



Our Future:
Built Better Together



#firstinspires

Intro to Programming with Romi

Overview

Project Summary:

In this self-paced 5 to 9-week course, students will learn a fundamental understanding of Java programming within WPILib and obtain applicable object-oriented programming skills. Students will learn and apply programming concepts in Java while programming a robot to complete challenges presented in each module. Students can collaborate and share knowledge and information with other team members and even other teams to help transfer the programming skills learned to their *FIRST* Robotics Competition team.

Project Scenario:

The modules are designed around project scenarios that connect learning with real-world examples. The overall course project scenario is that students work as software engineering interns in a transportation and logistics company. They are charged with programming a robot that can deliver objects in the warehouse. You can control the robot in some locations, but you do not have the visibility to control it in others. The robot must deliver with precision while providing feedback along the way on the robot's location, speed, and status.

Needed Materials

- A *FIRST*® Romi robot from [Pololu](#)
- A Raspberry Pi (Model 3B+ or 4)
- An SD card reader/writer.
- A supply of AA batteries (preferably rechargeable ones will save time and money.)
- A PC computer with wireless access (WPILib is not compatible with chromebooks)



Scope and Sequence

5 Lessons; 10-20 Activity Hours

Module 1

Unit	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Hours
Set-Up	■					2 - 4
Programming Robots		■				2 - 4
Using Methods and Objects			■			2 - 4
Conditionals				■		2 - 4
Variables and Equations					■	2 - 4

Outcome:

Students will learn the fundamentals of object-oriented programming using the WIPLib and Java with the Romi hardware. They are introduced to objects, methods, and variables. These concepts are applied to a robotics framework with timed-based robot projects with an introduction to command-based robot projects.

Scope and Sequence

6 Lessons; 12-24 Activity Hours

Module 2 – Available November 2021

Unit	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5	Lesson 6	Hours
Command-Based Programming	■						2 - 4
Arrays and Loops		■					2 - 4
Robot Driving and Inputs			■				2 - 4
Advanced Conditionals				■			2 - 4
Command Groups					■		2 - 4
Interpreting Exceptions						■	2 - 4

Outcome:

Students build on skills developed in Module 1 to diver deeper into command-based programming and utilizing inputs and sensors. They learn how to use joysticks as well as a built-in gyro for navigation.