MOONPRENEUR
Future-proofing the Next Generation

Tier-2 Robotics

Session No	Course Contents
Session 1	**Circuits, Action!Lights,** Become a Circuit Builder! Learn how to use breadboards to wire up real circuits, understand the secrets of electricity (current, voltage), and build a motion-activated detector.
Session 2	**Blocks vs. Text: Discovering the Power of text coding** Transition from blocks to real Python code! Master fundamental programming syntax (loops, indentation) and start writing professional text-based programs to control devices.
Session 3	**Light Detection** Code a Smart Device! Learn the power of "if-then" logic (conditional statements) by programming a light sensor to make decisions, creating devices that react intelligently to their environment.
Session 4	**Code Smart With Variables** Master Variables to unlock efficient coding! Discover how to store and change values , making your LED projects dynamic and easily customizable without rewriting the entire program.
Session 5	**Tap & Track : Counter** Build a fundamental programming elements to real-world tracking toolsDigital Counter! Use coding logic to track button presses, set limits, and create a functional counting device, connecting .
Session 6	**Getting started with Raspberry Pi Pico:- WOKWI** Kickstart your journey with the Raspberry Pi Pico! Learn to write and run MicroPython code, gaining the essential skills needed for embedded systems and future electronics projects.
Session 7	**Interfacing of Slide Switch** Control your circuits with inputs! Interface a slide switch to your microcontroller and write simple logic to turn lights and devices ON and OFF

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Session 8	**Understanding the digital inputs** Decode Digital Logic! Learn how to combine multiple switch inputs using AND/OR logic to create advanced decision-making systems for your projects.
Session 9	**RGB LED with Raspberry Pi Pico** Mix Lights, Program the RGB LED using conditional logic and digital inputs to generate any color you want, adding lighting effects to your inventions.
Session 10	**Melody Maker** Learn how buzzers generate sound, understand musical notes and frequencies, and code your own simple melodies and jingles.Show and Tell! Present your creative Micro:bit project to the group and get feedback.
Session 11	**Show n Tell Event 1** Present your first set of coding creations to friends and family, celebrate your progress, and practice pitching your work.
Session 12	**Lighting Up Seven Segment DisplayMicro:bit Upload Magic** Build a Digital Number Display! Learn the inner workings of a seven-segment display and program it to show numbers, the building block of digital clocks and scoreboards.
Session 13	**Introduction to Arduino Lab** Get set up for success! Learn how to install and use the Arduino Lab environment to start programming your Raspberry Pi Pico in MicroPython efficiently.
Session 14	**ELBV3 Kit Unboxing, Code, Connect, Illuminate on Embedded Learner Board** Unbox and Power Up! Get familiar with all your new hardware components (ELBV3 Kit) and Upload your very first code to control the lights on your Embedded Learner Board.

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Session 15	**Interfacing of Potentiometer** Add Analog Control to your projects! Learn to interface a potentiometer (a rotary dial), read its analog values, and use it to precisely control light brightness or speed.
Session 16	**Potentiometer Palette: Mix Your Mood Light** Build an Interactive Mood Light! Use the potentiometer dial to mix colors in real-time, learning how to map analog input data to control complex RGB outputs.
Session 17	**NeoPixel LED Adventure** Dive into Smart LEDs! Understand how NeoPixels work, learn to control colorful LED rings, and use Python lists to manage complex lighting patterns.
Session 18	**NeoPixel LED Adventure** Unlock advanced Python structures! Use Dictionaries (Key-Value Pairs) to efficiently control intricate NeoPixel matrix displays and create complex, dynamic lighting effects.
Session 19	**Interfacing of OLED with Pi Pico** Give your project a screen! Learn to interface and use the OLED display, understanding the I2C communication protocol to show text, numbers, and graphics.
Session 20	**Smart Sensing with LDR & OLED Displays** Build a Smart Dashboard! Use the LDR (Light Dependent Resistor) to measure ambient light and display the real-time data onto your OLED screen.
Session 21	**Smart Entrance-Exit System** Create a Proximity Sensor System! Understand how IR (Infrared) sensors detect presence and build a simple application for counting or security.
Session 22	**Twist & Tune** Master Sound and Speed! Learn about PWM (Pulse Width Modulation) frequency and use the potentiometer to twist and tune the pitch of sounds or the speed of devices.

