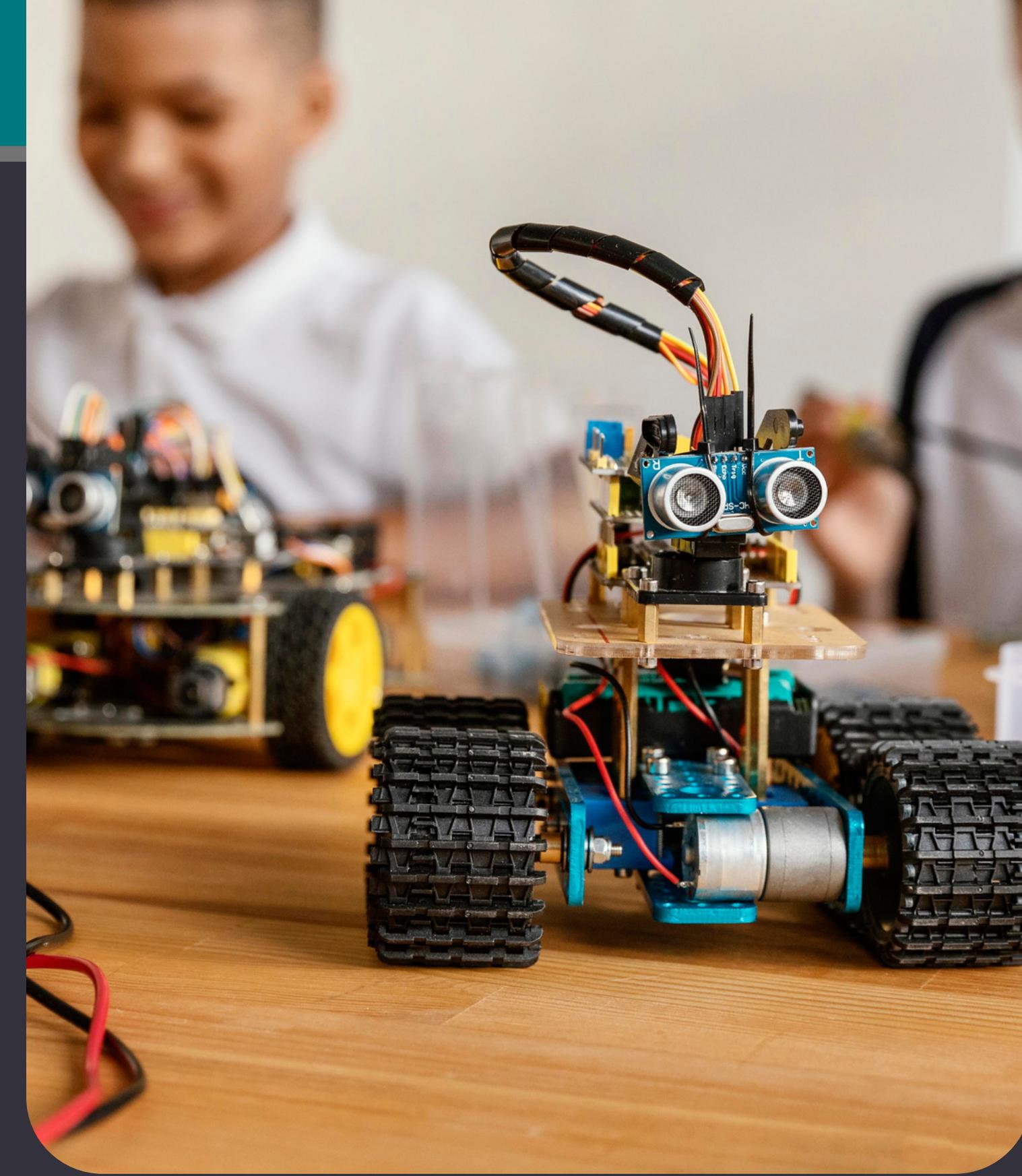


PROPOSAL

# AICRA CERTIFIED ROBOTICS LAB

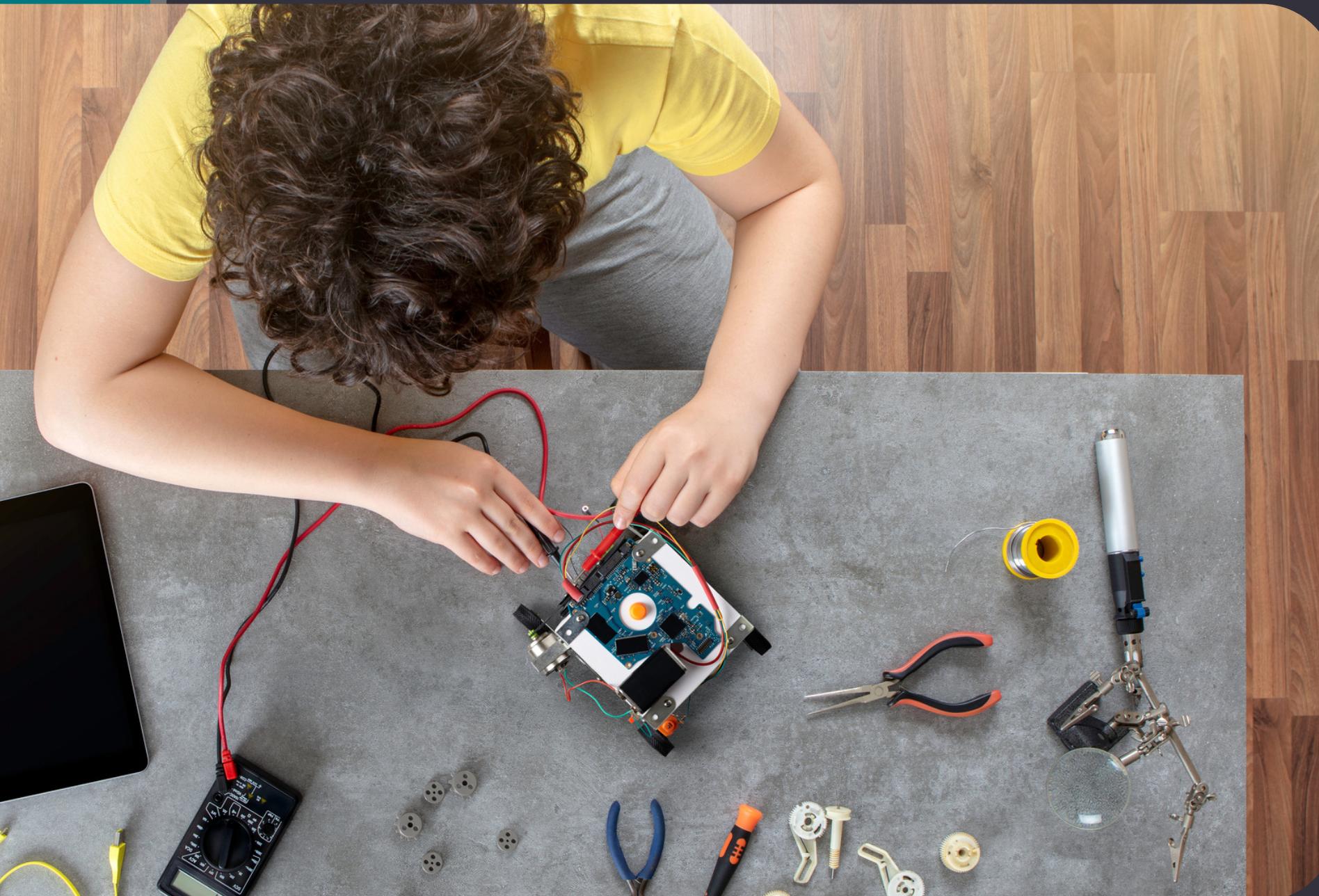


@technoxoan9ja

09160605054, 09156444478

[www.technoxiannigeria.com](http://www.technoxiannigeria.com)

[info@technoxiannigeria.ng](mailto:info@technoxiannigeria.ng)



## THOUGHT PROCESS

# Science, Technology and Innovation

“My message, especially to young people is to have courage to think differently, courage to invent, to travel the unexplored path, courage to discover the impossible and to conquer the problems and succeed.”

