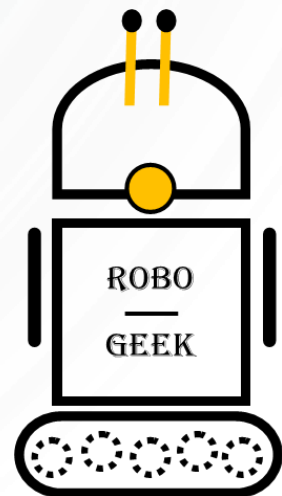




# ROBO-GEEK INC.

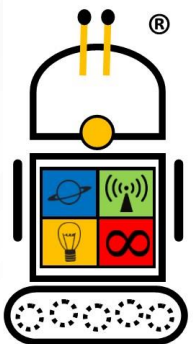
ONLINE STEM COURSES 2020



# ROBO-GEEK INC.

- **Robo-Geek** is a technology company founded by engineers to promote **STEM**, with the aim to foster students' confidence and "**I Can do it**" attitude.
- Our staff consists of *passionate engineers* who have carefully designed all the courses to ensure the best learning experience for each student.
- Our courses are designed for students in grade 2 through 12 to introduce them to the fundamentals of **Coding, Electronics and Robotics**.
- Each course includes hands-on work with computers, electronic boards, robots and unique labs that encourage self-learning and experimentation.
- Our advanced courses submerge the students in exciting subjects of **Game Programming, Java, Android Studio, Arduino with C, C# with Visual Studio, ROS (Robotic Operating System) and Robotics**. Students are encouraged to experiment and *unleash their imagination*.

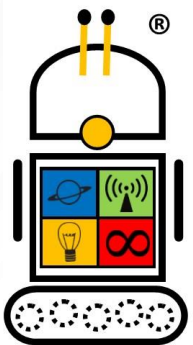
[www.robo-geek.ca](http://www.robo-geek.ca) | 1.800.414.4109



# ROBO-GEEK INC.

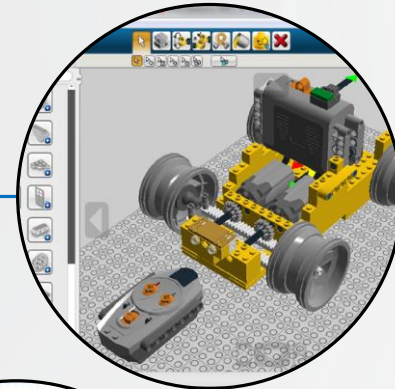
- **Hands-on Experience.** Our students learn by doing, Robo-Geek's sessions consists of fifteen minutes of lecture and 30 minutes of lab. Each Robo-Geek lab has been tested and designed to optimize topics comprehension .
- **Continuous Innovation.** Our courses are at the leading edge of technology. We pride ourselves in the development and continuous innovation of our unique labs.
- **Promotion of STEM.** Our labs and exercises focus on expanding the student's learning experience in science, technology, engineering and mathematics.
- **Swarm Robotics.** A new approach to the coordination of multi-robot systems, working together by selecting their communication patterns.

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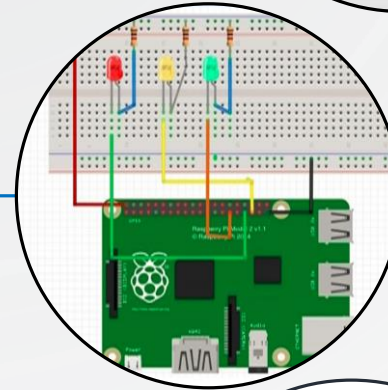


**ROBO-GEEK INC.**

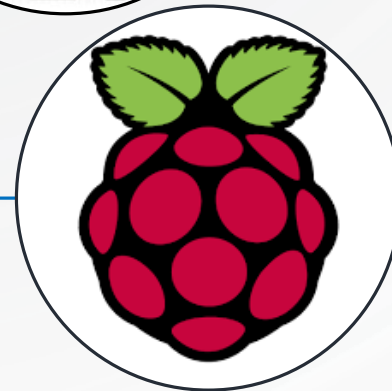
IMAGINE  
THINK  
CREATE



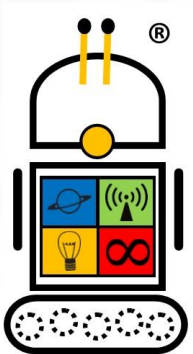
Robotics &  
AI



Electronics &  
Mechatronics



Coding  
& Apps



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# ROBO-GEEK ONLINE STEM COURSES 2020

Learn at home Coding with STEM courses.

