Introduction to mBot Robotics
Suitable for: G7 - G10

Prerequisite: None
Duration: 26 Weeks
Classes per Week: 1 class (45 minutes each)

Course Overview:
This course introduces students to robotics and programming through the use of the mBot robot. Students will learn to control and program mBot, exploring fundamental robotics concepts such as movement, sensors, and LED displays. By the end of the course, students will be able to build simple robot behaviors, understand basic robotics components, and use programming to create interactive mBot projects.

Covered Topics

Unit 1: Getting Started with mBot

- Introduction to the mBot manual and understanding the components
- Learning about mBot and its capabilities
- Connecting mBot to devices and uploading basic programs

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Unit 2: Basic Movements and Controls

- Programming mBot movements and controlling direction
- Using remote control and creating interactive movement patterns
- Implementing line-following capabilities for autonomous navigation

Unit 3: Sensors and Obstacle Avoidance

- Understanding and using the ultrasonic sensor for distance measurement
- Programming mBot for obstacle avoidance and navigating around objects
- Advanced line-following with obstacle avoidance features

Unit 4: LED Displays and Communication

- Displaying messages on mBot's LED matrix
- Customizing LED text and symbols for creative expression
- Using message broadcasting to control mBot actions in response to commands

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Unit 5: Final Projects and Special Features

- Using the ME LED Torro, LED Bar Graph, and 7 Segment Distance for complex displays
- Integrating multiple components for projects like a light show and “mBot dances in the dark”
- Final project: Creating an interactive mBot performance demonstrating learned skills

Materials Needed:

- mBot kit (including sensors, LED displays, and necessary connectors)
- Computer or tablet
- Internet connection for programming and resources

Assessment

At the end of each lesson, learners will be assessed on their ability to apply programming concepts with mBot, including movement, sensor integration, and LED displays. Assessments will focus on creativity, problem-solving, and the functionality of their programmed behaviors.

Certification

A certificate of completion will be awarded to students who successfully complete the course, recognizing their foundational skills in robotics and programming with mBot.