ARDUINO EDUCATION

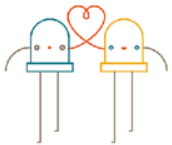
AGENDA

1. INTRODUCTION TO ARDUINO
2. ARDUINO EDUCATION AS PART OF ARDUINO
3. EDUCATION PORTFOLIO
    1. SCIENCE KIT
    2. STARTER KIT
    3. CTC 101
    4. CTC GO!
    5. ENGINEERING KIT
4. ARDUINO CERTIFICATION PROGRAM

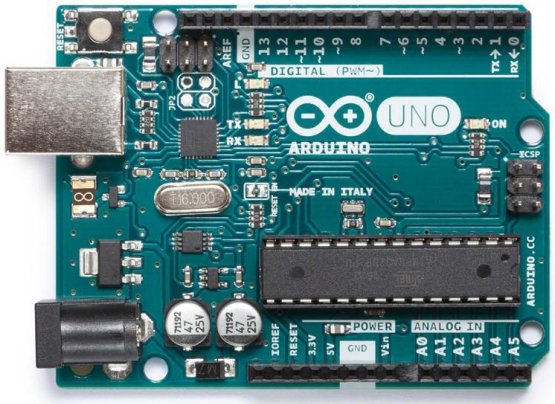
WHAT IS ARDUINO?