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Session 23	**Show n Tell Event 2** Project Presentation Day! Showcase your completed embedded projects using sensors and displays (ELB V3) to demonstrate your growing technical expertise.
Session 24	**Exploring Keypad Input with ELB - V3** Build a Personalized Access System! Learn to read complex input from a 4x4 keypad, which is the core component for building password entry and smart lock devices.
Session 25	**Password-Protected Locking System** Add Movement and Security! Learn how Servo Motors work to control precise movement and integrate them to build a functional, password-protected locking mechanism.
Session 26	**SorObstacle Detection using Ultrasonic Sen** Give your robot Eyes! Master the Ultrasonic Sensor (sonar) to measure distances accurately and program your project to sense obstacles in its path**.**
Session 27	**Circuit Guardians: Breadboards & Motion Detectives** Become a Motion Detection Expert! Review circuit fundamentals and integrate a motion sensor to create an alarm or automated system.
Session 28	**Temprature sensor** Build a Smart Thermometer! Learn how temperature sensors work, measure the environment, display the data, and program your device to take actions based on temperature changes.Give your robot Eyes! Master the Ultrasonic Sensor (sonar) to measure distances accurately and program your project to sense obstacles in its path**.**
Session 29	**IR remote-I** Take Remote Control! Learn the secret codes of an IR remote and program your microcontroller to recognize and respond to different button presses.
Session 30	**IR remote - II** Build a fully functional IR Remote Application! Use the skills from the previous session to control lights, motors, or other features wirelessly.

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Session 31	**Joystick - I** Game On! Learn the analog and digital inputs of a joystick and understand how to translate physical movement into code commands.
Session 32	**Joystick -II** Create a Joystick-Controlled Project! Build an application where you can steer a device or control an interface using the joystick.
Session 33	**Speedy LEDs: Button-Powered Chase** Control the Speed of Light! Learn how to use button inputs to dynamically change the speed and timing of an LED chasing effect.
Session 34	**Knight Rider LED Chasing Effect** Code the classic Knight Rider light pattern! Master the for loop to create smooth, repetitive, and visually engaging LED sequences.
Session 35	**Show n Tell-3** Final Project Showcase! Present a fully functional, integrated product demo using multiple sensors and display devices (ELB V3) and practice pitching your innovation.
Session 36	**Unbox, Assemble, and Explore: The Moonkart Robotic Car Kit** Build a Robot Car! Unbox your kit, identify the components, and get familiar with the Pico UNO Board—the brain of your new robotic vehicle.
Session 37	**The Motor Mechanics: Understanding DC motors** Learn the Power of Motors! Understand how DC motors work and how to safely control their direction and speed to move your robot.
Session 38	**Robot Movements Forward and Backward** First Drive! Program the fundamental movements of your robot car, getting it to move forward and backward with precision.
Session 39	**Understanding the I2C LCD Display** Give your robot a voice! Learn to interface the I2C LCD screen and program it to display real-time status or data from your robot's sensors.

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Session 40	**Limit Switch** Stop the Crash! Discover Limit Switches, simple collision detectors, and program your robot to stop or change direction when it bumps into something.
Session 41	**Understanding the IR Sensor** Give your robot a voice! Learn to interface the I2C LCD screen and program it to display real-time status or data from your robot's sensors.
Session 42	**Navigating with Sensor** 360° Vision! Mount the ultrasonic sensor on a servo motor to give your robot a wide field of view, allowing it to scan the environment and measure distances in all directions.
Session 43	**Obstacle Avoiding Robot with Decision-Making Algorithm** Build a truly Autonomous Robot! Program complex decision-making algorithms that allow your robot to process sensor data and independently navigate around obstacles.
Session 44	**Building a Robot with an Accelerometer** Add Motion Sensing! Integrate an accelerometer to measure tilt, acceleration, and orientation, opening the door for gesture-controlled or self-balancing robot projects.
Session 45	**Introduction to IR Array** Begin building a Line Follower! Understand the array of IR sensors used to "see" the line and learn the initial concepts of motor control required for accurate tracking.
Session 46	**Line Follower Robot - I** Refine and Improve! Continue coding your line follower, adding complexity and logic to handle curves and intersections for a smoother, more accurate tracking performance.

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Session 47	**Line Follower Robot - II** FinTune-Up! Complete your line-following robot. Learn advanced troubleshooting techniques and optimization skills to ensure your robot can flawlessly follow lines in any scenario.al
Session 48	**RF-Based Remote Controlled Robot** Build a Wireless RC Robot! Understand the principles of RF (Radio Frequency) communication and learn how to pair a remote control to your robot for complete wireless command.
Session 49	**File Handling** Master Data Logging! Learn the critical skill of reading data (like remote commands) and storing it securely in a CSV file using Python for later analysis or configuration.
Session 50	**Reading CSV File** Learn how to Read and Use Stored Data! Practice reading data back from the CSV files you created, which is essential for loading configurations or analyzing logged information.
Session 51	**Final Showcase** The Grand Finale! Synthesize all your skills into a themed, self-designed project, build it, and deliver an impressive pitch demonstrating your complete journey.
Session 52	**Show n Tell Event 4** Final Presentation of all robotics and coding knowledge gained, showcasing your best work to celebrate your mastery.

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