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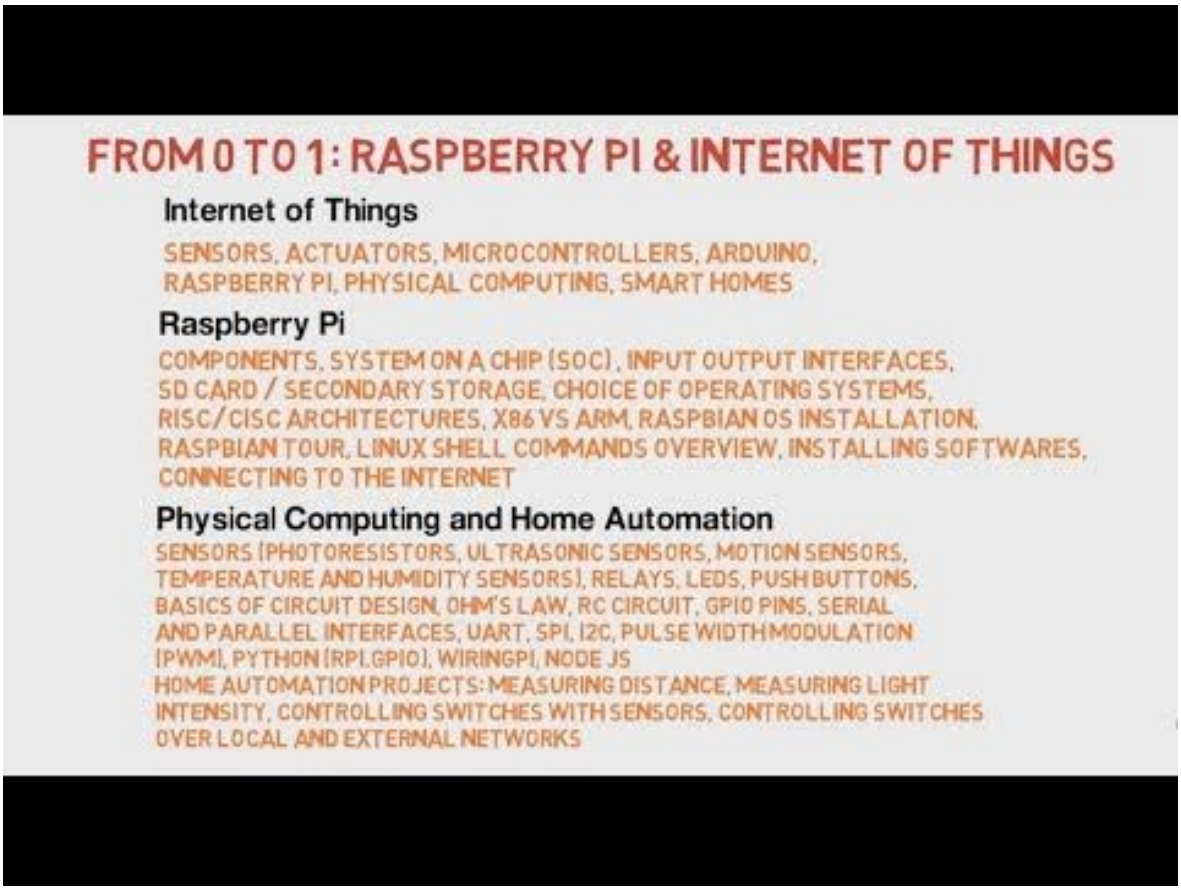
**Learning Style: On Demand**

**Technology:**

**Difficulty: Intermediate**

**Course Duration: 7 Hours**

# From 0 to 1: Raspberry Pi and the Internet of Things




Taught by a team of electrical engineers from Stanford and IIT Madras.

*An Internet-Of-Things course for everyone - accessible yet serious, to take you from absolute beginner to a solid intermediate level - built around Home Automation using Raspberry Pi.*

This is a course is for everyone. You need not be an electrical engineer, or an

engineer at all. We explain all engineering or automation concepts from absolute scratch.

This is an Internet-of-Things course, not merely a Raspberry Pi course. This is important because we think too many courses end up becoming like manuals for the Raspberry Pi, or the Arduino, or some specific hardware device. This course is careful to generalize

The course takes you to a solid intermediate level. The objective is to get you to a point where if you imagine a really cool IoT application, you will be able to independently figure out how to implement it.

We focus on Home Automation using Raspberry Pi for our use-cases. This is so that you can immediately put it to use around the home (turn that music down without getting off the couch!)

As with all our courses, this one too is *quirky*. The examples are irreverent. Lots of little touches: repetition, zooming out so we remember the big picture, active learning with plenty of quizzes. There’s also a peppy soundtrack, and art - all shown by studies to improve cognition and recall.

**Course Objective:**

Internet of Things : Sensors, Actuators, Microcontrollers, Arduino, Raspberry Pi, Physical Computing, Smart homes

Raspberry Pi 2 Model B Components, System on a Chip (SOC) , Input Output Interfaces, SD Card / Secondary Storage, Choice of Operating Systems, RISC/CISC Architectures, x86 vs ARM, Raspbian OS installation, Raspbian tour, Linux Shell commands overview, Installing softwares, Connecting to the Internet

Physical Computing: Sensors (Photoresistors, Ultrasonic sensors, motion sensors, temperature and humidity sensors), Relays, LEDs, Push buttons, Basics of circuit design, Ohm's law, RC circuit, GPIO pins, Serial and Parallel interfaces, UART, SPI, I2C, Pulse Width Modulation (PWM), Python (RPi DOT GPIO), WiringPi, Node js (RPi-GPIO)

Home Automation projects: Measuring Distance, Measuring Light Intensity, Controlling switches with sensors, Controlling switches over local and external networks.

**Audience:**

- Anyone who is interested in Internet of Things, Physical computing, hardware hacking and wants to get their hands dirty with real projects
- Non-engineers / Non-tech persons who are interested in home automation projects or Raspberry Pi
- People who are looking to understand the details of IoT and want to think of new startup ideas in the IoT space or work in this space
- Engineers who have book knowledge but want some help with practical

application of electronics concepts

**Prerequisite:**

- No real prerequisites. Beginner level understanding of electric circuits and programming might help but its not mandatory
- If you intend to do the physical computing projects, go ahead and purchase a Raspberry Pi - but the course does give you advice on things you might need to get for your automation projects so you can wait to decide as well.

## Course Outline:

- What this course is about
- What is the Internet of Things?
- Pi's Anatomy
- Getting Started
- Coding with Python - It's easy as Pi
- Physical Computing with the Raspberry Pi
- Let's have some fun! Home Automation projects
- For Arduino lovers: WiringPi

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