ARDUINO
EDUCATION

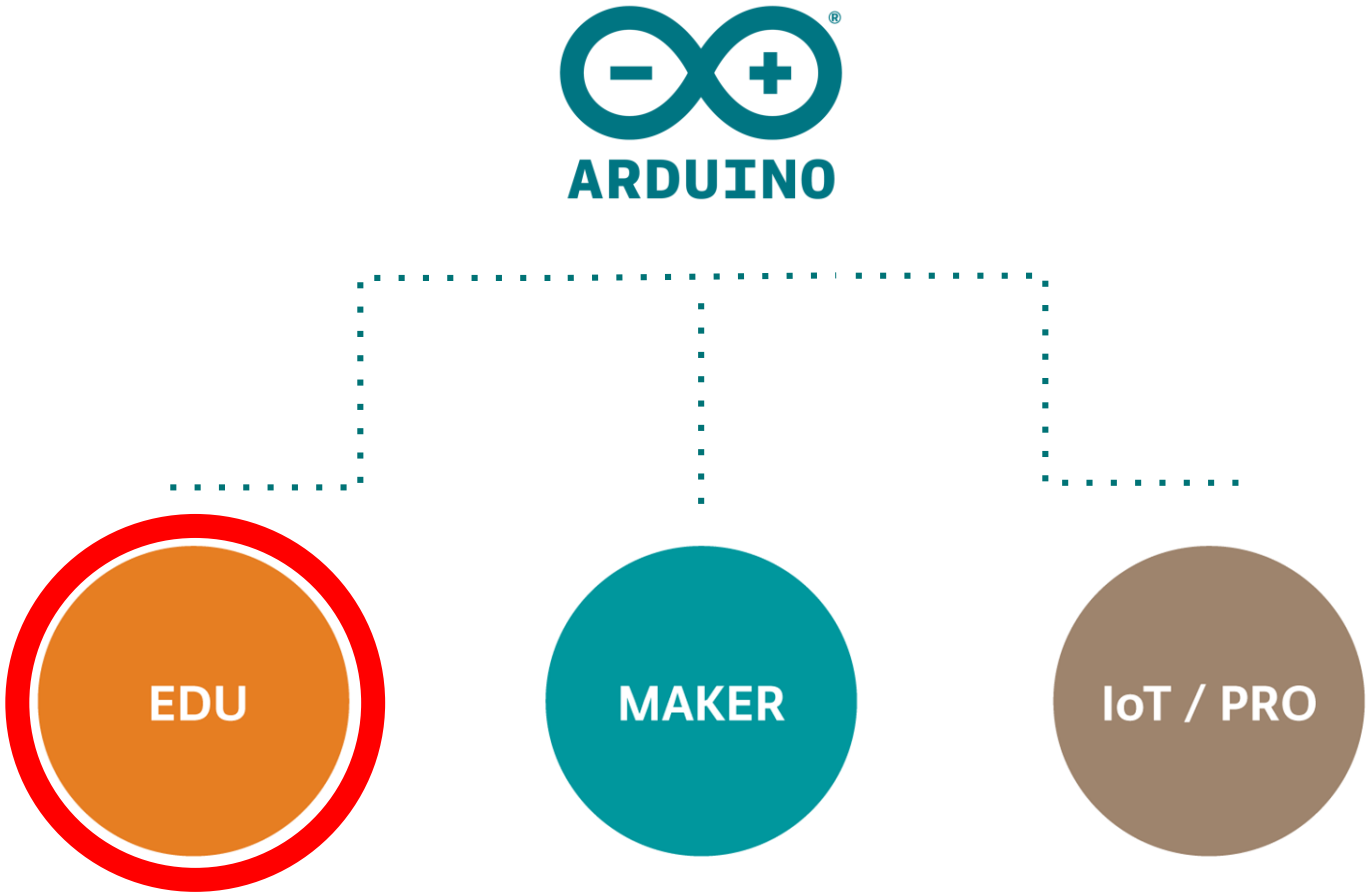
AN **OPEN SOURCE** HARDWARE, SOFTWARE AND CONTENT PLATFORM



MISSION

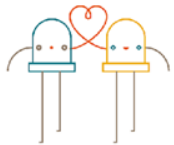


Enabling anyone to innovate by making complex technologies **simple to use.**


ARDUINO
EDU
MAKER
IoT / PRO

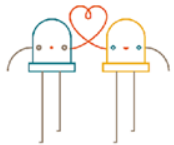
ARDUINO EDUCATION

Dedicated team formed by education experts, content developers, engineers and interaction designers from all around the world to develop the **next generation of STEAM programs** and to **support the needs of teachers and students** throughout the educational journey.

