

SCINNOVA  
**VIII**

# AUTOMATON



**STUDY GUIDE**

Dive into the world of robotics and automotive innovation, where your creativity, programming prowess, and critical thinking will be pushed to their limits. Carefully study the details provided, conduct thorough research, and ensure a strong command of C++ programming to excel in this challenge.

## Round 1:

A new test awaits, where motion and control meet innovation. As engineers of the future, you will craft a machine to dominate the arena, blending the precision of mechanics with the intuition of control. Guided by unseen commands, this creation will require skills akin to those of a driver—balancing finesse and strategy to outmaneuver competitors. With structures forged from materials provided, your invention must prove resilient and agile, navigating a space where every move matters. Victory lies in the hands of those who can think on their feet and command their creations with unmatched precision.

## Round 2:

Descending from the skies, a marvel of engineering beckons—a challenge where ingenuity, precision, and timing converge. Participants will need to combine the artistry of design with the precision of programming, using tools that bridge the gap between the tangible and the coded. Mastery of systems, fluent communication with microcontrollers, and the elegance of logic in C++ will shape the path to success. In this endeavor, only those who can harmonize creativity and real-world application will see their creation soar and land with perfection.

## The content we expect you to know:

### Arduino IDE:

The gateway to programming your microcontroller, this intuitive platform allows you to write, compile, and upload code effortlessly. With its user-friendly interface and robust functionality, it serves as the essential tool for bringing your Arduino-powered creations to life.

Download the software on your laptops and bring it on the day of round 1 and round 2

<https://www.arduino.cc/en/software>

Also install ESP 8266 libraries on your laptop

<https://www.youtube.com/watch?v=OC9wYhv6juM>

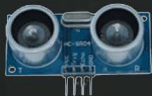
## Arduino Uno/ Nano:

The brain behind your designs, a microcontroller that bridges hardware and software, allowing you to bring ideas to life. Precision and logic are key when programming this versatile device.



## Ultra Sonic Sensor:

With the ability to perceive distance through sound, this sensor serves as the "eyes" of your creation, enabling it to respond to its surroundings with accuracy.



## Servo Motors:

Compact yet powerful, these motors provide controlled motion, essential for tasks requiring precision and adaptability.



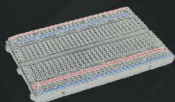
## Keypad module:

A versatile input device that allows users to interact with their designs by entering commands, numbers, or codes. With its grid-like structure, it integrates seamlessly into your project, offering precision and reliability for various control applications.



## Bread Board:

A versatile platform for prototyping, allowing you to build and test circuits without soldering. With its grid-like structure, it provides an organized way to experiment and refine your designs effortlessly.



## Node Mcu:

A microcontroller with Wi-Fi capabilities, enabling seamless communication between your creation and external devices. Perfect for smart, connected designs.



## L298N Motor Driver:

The powerhouse of mobility, this module ensures your motors receive the correct power and control signals, translating your commands into motion.



## Gear Motors:

Designed for torque and efficiency, these motors bring life to your moving designs, driving them forward with strength and reliability.



## Joy Stick Module:

A dynamic input device that captures directional movement and button presses, enabling intuitive control over your designs. Whether navigating, steering, or adjusting, the joystick module provides smooth, responsive interaction for real-time applications.



## LCD Module:

A compact display module used to present information visually, from text to numerical data. Perfect for adding a user-friendly interface to your designs, it ensures clarity and real-time feedback.



## Tinker Cad:

A beginner-friendly online platform for designing and simulating circuits and 3D models. With its intuitive drag-and-drop interface, Tinkercad allows you to prototype and visualize your ideas virtually, making it an excellent tool for experimentation and learning, allowing you to write complex code in C++ using blocks.

## **Batteries:**

The powerhouse of your creation, providing the essential energy needed to fuel your circuits and components. Reliable and portable, they ensure your design operates smoothly, whether stationary or in motion.

## **Wires:**

The lifelines of your circuit, connecting components and ensuring seamless communication between them. These flexible conduits carry power and signals, bringing your design to life with precision and efficiency.



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