

# RoboSmart Labs

REDEFINING ROBOTICS EDUCATION

## 51 Hour Course - Option 2

Course code: RSL0L51A01



**ADVANCED ROBOTRONICS WITH ARDUINO, EMBEDDED C, 3D DESIGNING AND 3DPRINTING, CODING (HTML-PYTHON-JAVA) /APP – WEB – GAME DEVELOPMENT**  
(ACHIEVER - GOOD FOR GRADE 6-9)



**INTERACTIVE LIVE  
COURSE SERIES**



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## ADVANCE ROBOTRONICS

### Learning Outcome

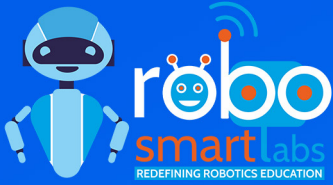
Basic circuit connections: Controlling LEDs and DC motors, Understand the switches, pushbuttons, and battery connections, Control multiple motors with Arduino using scratch programming, Connect the IR sensor and photo-resistor to make an obstacle avoider Robot, Use the Ultrasonic sensor to make a robot and home security system, Use servo motors to make Robotics Arms, Simple project discussion using the integration of multiple sensors, Learning about motors & Learning about sensors

### Projects

Complex LED blinking, Multiple LED interfacing with switch, 4wd robot motor connection, Robot with obstacle detection, Sensor concepts with, Alarm system LDR sensors, Object detection PIR sensors, LDR based Outdoor lighting system, IR sensor based PIR Burglar Alarm

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### EMBEDDED-C ARDUINO

#### Learning Outcome

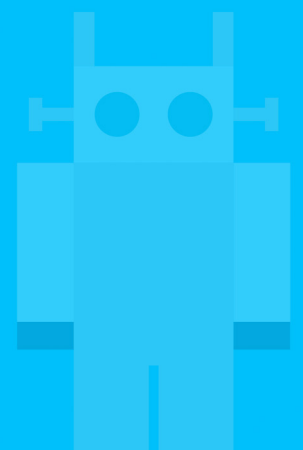
Introduction to programming, Embedded c program, Components of a program, Introduction to Arduino, I/O port, analog pins, digital pins, Parts of Arduino, Circuit making with Arduino, Connect an Arduino and Breadboard, Coding LEDs and DC motors, Coding switches, Pushbuttons, and power supply, Coding multiple motors with Arduino, Coding of Arduino for IR sensor and photo-resistor, Coding Ultrasonic sensor, Coding servo motors

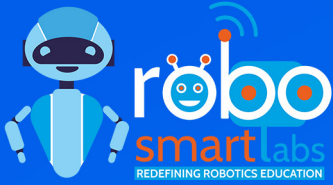
#### Projects

Tiny piano mini breadboard, Automatic room temperature controller, Obstacle avoider robot, Make robotics Arms, Home security system, IR remote toggles 10 leds, Soft servo sweep, Movement servo, Arduino RC robot, Arduino ultrasonic distance sensor

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### ADVANCE APP DEVELOPMENT

#### Learning Outcome

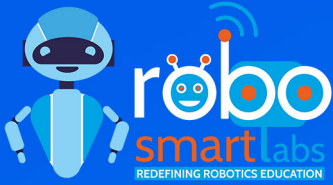
Mobile Android Application development – Java, Software Application, Mobile Application, SDLC, Layout, The App Inventor Environment 2, Designing the Components 3, Adding Behaviours to the Components 8, Packaging the App for Downloading 14, Sharing the App, Adding sound, Images, Videos, Web pages, Speech recognition, Gps sensor, Camera , Accelerometer, Start / stop timer movement, Movement with sensors, Multiple screens

#### Projects

Building Apps with App Inventor, App Inventor and Event-Driven Programming, Fruit Loot: Creating a Simple Animated Game, Multiplication Station: Making Decisions with Code, Beat the Bus: Tracking Location with Maps and Sensors, Tic Tac Toe: Using Loops to Create a Game, Multiplication Station II: Reusing Code with Procedures, Virtual Shades: Drawing and Dragging Images

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## WEB DEVELOPMENT BASIC HTML

### Learning Outcome

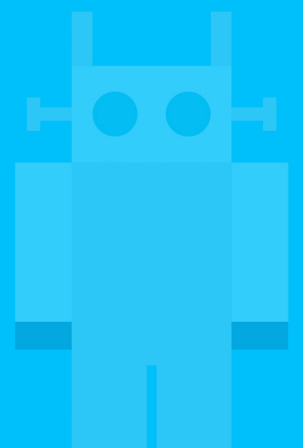
Introduction, Tools of the Trade, Basics of HTML, What is HTML?, Basic Structure of a HTML Page, Doctype, Start and End Tags, The Head Element, The Body Element, Elements within the Head Element, Elements within the Body Element, Elements for Adding Content to the Page, Elements Used in Conjunction with CSS, Elements for Adding JavaScript Code to Website, Elements for Formatting Text, Elements for Defining Sections of a Webpage, Comments, Character Entities

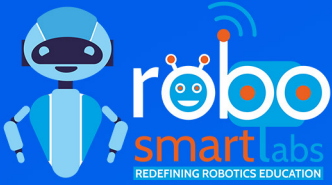
### Projects

Creating HTML files, Opening a .HTML File, Designing a Basic web page, Underlining, Monospace, and Other Text Changes, Specifying Font Sizes, Colors, and Faces, Applying Logical Styles, Designing a advance web page

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BASIC – PYTHON PROGRAMMING (GAME DEV)

## Learning Outcome

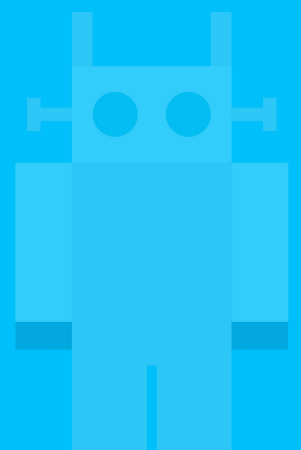
What is coding?, Meet Python, Installing Python, Using IDLE, Your first program, Variables  
Making decisions, Loopy loops, Animal Quiz, Functions, Fixing bugs, Modules

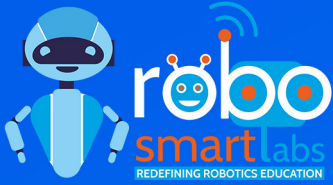
## Projects

Password Picker, Nine Lives, Turtle Graphics, Robot Builder, Kaleido-spiral, Starry Night, Mutant Rainbow, Playful Apps, Countdown Calendar, Ask the Expert, Secret Messages, Screen Pet, Games in Python, Caterpillar, Snap, Matchmaker, Egg Catcher

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## 3D PRINTING AND DESIGNING

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What is 3D printing?, History of 3D printing, Discovery of Stereolithography, The RepRap Project, The use of 3D printing, 3D Printing Technologies, FFF 3D printers components, SLA – stereolithography, Choosing a 3D printer, Choosing the right printing material, Slicing software, Preparing the print surface – start print and Post-processing, Filaments selection supports. Multi-colour 3D printing

### Projects

Getting a 3D model, Online libraries and 3D hubs, 3D modelling software, Modelling 20 different shapes in Tinkercad, Various tools using in tinker cad, Introduction to Autodesk Fusion 360, Project transferring to Slicing software, Project file exporting to printer, 3d printing – Gluing and smoothing models using acetone

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