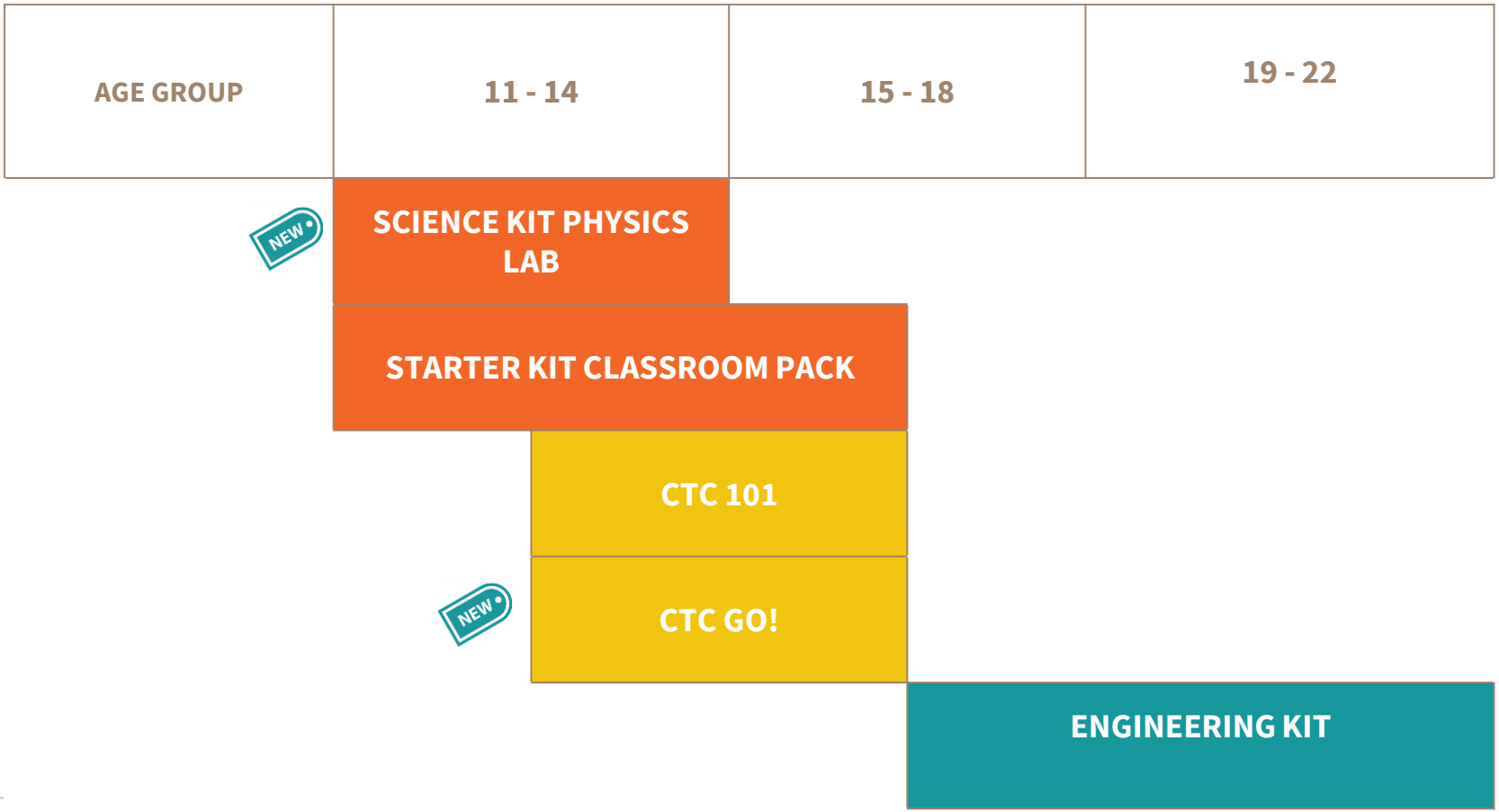


ARDUINO EDUCATION

- **Project based learning**
  Hands-on approach supported by hardware kits for groups and classrooms, e-learning platforms
- **Age range**
  From middle school to college and university
- **Key effort on teachers training and support**
- **Strong partnerships with Mathworks, Google**



ARDUINO EDUCATION PORTFOLIO MAY 2019

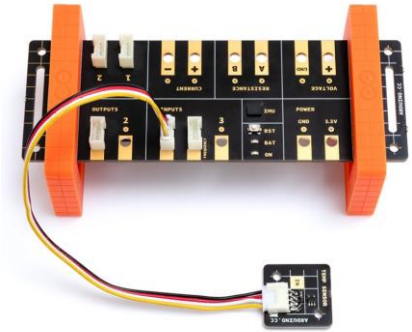


SCIENCE KIT - PHYSICS LAB

The first Arduino Education program designed for **scientific exploration for middle school** teachers and students

SCIENCE KIT - PHYSICS LAB: THE FIRST ARDUINO KIT FOR MIDDLE SCHOOL

NEW



– PROJECT-BASED EDUCATIONAL CONTENT
to run **10 lessons**, aligned with **NGSS** and national **UK Curricula**

– DATA COLLECTION AND ANALYSIS
through the **Google Science Journal App**

WORKS WITH Science Journal an initiative by Google

– EACH TOOLBOX
recommended for **2 students**

– GOOGLE CLASSROOM COMPATIBLE

– DEVELOPED IN PARTNERSHIP WITH:

Google

SCIENCE KIT - CONTENT

– Content on **Arduino Online Platform**, a simple to use platform written by educators for educators and students

– **2 students and 1 teacher** can be registered on the online platform with each toolbox

– The content includes: **9 guided experiments**, teachers lesson plans, getting started guide and worksheets

– **10 Lessons** program in total / Fairground theme

– All aligned with **NGSS**

SCIENCE KIT – ONLINE PLATFORM

ELECTROMAGNETISM & THERMODYNAMICS

ELECTRIC FORTUNE TELLER

Can you guess a shocking fortune? What does your future hold? Let's find out!

BUZZ WIRE MAZE

Steadiest hand wins! Build a conductive 'maze' and then try to avoid the buzzer as you guide the loop around your course!

HAUNTED HOUSE THEREMIN

Did you hear that? Make paranormal sounds with a magnet!

THERMO MAGIC SHOW

It's not magic, it's science! Learn about how different materials conduct or insulate heat.

KINETICS & KINEMATICS

DROP ZONE

Can you slide faster than your friends? Explore gravity and measure the acceleration of your Arduino board.

SPRING RIDER

Make your Arduino board bounce to learn about harmonic motion!

GRAVITRON

Learn about rotations per minute, circular motion, the force required to spin this ride, and the relationship to centrifugal forces.

PIRATE SHIP

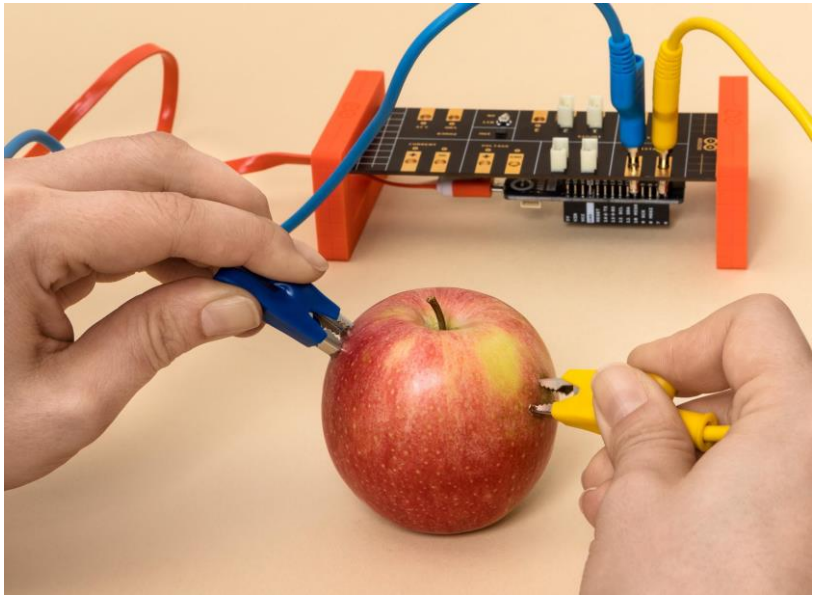
What changes the speed and duration of a swing? Captain the ship and test the oscillation of a pendulum.

