

Arduino: Programming, Sensors & Motor Control

Learn to program Arduino boards and interface sensors, actuators and communication modules to build embedded systems.

7

MODULES

21

TOPICS

COURSE OVERVIEW

The course is designed to provide participants with a comprehensive understanding of Arduino boards and programming concepts. Participants will learn how to set up the Arduino software (IDE), write code in the Arduino programming language, and interface various sensors and actuators with Arduino boards. The course covers fundamental programming concepts, digital and analog input/output, sensor interfacing, actuator control, communication and networking, and advanced topics such as integrating displays and input devices. Through hands-on projects, participants will gain practical experience in building and programming Arduino-based embedded systems.

WHO THIS COURSE IS FOR

This course is suitable for:

Electronics enthusiasts and hobbyists interested in learning Arduino programming and embedded systems

Engineers or technicians looking to expand their skills in embedded systems development

Students or educators seeking practical knowledge in Arduino programming and prototyping

PREREQUISITES

- Participants should have basic knowledge of electronics and programming concepts.
- Familiarity with C or C++ programming language would be beneficial but not mandatory.

What You Will Learn

By the end of the course, participants will be able to:

- Understand the features and capabilities of different Arduino boards
- Set up and configure the Arduino software (IDE) for programming
- Write and understand Arduino code using the Arduino programming language
- Interface various sensors and actuators with Arduino boards
- Control digital and analog input/output using Arduino
- Implement sensor calibration, filtering, and data processing techniques
- Control motors (DC motors, servo motors, stepper motors) and other actuators
- Establish communication between Arduino and a computer or other devices
- Explore wireless communication options using Bluetooth, Wi-Fi, or RF modules
- Integrate Arduino with online platforms for IoT applications
- Apply advanced Arduino libraries and techniques
- Create projects and prototypes using Arduino for practical applications

COURSE SYLLABUS

7 Modules, 21 Topics

01

Introduction to Arduino

TOPICS

- Overview of Arduino boards and their features
- Arduino Software (IDE) installation and setup
- Introduction to the Arduino programming language

02

Arduino Programming Fundamentals

TOPICS

- Syntax, data types, and variables in Arduino programming
- Control structures (conditionals and loops)
- Functions and libraries in Arduino programming

03

Input and Output (I/O) with Arduino

TOPICS

- Digital input and output (LEDs, buttons, switches)
- Analog input and output (potentiometers, sensors, actuators)
- Pulse Width Modulation (PWM) for analog control

04

Sensor Interfacing

TOPICS

- Interfacing various sensors (temperature, humidity, light, etc.) with Arduino
- Reading and processing sensor data
- Sensor calibration and filtering techniques

05

Actuator Interfacing

TOPICS

- Controlling motors (DC motors, servo motors, stepper motors)
- Working with relays, solenoids, and other actuators
- Implementing motor control algorithms

06

Communication and Networking

TOPICS

- Serial communication between Arduino and a computer
- Wireless communication with Bluetooth, Wi-Fi, or RF modules
- IoT concepts and interfacing Arduino with online platforms

07

Advanced Topics and Projects

TOPICS

- Advanced Arduino libraries and techniques
- Integrating displays (LCD, OLED) and input devices (keypads, touchscreens)
- Project-based learning with Arduino (e.g., home automation, robot control, data logging)

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

FLEXIBLE DELIVERY

Learn the Way That Suits You

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Live Online Classes (ILO)

Fly-Me-A-Trainer (FMAT)

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