



Tier-1 Robotics

Session No	Course Contents
Session 1	Kickstart: Zoom and MicroPython Get started with Zoom and the Micro:bit Python Editor! Learn how to set up your coding environment and explore the basics of MicroPython programming.
Session 2	Micro:bit Fundamentals: Text, Images, and Delays Dive into essential MicroPython commands and understand how to display images and text on the Micro:bit.
Session 3	Button Logic: Using If Statements in MicroPython Learn how to use Micro:bit's buttons with if statements and create interactive responses!
Session 4	Variables Explore variables and understand how to store and manipulate data in MicroPython.
Session 5	Operators Discover mathematical operators and how to perform calculations in your MicroPython programs.
Session 6	Random Numbers Learn how the accelerometer works and create fun gesture-based games using the random module!
Session 7	Comparison Operators Take accelerometer gestures further and explore more exciting possibilities!
Session 8	Roll the Dice Master control flow with if, elif, and else statements to make smarter programs.

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Session 9	Show and Tell Mock Practice session – refine your projects and prepare for a fun Show and Tell!
Session 10	Show n Tell Event 1 Show and Tell! Present your creative Micro:bit project to the group and get feedback.
Session 11	Kit Unboxing and Uploading the First Code to the Micro:bit Unbox the Moontinker kit
Session 12	Micro:bit Upload Magic View the results of uploading the original code to the actual Microbit.
Session 13	Dance animation on microbit Create custom animations using the Micro:bit LED matrix and bring your ideas to life.
Session 14	Calculate and Display Math Operations using Microbit Work with strings and display scrolling messages on your Micro:bit.
Session 15	Functions Introduction to functions—learn how to write reusable and efficient code!
Session 16	Functions with return value Enhance your coding skills with functions that accept parameters and return values.
Session 17	Understanding Light Sensors with Micro:bit Explore the Micro:bit's light sensor and create interactive brightness-based projects.
Session 18	Playing with Logic: Dice Games with AND/OR Logic Learn about logical operators (AND, OR) and use them in smart decision-making programs.
Session 19	Micro:bit Challenge: Skills Booster Revision session—review what you've learned so far and strengthen your concepts!

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Session 20	Pixel by Pixel: Exploring Patterns on Micro:bit Learn about LED matrix coordinates and how to control individual pixels. (Part I)
Session 21	Show n Tell Event 2 Show and Tell! Demonstrate your creative LED matrix project.
Session 22	Optimize and Glow: Efficient LED Control Optimize your LED matrix animations and enhance your coding efficiency
Session 23	Catch me If you can! Get introduced to the Micro:bit breakout board and explore new possibilities!
Session 24	Bright Blinks: Understanding LED Circuitry Learn how to control digital output, like turning LEDs ON and OFF
Session 25	Introduction to RGB LED Take digital output further with exciting real-world applications!
Session 26	RGB Brightness Control Understand analog output and control RGB LED brightness smoothly with buttons.
Session 27	RGB Brightness Control -2 Optimise the code for analog output and control RGB LED brightness smoothly with buttons.
Session 28	Working with Digital Input Part I Real life applications with Motion sensor to control light, learn about digital input and control digital output.
Session 29	Potentiometer as an Input Controlling the brightness of light with potentiometer and creating dimmer circuit!
Session 30	Working with Servo Motor Learn how to translate the potentiometer's position into specific servo motor angles, allowing for accurate and controlled movement.

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Session 31	<p>Show n Tell Event 3</p> <p>Share your latest coding creations and inspire your peers with your interactive projects.</p>
Session 32	<p>Smart Garage Door</p> <p>Create a prototype garage door project using a PIR sensor and a Geekservo motor, and integrate these sensors into a Lego-based structure..</p>
Session 33	<p>Pedestrian Crosswalk</p> <p>Create a pedestrian crosswalk prototype using a 4-digit seven-segment display, RGB LED, all integrated into a Lego structure.</p>
Session 34	<p>Automated Fan Speed Control</p> <p>Explore the working of a motor and its speed control through programming. Create a project using a potentiometer, fan motor module, micro:bit, and integrate everything into a Lego structure to make it resemble a real-life fan project.</p>
Session 35	<p>Automated Fan Speed Control – II</p> <p>Integrate a Geekservo to convert the simple fan project into an auto-swing fan. Learn the programming required for this new project.</p>
Session 36	<p>Automated Fan Speed Control – III</p> <p>Take sensor-based projects to the next level with deeper programming and real-world applications.</p>
Session 37	<p>Introduction to Moonrover Kit</p> <p>Unbox the Moonrover kit and explore its components. Test core functionalities like LEDs, NeoPixels, motors, and other basic modules to ensure everything works before diving into building projects.</p>
Session 38	<p>Understand, Feel and Experience</p> <p>Explore how robots communicate using I2C, a special way devices talk to each other. We'll learn about unique addresses for each device.</p>

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Session 39	<p>Moonrover Navigation</p> <p>Dive into the science of sound! Understand the physics behind sound waves, especially ultrasonic sound — how it works, and why humans can't hear it. Then, apply this knowledge to measure distances using an ultrasonic sensor with Micro:bit.</p>
Session 40	<p>Sound and Sensors</p> <p>Discover how to measure distances with ultrasonic sensors. We'll code the sensor to detect how far away obstacles are and display the distance on the Micro:bit.</p>
Session 41	<p>Ultrasonic Distance Sensing</p> <p>Take your robot's driving skills to the next level! We'll program it to automatically stop or reverse when it sees an obstacle and even turn to avoid it. Watch your Moonrover navigate a challenging course without bumping into anything!</p>
Session 42	<p>Radio Communication</p> <p>Learn how radio waves differ from sound waves and how Micro:bits use radio functionality to communicate wirelessly. Set up a basic radio communication channel between devices to send and receive messages, paving the way for collaborative or remote-controlled robotics.</p>
Session 43	<p>Messages over the Radio Communication</p> <p>Build on your knowledge of radio functionality by creating a project where one Micro:bit sends a message and another responds. Learn how to sense, receive, and process messages wirelessly—laying the foundation for multi-Micro:bit interaction.</p>
Session 44	<p>Rock, Paper, Scissors Game – Part I</p> <p>Begin building a Rock–Paper–Scissors game using two Micro:bits. In this session, implement player role assignment and radio setup for two-way communication.</p>

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+1(855) 550-0571



moonpreneur.com



inquiry@moonpreneur.com



Session 45	Rock, Paper, Scissors Game – Part II Generate random moves using MicroPython and display them on the Micro:bit. Use radio to send the move to the opponent.
Session 46	Rock, Paper, Scissors Game – Part III Add logic to decide the winner based on both players' moves. Include result display, sound effects, and reset functionality for replay.
Session 47	Moonrover Control With Radio Control your Moonrover using radio signals, allowing for remote operations and inter-device communication.
Session 48	IR Sensor Line Following: Part I Program your Moonrover to follow a line! We'll code it to turn based on what the IR sensors detect. Your robot will follow a path and even give you visual cues with NeoPixels when it turns.
Session 49	IR Sensor Line Following: Part II Fine-tune your line-following robot! We'll customize the code to make it work perfectly in different environments and test it in various scenarios.
Session 50	Final Showcase Part 1 It's showcase time! You'll present your amazing Smart Delivery projects. Plus, we'll have a fun race competition.
Session 51	Final Showcase Part 2 Put all your skills together for a themed project: a "package delivery" mission! Your Moonrover will follow a line to a "house" and avoid obstacles along the way. Or Showcase your own project.
Session 52	Show and Tell Another opportunity to share your projects and celebrate your achievements!

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