CENTRIFUGE

How much energy can you store in a rubber band? Don't get dizzy... Learn about potential energy and motion!

JUMPING INTO EXPERIMENTING RIGHT AWAY

GRAVITY AND ACCELERATION EXPERIMENTS



CONDUCTIVITY EXPERIMENTS

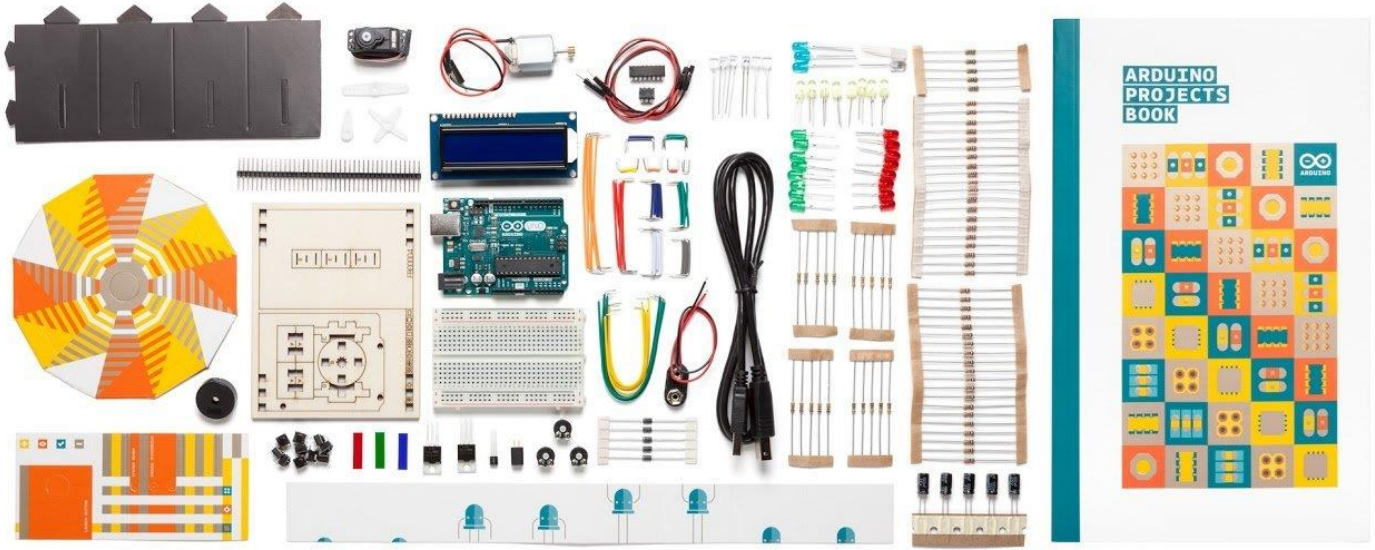
ARDUINO STARTER KIT

Widely used by Educators

STARTER KIT - HANDS-ON LEARNING OF THE PRINCIPLES OF ELECTRONICS AND CODING IN THE CLASSROOM

- 6 x Arduino Starter Kit
- Guide book
- 15 Projects included
- Age range: 11-17

MATERIALS AND BOOK



ARDUINO CTC 101

Creative Technologies in the Classroom 101

is the flagship STEAM Classroom Solution

CTC 101: THE IDEAL ONE STOP-SHOP STEAM EXPERIENCE FOR THE CLASSROOM

– STRONG INTERACTION AMONG STUDENTS
Project Based Learning
Group Collaboration
Cross-curriculum approach

– ONLINE LEARNING CONTENT
with state-of-the-art non linear learning process

– COMPREHENSIVE TRAINING AND SUPPORT
for up to 3 educators from start to end of the program

