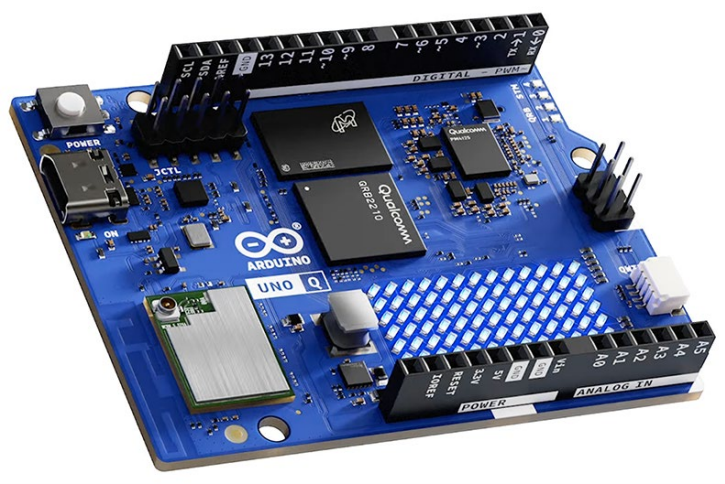
Arduino® UNO ™ Q boards

Making Development Tools Easier for Everyone



Overview

The Arduino UNO Q is powered by Dragonwing QRB2210 System-on-Chip (SoC) / Microprocessor (MPU) paired with a dedicated STM32U585 microcontroller (MCU). The MPU handles high-level computing tasks like AI inference, media control and connectivity, while the MCU enables real-time control for motors, sensors, and low-latency signal processing.

Academic Benefits:

Incorporating Arduino UNO Q into the curriculum equips students with essential skills for modern STEM education. This platform enables hands-on learning by bridging theoretical concepts in electronics, programming, and system design with practical applications. Students gain experience in coding, sensor integration, and data analysis while fostering creativity, problem-solving, and teamwork. Its affordability and versatility make Arduino ideal for project-based learning, encouraging innovation and preparing learners for emerging fields such as IoT, robotics, and automation. By integrating Arduino into coursework, educators can create an engaging, interdisciplinary environment that aligns with industry demands and future technological trends.

Learning outcomes for students using Arduino Uno:

- Understand the fundamentals of microcontrollers and embedded systems.
- Develop basic programming skills using C/C++ in the Arduino IDE.
- Learn how to interface sensors, actuators, and other hardware components.
- Apply concepts of electronics such as voltage, current, and resistance in practical circuits.
- Gain experience in reading and interpreting data from sensors.
- Implement control logic and automation in real-world scenarios.
- Enhance problem-solving and troubleshooting skills through hands-on projects.
- Foster creativity and innovation by designing custom solutions.
- Improve teamwork and communication through collaborative project work.
- Build confidence in prototyping and iterative design processes.

Key Use Cases:

Home Automation

- Control lights, fans, and appliances using sensors and relays.
- Integrate with IoT platforms for remote monitoring and control.

Robotics

- Build simple robots like line-followers or obstacle-avoiding bots.
- Control motors and servos for movement and actuation.

Environmental Monitoring

- Measure temperature, humidity, air quality, or soil moisture.
- Create weather stations or smart garden systems.

Wearable Devices

- Simple fitness trackers or health monitors using sensors.
- Collect and transmit data via Bluetooth® modules.

Curriculum

- Teach programming and electronics basics.
- Demonstrate concepts like PWM, analog/digital signals, and sensor interfacing.

Data Logging

- Record sensor data to an SD card or send it to a cloud service.
- Useful for experiments, agriculture, or industrial monitoring.

Interactive Art & Installations

- Control LEDs, sound, and motion for creative projects.
- Use sensors to make art pieces respond to human interaction.

Prototyping for IoT

- Connect to Wi-Fi or Bluetooth using shields or modules.
- Test ideas before moving to custom hardware.

Reference Links:

- Overview Page
- Online Training
- GitHub

Example Projects:

- Arduino UNO Q Example Applications

Example Curriculum:

- Intro to Arduino – Carnegie Mellon University
- ME588: Mechatronics – Purdue University
- Embedded Systems Using Arduino – UTHM