Abul Kalam Azad  
Scientist and honorable President of India



IN PROCESS OF DEVELOPING ROBOTICS SOCIETY

# Introduction

Abira Automation (P) Ltd, is a leading company in techno supplies and services. Our portfolio is:

- National Coordinator of “All India Council for Robotics & Automation (AICRA)”
- Leading online/offline education service provider in higher education via its flagship portal [abiraworld.com](http://abiraworld.com) , having 29 channel partners ( AP) in different parts of the country.
- Organizer of world’s largest robotics championship “**TechnoXian**”.
- Organizer of National Student Space Challenge at IIT Kharagpur.
- Organizer of National Robotics Competition [www.robofiesta.com](http://www.robofiesta.com) in affiliation with IIT Gandhinagar.
- Organizer and responsible for selection procedure of “**IndiaSkills Competitions**” with UP government. Selected teams would represent India in WorldSkill competitions.
- Leading supplier of robotics and electronics equipment via India’s leading commerce portal [www.robohaat.com](http://www.robohaat.com)
- Certified Vendor at ‘GEM’ .

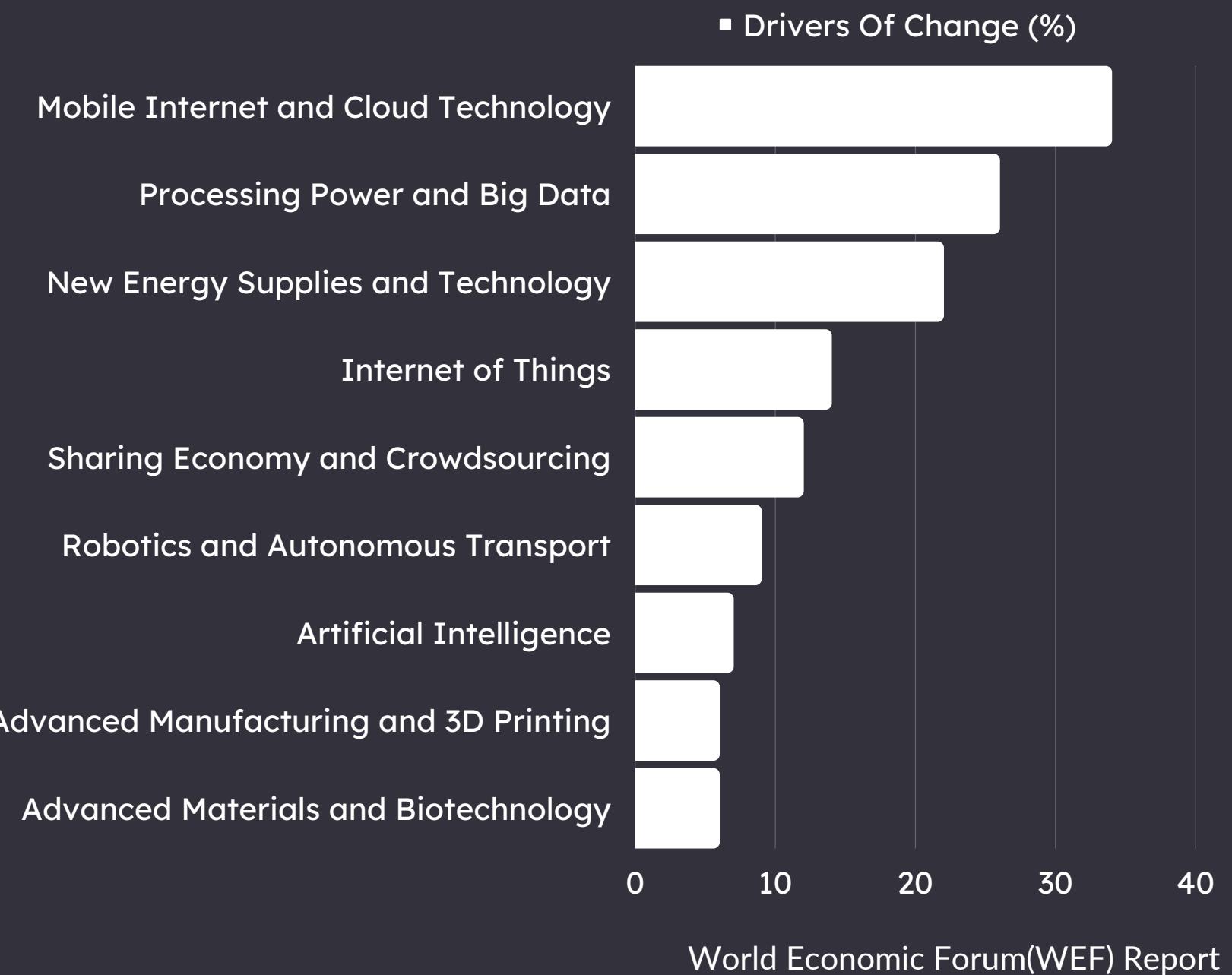


# Objective & Industry Overview

Let us understand how robotic labs help all the stakeholders:

- **Students:** A platform for students to integrate STEM streams.
- **Teachers:** Relate classroom concepts to real-life, develop an affinity towards technology and increase students' motivation.
- **Management:** Institute gets an integrated STEM Lab and global standard robotics program.
- **Parents:** It instills core life skills such as critical thinking, teamwork and problem solving in children of different ages.

Technological and socio-demographic factors are further expected to change employment dynamics, impacting job functions, roles and skills by 2022