– AGE RANGE 13-17

WHAT IS INCLUDED

TOOLBOX

26 PROJECTS
AND EXPERIMENTS

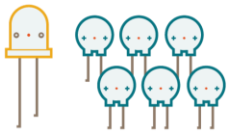
BOARDS, SHIELDS AND
COMPONENTS FOR A CLASS
OF UP TO 30 STUDENTS

ONLINE PLATFORM

ENG/SPA/ITA/CAT
CONTENT

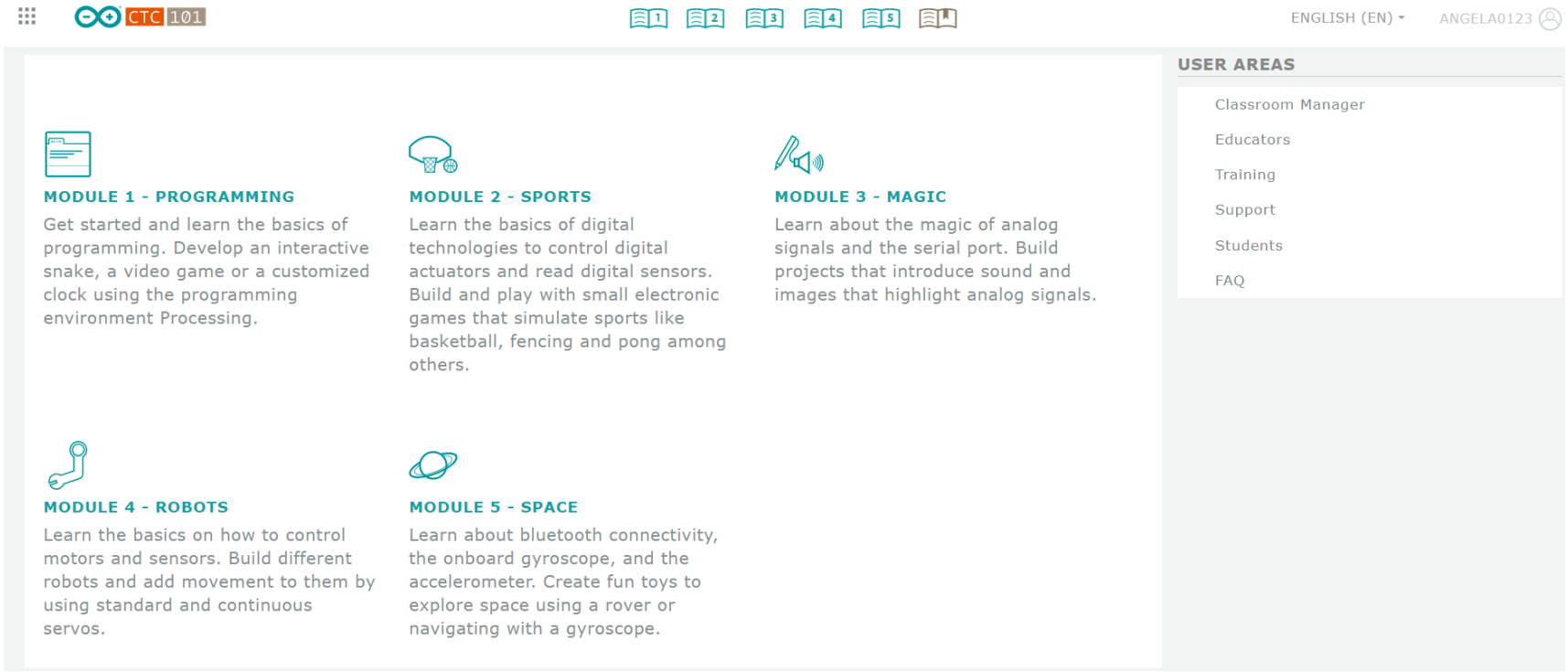
PROJECT BASED
LEARNING

TEACHER SUPPORT & TRAINING



GUIDED EDUCATORS TRAINING, LIVE WEBINARS,
AND MONITORED FORUM BY ARDUINO
EDUCATION EXPERTS

CTC 101 - ONLINE PLATFORM



VALUED BY TEACHERS, ENJOYED BY STUDENTS

3,000+ TEACHERS IN 2018

35,000+ STUDENTS IN 2018

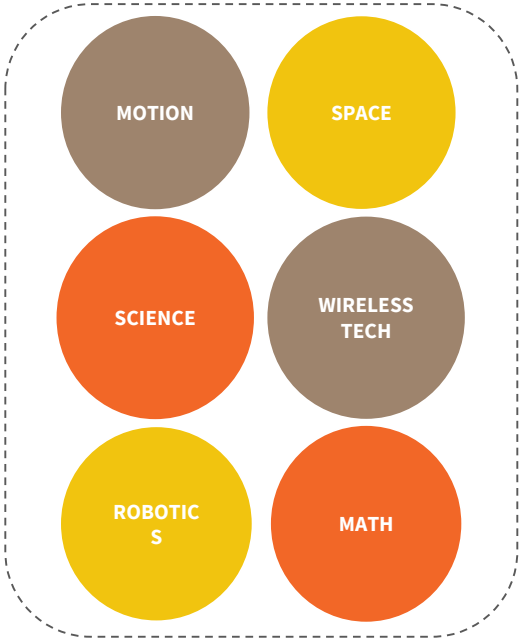
ARDUINO CTC GO!