**Coding** courses will introduce students to Python, moreover, they will learn to code their own games with Pygame



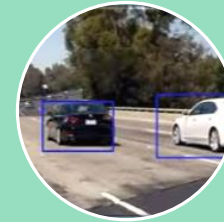
RG-120  
RG-200  
**Coding**  
Python



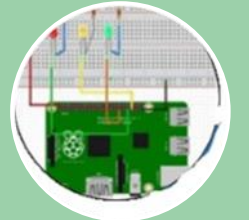
**RG-250**  
Game  
Programming I  
Python-Pygame



**RG-280**  
Game  
Programming II  
Python -Pygame



**RG-450:**  
Open CV  
(Computer  
Vision) with  
Python



**RG-300:**  
C with Arduino

← ONLINE STEM COURSES @ \$75 PER COURSE →



March 24 - April 30 2020

Time : 1.15 hour during the day.



Jr. Students 7 -8 years old

Students: 9-15 years old



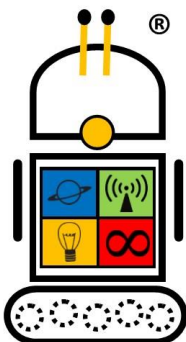
[info@robo-geek.ca](mailto:info@robo-geek.ca)



1.800.414.4109



[www.robo-geek.ca](http://www.robo-geek.ca)



# ROBO-GEEK ONLINE COURSES

## LEVEL 1

### RG-100: Intro to Coding

Students will learn the basics of programming using Scratch including introduction of variables, conditional statements and iterative loops. Our lessons are designed to challenge students to think creatively and to quickly develop their logical skills.

**Pre-requisite:** Students must be able to type 3 words per minute and be able to use the mouse.

### RG-120: Intro to Python

This course is especially designed for young coders making the transition from blocks type coding to scripts type coding using Python. Our lessons are designed for students to learn fundamentals coding while building confidence in their abilities to troubleshoot and work with more complex code.

**Pre-requisite:** RG-100 or must be able to demonstrate advanced

## LEVEL 2

### RG-200: Intro to Python – Practical

Students will be introduced to Python programming language. Python is a high-level programming language used in many universities and work institutions. Python is powerful and fast, yet friendly and easy to understand. Students will learn the fundamentals of coding using Python Turtle.

**Pre-requisite:** RG-120 or successful evaluation to start at Level 2

### RG-250: Intro to Game Programming Pygame

Students will learn step by step how to develop a working 2D game from designing characters, game rules and developing multiple game levels. In this course students will be introduced to Object Oriented Programming using Python Pygame. Games are highly portable capable to run on nearly every platform and operating system.

**Pre-requisite:** RG-220

### RG-220: STEM + Python Turtle

Students will learn about three STEM subjects: Solar System, Bridge Building and Gravity. For each subject, students will create programs in Python to simulate and demonstrate understanding. This course is based on the material developed in our STEM Club.

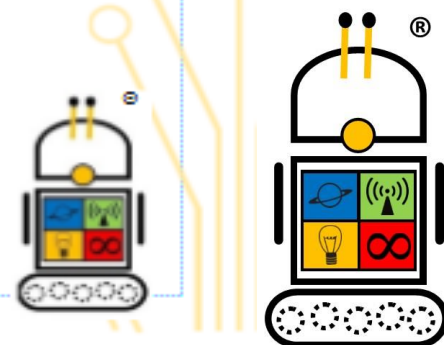
**Pre-requisite:** RG-200

### RG-280: Advanced Game Programming

Students will develop a multi-level game using Pygame using Object Oriented Programming integrating all the concepts

learned in RG-250

**Pre-requisite:** RG-250



# ROBO-GEEK ONLINE COURSES

## LEVEL 3

### RG-300: Intro to Arduino

Students will learn coding in C with Arduino Uno Wi-Fi Board working with digital interfaces to control different arrays of LEDs. Moreover, students will learn basic concepts of Electronics and Electricity through experimentation and hands-on activities including building of circuits on breadboards.

