

Building Robots with TJBot

At a Glance

Learn how to program a simple robot (TJBot) to move its arm, recognize objects, flash a light, speak, and more. You can build simple apps to control TJBot by using Node.js or even Node-RED. If you don't want to purchase the TJBot, you use a simulator instead.

This course is for all those do-it-yourself Node.js or Node-RED programmers who want to learn IoT basics. You can purchase the TJBot if you don't already have one or run it in a simulator, so no purchase necessary! You'll use artificial intelligence services (Watson) to program the robot to recognize objects and color, translate speech to text, recognize and translate languages, and analyze emotional tones in text. You should have basic programming experience with either Node.js or Node-RED. Experience with programming IoT devices is not required. You must have a Pay-As-You-Go or subscription IBM Cloud account. For this course, you can program the physical TJBot or use a simulator that will mimic the actions, speech, and sounds of the robot. If you use the simulator, you need only a web browser. If you want to use the physical robot, you can create the same project files on the Raspberry Pi and run the Node.js application. TJBot can be programmed in Node-RED, Swift, Python, and Node.js. This course will use a Node.js simulator that mirrors the real bot to make it accessible to everyone. This code can be copied over to the Raspberry Pi and run as-is with little modification..

1. Get started

- Objectives
- Prerequisites
- Course labs
- Grading

2. TJBot and IBM Watson

- TJBot overview
- TJBot and IBM Watson services

3. Set up your environment

- Use the simulator or the physical bot
- Option 1: Access the virtual simulator
- Option 2: Configure the physical bot

4. Quick labs

- Overview
- Lab 1: Move the robot's arm
- Lab 2: Shine and pulse the LED light
- Lab 3: Make the robot see
- Lab 4: Convert speech to text

- Lab 5: Translate language
- Lab 6: Make the robot speak
- Lab 7: Make the robot recognize tone
- Lab 8: Make the robot chat
- Graded review questions

5. Complex labs

- Overview
- Lab 9: Converse with TJBOT
- Lab 10: Detect tone in audio and react with a colored light
- Lab 11: Recognize objects and say them out loud
- Graded review questions