A modular multi-year STEAM program to teach Creative Technologies in the Classroom

CTC GO!, A MODULAR STEAM PROGRAM WITH ENDLESS POSSIBILITIES

CORE MODULE

+



MULTIPLE EXPANSION PACKS

=

Build and run YOUR OWN STEAM educational journey

CTC GO!, THE FIRST MULTI-YEAR CUSTOMIZABLE ARDUINO EDUCATION STEAM PROGRAM

— CROSS-CURRICULUM EDUCATIONAL CONTENT
to run **20 lessons**, aligned with **NGSS**, national **UK Curricula** and **21st Century skills**

— PREMIUM TRAINING AND SUPPORT
for **up to 3 educators**

— MODULAR ASSEMBLY PIECES
and all the mechanical parts to build the projects

— EACH TOOLBOX IS RECOMMENDED
for **24 students** and **up to 3 teachers**

— BASED ON ARDUINO UNO WIFI REV 2

— COMPATIBLE WITH GOOGLE CLASSROOM

CURRICULUM ALIGNMENT

UK Curriculum

- Computing (K1-K4)
- Design and Technology (K1-K3)
- Information, Media and Technology Skills (K1-K12)

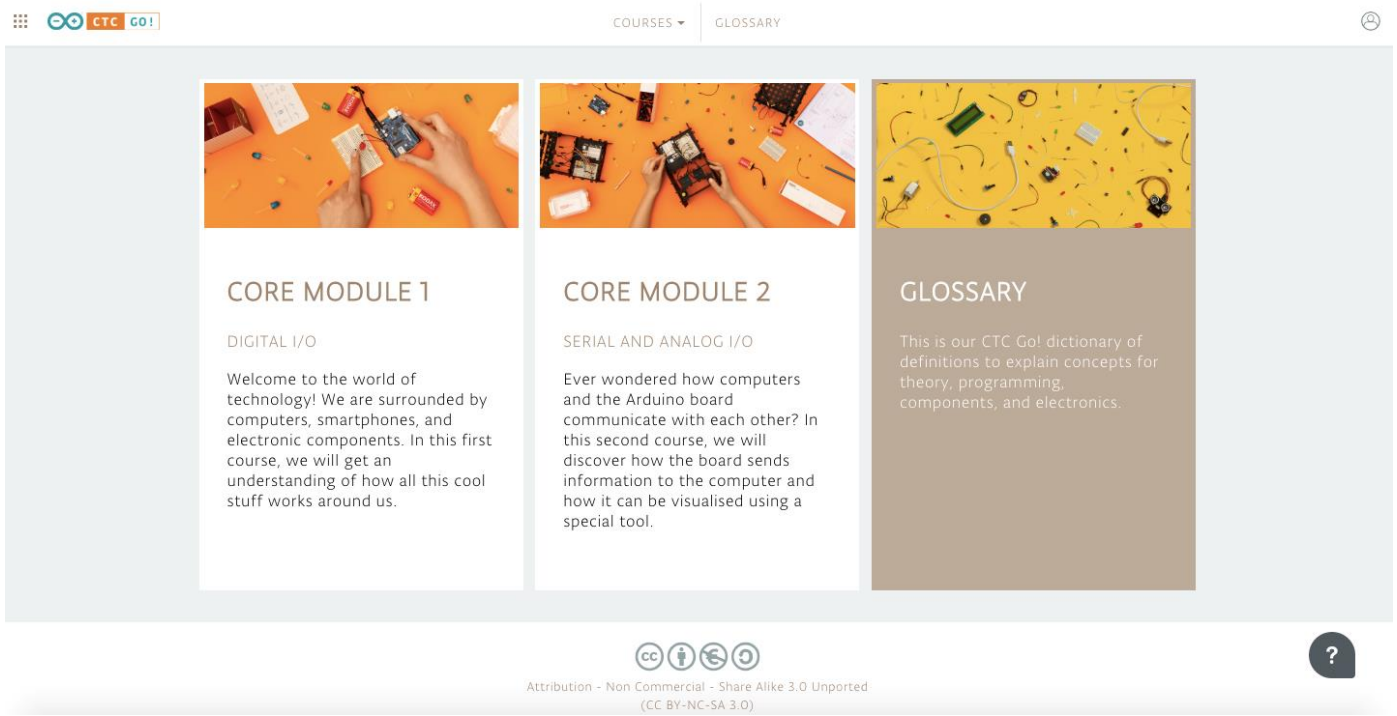
21st Century Skills

- Learning and Innovation Skills
- Life and Career Skills
- Information, Media and Technology Skills

