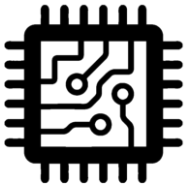
Content of Arduino Basics Course



Content of Arduino Basics Course

🚀 Ready to Dive into Arduino? Welcome Aboard!

Are you Excited to start your journey into the incredible world of electronics, coding, and pure creative magic? You've come to the right place! Our **Arduino Basics Course** is here to make your first steps super smooth, incredibly exciting, and seriously rewarding. Whether you're just curious, or you're itching to build something cool with your own hands, we've got you covered.

💡 Here's What You'll Get:

- **Awesome Video Lessons:** We've packed every single topic from our course outline into easy-to-follow video lessons. No more dry textbooks!
- **Learn Your Way, Anytime:** Once you're in, you've got **lifetime access** to all the materials. So, learn at your own pace, whenever and wherever it suits you.
- **Concepts Made Simple:** Our presentations aren't just engaging; they break down tricky ideas into bite-sized, digestible pieces. You'll stay inspired, not confused!
- **Hands-On Fun:** Get ready to roll up your sleeves! We've got practical assignments that'll help you truly **master what you learn** and prep you for real-world projects.
- **Your Achievement, Certified:** Finish up your final assignment, and you'll earn a **certificate of completion** – a neat way to show off your new skills!

🌟 Why This Course is Your Next Big Step:

Arduino isn't just another tech gadget; it's like a superpower that lets you connect the digital world with the physical. It's truly amazing for sparking creativity in everything from **robotics** and **automation** to **IoT (Internet of Things)** and even **AI**. This course is designed to help you:

- **Grasp the fundamentals** of Arduino and how electronics really work.
- **Build cool, practical projects** – think blinking LEDs, controlling motors, or creating smart systems with sensors.
- **Boost your confidence** in programming with the user-friendly Arduino IDE.
- **Get ready for bigger challenges**, like hooking up Bluetooth, IR sensors, and servo

Content of Arduino Basics Course

Lesson_1

What is Arduino

- Definition and background.
- Open-source advantages.
- Applications (LED, robots, automation, AI, IoT).

Arduino and Other Components

- Basic electronics and sensors .
- Few things we can do with Arduino .

Why You Should Learn Arduino

- Accessibility and Simplicity of Arduino.
- Bridging Hardware and Software.
- Fostering Creativity and Problem-Solving.
- Future Integration with AI and Robotics.

Arduino Boards You Can Find

- Arduino UNO: Features and use.
- Arduino Mega: Features and use.
- Arduino Nano vs UNO.
- Arduino Pro Mini vs UNO.

Lesson_2

Our First Program

- Arduino IDE and Key features .
- Installing IDE.
- Familiar with IDE.
- Arduino program structure: `void setup()` and `void loop()`.
- Example: Blinking LED using pin 13.

Physical setup

- Arduino UNO pinout.
- What is Breadboard .
- Using stimulation softwares.
- Arrange Physical Setup.
- Write first program and more.
- Common mistakes.

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Lesson_3

Basics of Arduino Programming

- `void setup()` and `void loop()` explanation.
- Data types (int, float, char, boolean, string, array).
- Serial Monitor: Display and interaction.
- Arduino functions: `digitalWrite()`, `analogRead()`, etc.
- Delay function and its blocking nature.

Logics in programming

- Conditional statements: `if`, `else`.
- Logic gates: AND, OR, NOT using code examples.

Blinking Two LEDs

- Wiring and code example.

Lesson_4

Knight Rider Project

- Using `for` loops.
- Pattern generation and speed control.

PWM (Pulse Width Modulation)

- LED brightness control using PWM.
- `analogWrite()` usage.
- PWM pin limitation.
- Using RGB leds.

Lesson_5

Serial Monitor – Send & Receive

- Sending and receiving data.
- `Serial.begin()`, `Serial.print()`, etc.
- Difference between `Serial.readString()` and `Serial.read()`.
- Using potentiometer for sensor input(variable resistors).

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Lesson_6

Working with Buttons

- Pushbutton operation and wiring.
- `digitalRead()` and built-in pull-up resistors.
- LED control via button.
- Invert output using NOT gate.

Using Speakers/Buzzers

- `tone()` and `noTone()` functions.
- Continuous tones and siren example.
- Assignment 01: Arduino Piano.

Lesson_7

Controlling Motors with Arduino

- Introduction to Motor driver (L298N).
- Motor Direction control .
- Motor speed control.
- PWM with `analogWrite()`.

Lesson_8

Basic Sensors with Arduino

- Using Joystick with Arduino.
- Using Mic Sensor (MAX9814) with Arduino.
- Using Flame sensor with Arduino.

Lesson_9

Basic Sensors with Arduino

- Using IR sensor with Arduino.
- PIR motion sensor (with security system example).

Lesson_10

Basic Sensors with Arduino

- Introduction to UltraSonic sensor(sonar sensor).
- Messur distances with Ultrasonic sensor (HC-SR04).
- Create LED distance indicating sytem.

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Lesson_11

Using Bluetooth Module

- HC-05/HC-06 with Serial communication.
- Controlling LEDs via phone .

Using Libraries in Arduino

- Manual vs library-based sensor handling.
- Example: `NewPing` vs manual code.

Lesson_12

IR Receiver

- IRremote library setup.
- Function of IR receiver .
- Reading remote control values.
- Controlling LEDs via TV remote.

Lesson_13(Final_Lesson)

Using Servo Motors

- Types of servo motors.
- How to use `Servo.h` library.
- Example: Sweep and Knob.
- Controll servo angel using code.
- Assignment 02: Automatic Trash Can.

Final_Project

Final Project – TV Remote Controlled Car

- Combining IR receiver, motor driver, tone, LED, servo, etc.
- Step by step crate setup .
- Step by step code development .

Congratulations and Contact

- Course completion note.
- Contact info (email, phone).
- Good Bye..