brick • Building your first program • Experimenting with the Large Motor • Trying out the Touch Sensor • Getting creative with the Color Sensor • Building a Driving Base Robot	**90**
	1	3	Using the Drive Base do Straight Move, Curved Move, Move Object	**90**
	1	2	• Building an Object Detector • Making your Robot detect an object	**90**
	1	1	Autonomous Parking	**90**
	1	1	Make a Sound Machine	**90**
	1	1	Make It Move and Display Speed	**90+**
	1	1	Make It Move Up and Incline	**90+**
	1	1	Make It Smarter and Adaptable robotic creature that can sense light and dark conditions and respond with different behaviors	**90+**

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LEVEL 2: LEGO EV3 (Ages 10-14)

Level	Time Period Weeks	Number of Projects to complete	Topics covered	Minutes
2	1	1	Line Detection Design ways to improve driving safety by helping to prevent drivers from falling asleep and causing an accident.	**90**
	1	1	Acceleration of Gravity The Free Fall learning module highlights the time-distance equation when an object is accelerating.	**90**
	1	1	Turn Using Sensor Your mission is to program your robot to complete a point turn to an exact angle by using the Gyro Sensor.	**90**
	1	1	Make It Smarter With Communication Design, build and program a robotic creature that can interpret different signals and respond to each with different behavior.	**90**
	1	1	Make It Smarter and Healthier Design, build and program a robotic creature that senses “food” and moves to get it.	**90**
	1	1	Switch Use the Switch block to make dynamic sensor-based decisions.	**90+**
	1	1	Make a System That Communicates Design, build and program a robotic system that follows a path and communicates its position at least twice along the way.	**90+**
	1	1	Automatic Headlights Design car features that will improve nighttime driving safety.	**90+**

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LEVEL 3: LEGO EV3 (Ages 10-14)

Level	Time Period Weeks	Number of Projects to complete	Topics covered	Minutes
3	1	1	Make It Smarter With a Sensor Design, build and program a robotic creature that can sense its environment and responds with sound and light.	**90+**
	1	1	Make It Move In a Pattern Design, build and program a robot that can move itself in a pattern that forms a repeatable shape.	**90+**
	1	1	Make It Smarter and Faster Design, build and program a robotic creature that can sense its environment and respond by moving.	**90+**
	1	1	Make a System That Moves a Ball Design, build and program a robotic system that moves a ball 90 degrees from one location to another.	**90+**
	1	1	Make a System That Picks and Places Design, build and program a robotic system that can pick up the Cuboid from one location and place it in another location.	**90+**
	1	1	Make a System That Manufactures Design, build and program a robotic system that draws a pattern, performs the task accurately and is able to repeat the task.	**90+**
	1	1	Make a System That Sorts Colors Design, build and program a robotic system that can identify at least three different colors of LEGO elements and sort them into separate locations.	**90+**
	1	1	Object Detection Design ways to avoid accidents between vehicles and objects in the road.	**90**

NOTE: Courses subject to change. Please contact us if you need other topics to cover in the program.