NGSS (Next Generation Science Standards)

- Engineering Design

CTC GO! - ONLINE PLATFORM



ARDUINO ENGINEERING KIT

The first Arduino Education Product for Engineers

ARDUINO ENGINEERING KIT: THE FIRST ARDUINO KIT FOR THE HIGHER EDUCATION COMMUNITY

– INTRO TO CROSS-CURRICULUM CORE ENGINEERING CONCEPTS
based on 3 hands-on projects

– ORIGINAL ONLINE CONTENT
for educators and students

– INTEGRATING MATLAB AND SIMULINK
with Arduino ecosystem

– DEVELOPED IN PARTNERSHIP WITH:

MathWorks®

ENGINEERING KIT - ONLINE PLATFORM

ARDUINO ENGINEERING KIT

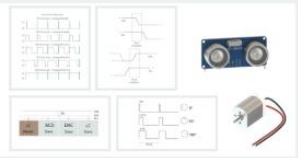
You will be introduced to engineering through a series of practical exercises, resources and theoretical material to easily learn fundamental concepts and key aspects of mechatronics and programming. For it, you will be using Arduino, MATLAB® and Simulink®. The content of this course is divided into six chapters and it has been designed to be followed sequentially from chapters 1 to 3, which should be used as reference when needed. Chapters 4, 5 and 6 are projects, they can be done at any order, but it is recommended to start with chapter 4.

1. INTRODUCTION

Get started with the Arduino Engineering course, get to know the materials included in the kit and the tools you will use to build the projects.

2. GETTING STARTED

Learn the basics for Arduino IDE, MATLAB® user interface, and Simulink® models. Your will discover how these three tools can be connected to each other while making practical exercises.



3. CONCEPTS

Go through a detailed explanation about key engineering concepts such as encoders, I2C communication, PWM signals, and LiPo batteries.

4. DRAWING ROBOT

Build a robot that extracts line traces from an image and program it to reproduce and duplicate the image as a drawing on a whiteboard. You will learn about physics, programming, and robotics.

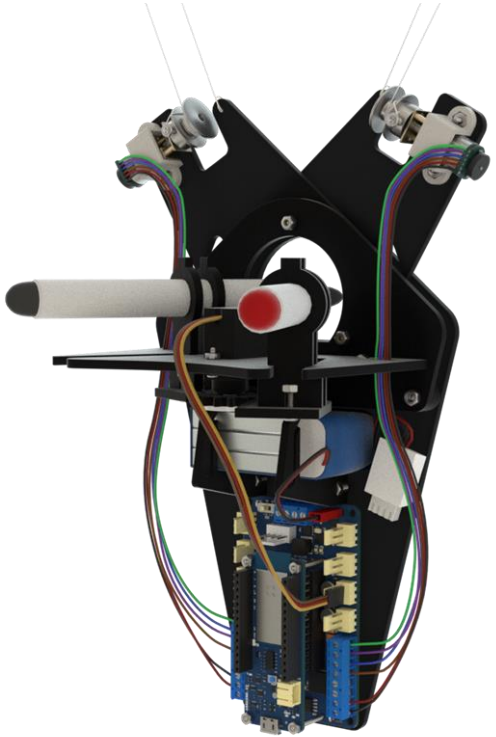
5. MOBILE ROVER

Build and program a mobile rover to follow paths, move objects with a forklift, and avoid obstacles. You will learn about differential drive robots and how to simulate their behavior, control their position or speed, and perform localization.

