mBot2: Smart Home Robotics Syllabus

The mBot2: Smart Home Robotics Curriculum is divided into 7 Units, a total of 21 Missions, and a Smart Home Showcase Challenge. Each Unit uses the 5Es (Engage, Explore, Explain, Elaborate, Evaluate) model for teaching. Activities are based on "Hands-On Minds-On" and discovery-problem based learning. Because mBot2 is powered by CyberPi, the course begins with smart device fundamentals before expanding into mobile robotics. This program immerses students in STEM education while developing essential 21st-Century skills: critical thinking, collaboration, communication, and creativity.

Overview

Grades: 3-8
Ages: 8-14
Level: Beginner/Intermediate
Course Length: Adjustable 25 to 40 hours
# of Lessons: 21

Unit	Description	Lessons	Key Concepts
Phase 1: CyberPi Foundations — Smart Devices			
1	*What is CyberPi and what can it do?*	Mission 1 - Meet CyberPi Mission 2 - First Program Mission 3 - WiFi Setup	CyberPi Hardware mBlock Software Troubleshooting Connectivity
2	*How can CyberPi become a smart assistant?*	Mission 4 - Voice Recognition Mission 5 - Smart Lamp Mission 6 - Text-to-Speech	AI Voice Commands Speech Synthesis IoT Concepts NLP
Phase 2: mBot2 Robotics — Smart Home Assistant			
3	*How does CyberPi control a robot?*	Mission 7 - Build mBot2 Mission 8 - Components Mission 9 - Movement Code	Robot Assembly mBot2 Shield Motors & Encoders Basic Movement
4	*How can we speak to mBot2?*	Mission 10 - Voice Movement Mission 11 - Speed Control Mission 12 - Custom Commands	Voice Control Variables Conditionals User Input
5	*How can mBot2 sense its environment?*	Mission 13 - Obstacle Detection Mission 14 - Color Recognition Mission 15 - Room Navigation	Ultrasonic Sensor RGB Sensor Autonomous Nav Decision Making
6	*How can mBot2 help someone at home?*	Mission 16 - Design Process Mission 17 - Build & Program Mission 18 - Test & Iterate	Engineering Design Prototyping Problem Solving Iteration
7	*How do we present our innovation?*	Mission 19 - Prepare Presentation Mission 20 - Showcase Event! Mission 21 - Reflection	Communication Presentation Peer Feedback Celebration