

HOW TO USE THIS COURSE

Welcome to Intro to Robotics Level A! We are excited to take this journey with you. Please read the following information carefully before starting the course. If you have any questions, please don't hesitate to reach out:

www.42electronics.com/pages/contact-us

OPEN AND GO

This program is written directly to the student and is designed for students (and parents) with no previous electronics or programming experience. Each lesson will walk you through step-by-step to teach you to use common electrical circuit components and common Python commands. Please follow each lesson as written for optimal results.

LEVEL A FLOW

Here's a preview of what you will be learning:

- Working with electrical components to build circuits (Lessons 1-8)
- Working with the Raspberry Pi (Lessons 9, 16-18)
- Writing computer programs in Python (Lessons 10-18)
- Controlling circuits you build with computer programs you write (Lessons 16-18)

Once you have completed Level A, please move onto the next levels:

- Level B: Working with Sensors and Intermediate Programming
- Level C: Incorporating Video and Advanced Programming
- Level D: Working with Motors and Taking It Mobile

SCHEDULING

We recommend scheduling 1-3 sessions weekly for this program. The average lesson is about 45 minutes and we suggest leaving time, especially in later lessons, to practice and explore further using your new skills. The program will take 6-18 weeks to complete depending on how many days a week are scheduled.

PARTS KIT

The parts kit for this course shipped within a few days of your order being placed. Once it arrives, please leave all components in their packaging in the box. This will keep them safe and clean. You'll pull them out as needed for each lesson. Each bag is clearly labeled and each lesson will list which components are needed. A complete list of included parts and pictures, can be found on page 356.

TIP: If you take good care of the components, they will be reusable to build many amazing projects long after you complete this course.

REQUIRED EQUIPMENT

In addition to this curriculum and the Level A parts kit purchased with it, a few pieces of equipment are required to complete this course:

- **Computer Monitor** (a television can also be used provided it has HDMI inputs)
- **HDMI cable** (likely attached to your computer monitor)
- **Keyboard and Mouse**
 - Please use a wired keyboard and mouse if possible. Wireless models do not work reliably with the Raspberry Pi. Visit www.42electronics.com/level-a-resources for a list of inexpensive keyboard and mouse options.
- **Internet access** (wired or wireless)
 - For this level of the course, internet access is only used in Lesson 9 for two purposes:
 - To update the Raspberry Pi's software to the latest versions. This is done as an opportunity to learn an important skill, rather than out of necessity. If internet access is not available, it will not stop you from using this course.
 - To download program files. You will need the files starting in Lesson 16. It is preferable you download them so you can learn to

access the browser and download program files. However, if accessing the internet is not an option, please send us an email support@42electronics.com and we'd be happy to email you the files.

WORKING ON RASPBERRY PI PROJECTS OUTSIDE THIS COURSE

There are many amazing Raspberry Pi projects available on the internet. But before you jump in, we do recommend completing this course first. We want you to have a good foundation in both working with electrical components as well writing code.

It is possible to damage components (including the Raspberry Pi). This course is designed to teach you how to work with the Raspberry Pi and other components safely.

Once you've completed this course, a list of appropriate projects can be found by visiting: www.42electronics.com/level-a-extra-projects.

WHAT'S NEXT?

After completing this course, please move on to Level B of this program available at www.42electronics.com. The next level will continue to build both your electrical and coding skills as well as add fun new components to your tool box.

YOUNGER STUDENTS

We recommend this course for students in middle school and high school (and for adults who want to learn how to work with the Raspberry Pi to do amazing projects). It is possible for a younger student to use this course, but we would recommend the following:

- Work alongside an adult or older child. Remember, this curriculum is designed for people who have no previous experience, so your parents shouldn't be afraid to join you.
- Move quickly through sections that focus on theoretical background and mathematical equations. You can always revisit these sections as you get older.

ACADEMIC CREDIT (HIGH SCHOOL)

For parents wishing this to be a full academic curriculum for a high school student, we would recommend some combination of the following:

- Require written answers for the Questions for Understanding at the end of each lesson (we have included the answers on a separate page to facilitate this).
- Use the additional project suggestions at www.42electronics.com/level-a-extra-projects for practice and skill development.
- Have the student design a circuit and program with the skills they've learned as a final project.
- Complete multiple levels of this course. Scheduled for 2-3 days a week, four levels (plus the additional options below) should take approximately one academic year to complete. Additional levels may be purchased at www.42electronics.com.
- Complete a full Python coding course at www.codecademy.com. This course can be taken for a low monthly fee and generally takes 8-12 hours to complete and is suited for older high school students and adults.
- Have the student read one or more books outlining the historical development of the fields of electronics or computer science, or a biography of a significant contributor to the field and write a report. Excellent choices include Nikola Tesla, Albert Einstein, Ada Lovelace, Charles Babbage, and Alan Turing.

REUSING THE CURRICULUM

This program is non-consumable and both the curriculum and kit are fully reusable for other children in the immediate family. The copyright for this curriculum does not allow it to be sold or given away.