6. SELF-BALANCING MOTORCYCLE

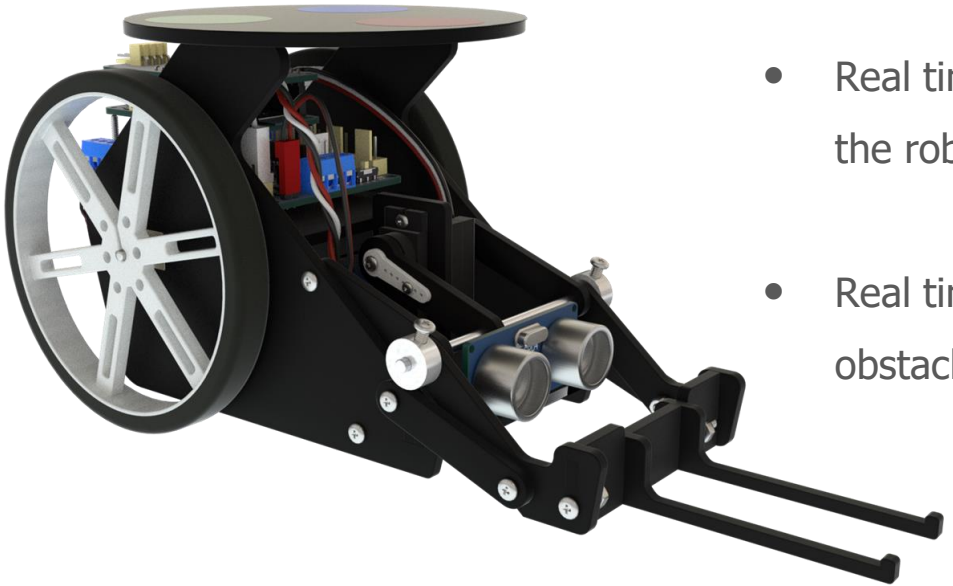
Build and program a motorcycle that self balances and maneuvers by itself on different terrains using a flywheel. You will learn about physics, control algorithms, and how to simulate the vehicle's overall behavior.

DRAWING ROBOT



- Image processing of pictures to take from them the traces to replicate it in a white board
- Trigonometric concepts that allow knowing the position of the robot at the whiteboard
- Mathematical movement concepts to transform the pixels that make up the images in meters that the robot has to move.

MOBILE ROVER



- PID Control concepts in diferencial platforms
- Real time image processing to locate the robot position on the arena
- Real time image processing to detect obstacles

SELF BALANCING MOTORCYCLE

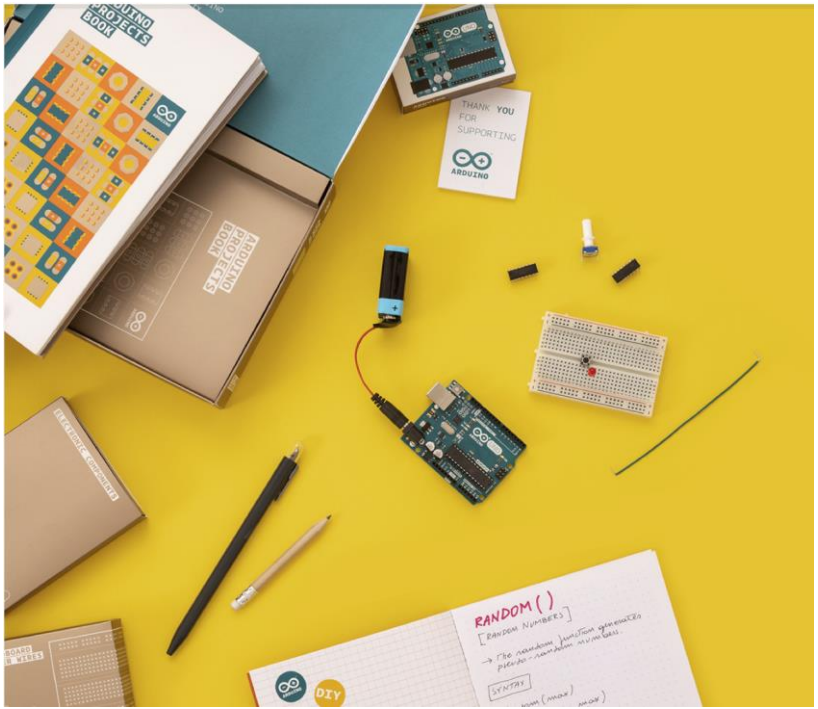
- Apply the mathematical theory in the simulink model
- PID control modeling based on IMU sensor data
- Apply safety measures

In less than one year the **Arduino Engineering Kit** has been chosen and used by **Educators** in more than **130 academic institutions** in more than **60 countries.**

Thank you all!

ARDUINO CERTIFICATION PROGRAM (ACP): AS REQUESTED BY USERS ALL OVER THE WORLD

NEW



– **OFFICIAL CERTIFICATION**
for **enthusiasts, educators,** and **professionals**

– **“FUNDAMENTALS”** is the first module released

– **COVERS THREE MAIN KEY AREAS**
theory and **introduction to Arduino**, **electronics**, and **coding**

– **BASED ON ARDUINO STARTER KIT**

– **MORE INFORMATION ON OUR WEBSITE:**
https://store.arduino.cc/digital/cert_fundamentals

THANKS!

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