Pre-requisite: Level 2 courses

### RG-350: Arduino Advanced –TinkerCad

Working with simulators is a fundamental skill required in Engineering to develop troubleshooting and collaboration skills. Moreover simulators help students develop discipline to conduct tests prior to prototyping. We selected TinkerCad for this purpose. In addition can continue practicing at home as they will have their own accounts.

### RG-450: Intro to Computer Vision

In this course, students will learn about the foundations of Computer Vision using Python OpenCV. This course is fundamental to prepare students for more difficult and concepts in robotics and machine learning.

Pre-requisite: RG-400

### RG-480: Advanced Computer Vision Part I

This course teaches students practical applications of computer vision in robotics and mobile applications such as QR code recognition, OCR recognition. Last part of the course focuses on integration with the application of AI to play checkers.

Pre-requisite: RG-460

## LEVEL 4

### RG-460: Intermediate Computer Vision

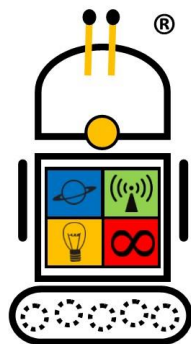
In this course students learn how to apply advance algorithms using OpenCV for image processing including shape detection and object detection.

Pre-requisite: RG-450

### RG-490: Advanced Computer Vision Part II

This course teaches students practical applications of computer vision in robotics and mobile applications such as QR code recognition, OCR recognition. Last part of the course focuses on integration with the application of AI to play checkers.

Pre-requisite: RG-480



# ROBO-GEEK ONLINE COURSES

## LEVEL 5

### RG-500: Advanced Coding C#

Students will learn C# (C Sharp) using Visual Studio. Students will learn Visual Studio with C#, they will write code and learn about variables, Loops,

Conditional Statements, how to use classes. They will learn how to troubleshoot in C#, they will have to write their own code and methods to complete challenges.

**Pre-requisite:** Level 4 courses

### RG-520: Advanced Coding C# Part II

Students will learn advanced programming techniques using Visual Studio using C#. Students at this level

will be working independently on projects : Creating Forms, Drawing Shapes and Bingo APP; they will have to add and supported by the instructor.

**Pre-requisite:** RG-500

## LEVEL 6

### RG-600: Intro to AI - Chess Master

Students will learn the foundations of artificial intelligence by developing a chess game AI. The course starts with understanding the fundamental of chess game, followed a step by step approach to building AI code using Python Tkinter.

**Pre-requisite:** Level 5 courses

### RG-650: Intro to Self Driving Car

In this course, students will learn fundamentals of Self Driving cars using Python OpenCV from

detecting cars, traffic lights and lane detection.

**Pre-requisite:** Level 5 courses. RG-600 Preferred.

## LEVEL 7

### RG-700 Advanced Coding: Java

Students will learn fundamentals of Java, type of variables, statements and operators, arrays, methods, and control structures.

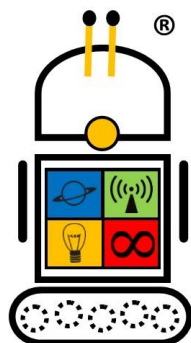
**Pre-requisite:** Level 6 courses

### RG-710: Advanced Coding: Advanced Java

This course will expand Object-oriented programming System (OOPs) concepts. We will cover each and every feature of OOPs

in detail : Abstraction, Encapsulation, Inheritance and Polymorphisms. The section for Input /Output has included here too.

**Pre-requisite:** RG-700





# ROBO-GEEK ONLINE COURSES

## LEVEL 7

### RG-720: Advanced Coding: Android Studio with tablets

Android Studio is a powerful tool based on Java. Students will learn how to work with API (Application Programming Interfaces), Project Structure, gradle, libraries, methods, `onCreate()` method, `MainActivity` and XML Layout. Students will learn how to create Apps for Android Tablets using Android Studio.  
**Pre-requisite:** RG-710

### RG-750: Advanced Coding: Android Studio with Sanbot Elf

Students will learn how to work with API (Application Programming Interfaces), Project Structure, gradle, libraries, methods, `onCreate()` method, `MainActivity` and XML Layout. Students will learn how to different managers to control Sanbot Elf robot.  
**Pre-requisite:** RG-720 (Offered in Milton location only)

### RG-780: Advanced Coding: Android Studio with Sanbot Elf II

This is an advanced course where students will learn how to create more complex Apps in Android Studio for Sanbot Elf robot. They will make a 6-memory card game and 20 cards-memory game having only the description of the most important blocks of code. The students will work with Face Recognition App too.  
**Pre-requisite:** RG-750 (Offered in Milton location only)

## LEVEL 8

### RG-800: Advanced Robotics: ROS-1

Students will learn Unix commands, scripts and editors in Ubuntu 16.0 and the fundamentals of ROS (Robot Operating System), ROS packages, manifests, ROS nodes and topics and messages. Libraries covered `Turtlesim` and `TurtleBot 2`.  
**Pre-requisite:** Completion of Level 7

### RG-820: Advanced Robotics: ROS-2

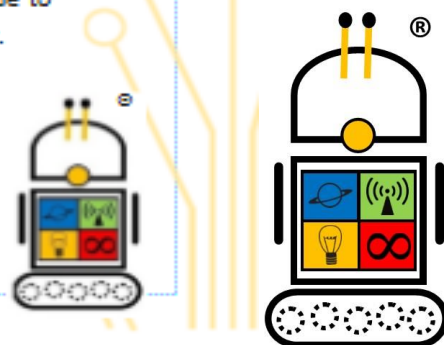
Students will learn about different kind of robots in ROS: Turtlebot 2 and Turtlebot 3. Then students will create and build ROS packages, will create a Robot and add the wheels and Robot Design. Robots will be simulated in Gazebo.  
**Pre-requisite:** RG-800

### RG-850: Advanced Robotics: ROS-3

Students will learn Robot Design with `Xacro` Files controlling Robotics Arm. In the second part students will install Ubuntu and ROS in RPI (Raspberry Pi)  
**Pre-requisite:** RG-820

### RG-880: Advanced Robotics: ROS-4

Students will work inside ROS to communicate RPI with client. Students will learn Python code to subscribe and publish their cameras. RPI simulates a Robot.  
**Pre-requisite:** RG-850



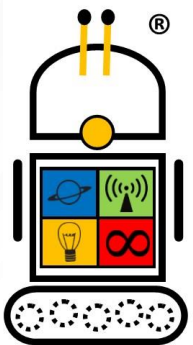
# ONLINE STEM COURSES.

- **Sessions:** STEM courses will last 1.15 hour every day for 5 days. Parents can register their children in the course that they were assessed.

Courses that will not need a pre-requisite course are RG-100 “Intro to Coding with Scratch” and RG-120 “Intro to Python”.

- **Online Hardware and software at home.** The students will need a PC or laptop at home with Windows 10. Our technical staff will coordinate with you to install remotely the required software at the laptop or PC to run the courses. It will take maximum 45 minutes to do it.
- **Courses.** Currently Robo-Geek has eight levels in their courses.
  - Level 1: RG-100 and RG-120
  - Level 2: RG-200, RG-220, RG-250 and RG-280
  - Level 3: RG-300 and RG-350.
  - Level 4: RG-450, RG-460, RG-480 and RG-490

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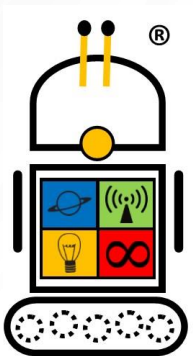


# CODING

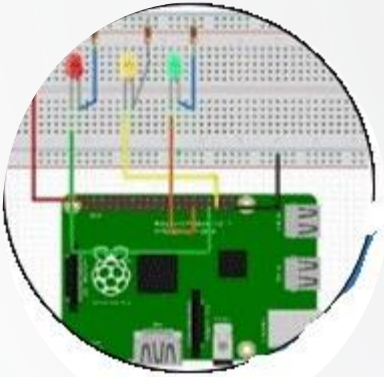


Students will learn Python; where they will be able to write code and with Pygame they students will create their own games. They will also learn Computer Vision with CV to learn about autonomous cars.

**Goal: Learn how to write code in Python**



# ROBOTICS-ELECTRONICS- ARDUINO



Students will learn **C** with **Arduino boards**; **C** is a high-level programming language that allows programmers concepts in fewer lines of code. Moreover, they will write sketches ( code in C) to control the Leds.

**Goal: Learn how to build controls for robots using Arduino.**