# Type of Robotics Lab



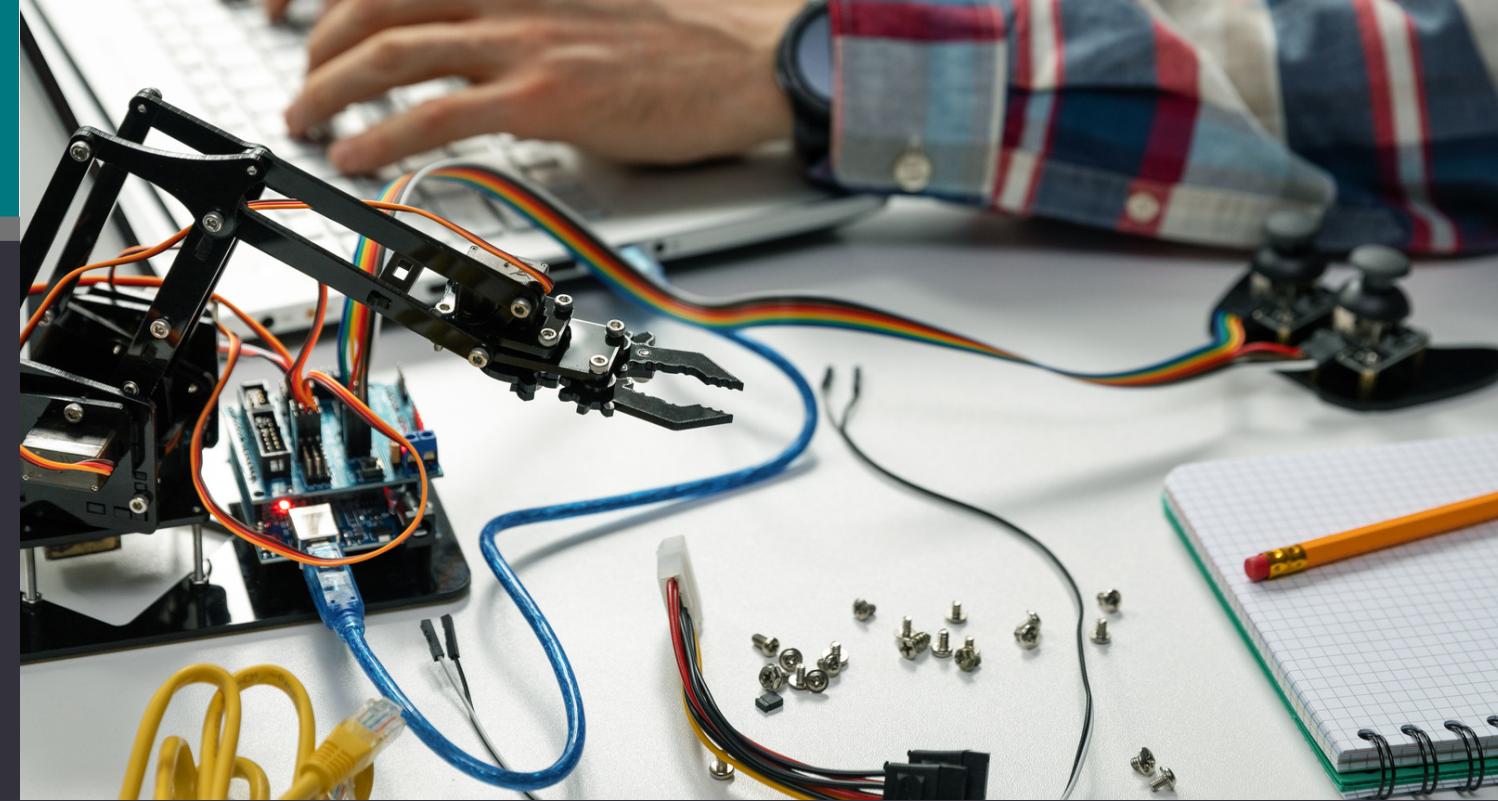
| S/N | Lab Sections and details       | Option 1 | Option 2 |
|-----|--------------------------------|----------|----------|
| 1   | Instrumentation Section        | ✓        | ✓        |
| 2   | Mechanical Section             | ✓        | ✓        |
| 3   | Electronics Section            | ✓        | ✓        |
| 4   | Robotics Section               | ✓        | ✓        |
| 5   | Software Section               | ✓        | ✓        |
| 6   | UAV Section                    | ✓        | ✓        |
| 7   | 3D Printing Section            | ✓        | ✗        |
| 8   | Individual Kits                | ✓        | ✗        |
| 9   | In-house Training              | ✓        | ✓        |
| 10  | Project Based Curriculum       | ✓        | ✓        |
| 11  | Certification                  | ✓        | ✓        |
| 12  | Competition Focused Projects   | ✓        | ✓        |
| 13  | Train The Trainer Option (TTT) | ✓        | ✗        |

# Institute Membership (Option1)

Institute can add-on Robotics as subject for all its student' studying Science, Technology, Engineering and Mathematics (STEM) or as an extracurricular activity. Low cost annual membership fee can be added in regular fee structure.

All member students would be availing following benefits throughout year:

- Lab Setup: Advance feature Robotics Lab will be set up with all latest equipment and components.
- Weekly 2 hrs (Total 45 - 64 hrs) in-house training: Certified trainer would visit institute campus as per mutually decided schedule. 1 trainer will be provided .
- Study Materials: Comprehensive content developed with support of eDC – IIT Delhi and AICRA. Projects based manuals and study modules will be provided.
- TTT Program : This option is also open faculty can be trained on additional charges .
- International Competition Preparation: Training and guidance to prepare learners to participate in International level of Robotics Competitions to represent institute.
- Certification: Progressive certification from All India Council for Robotics & Automation (AICRA)



## Institute Obligations:

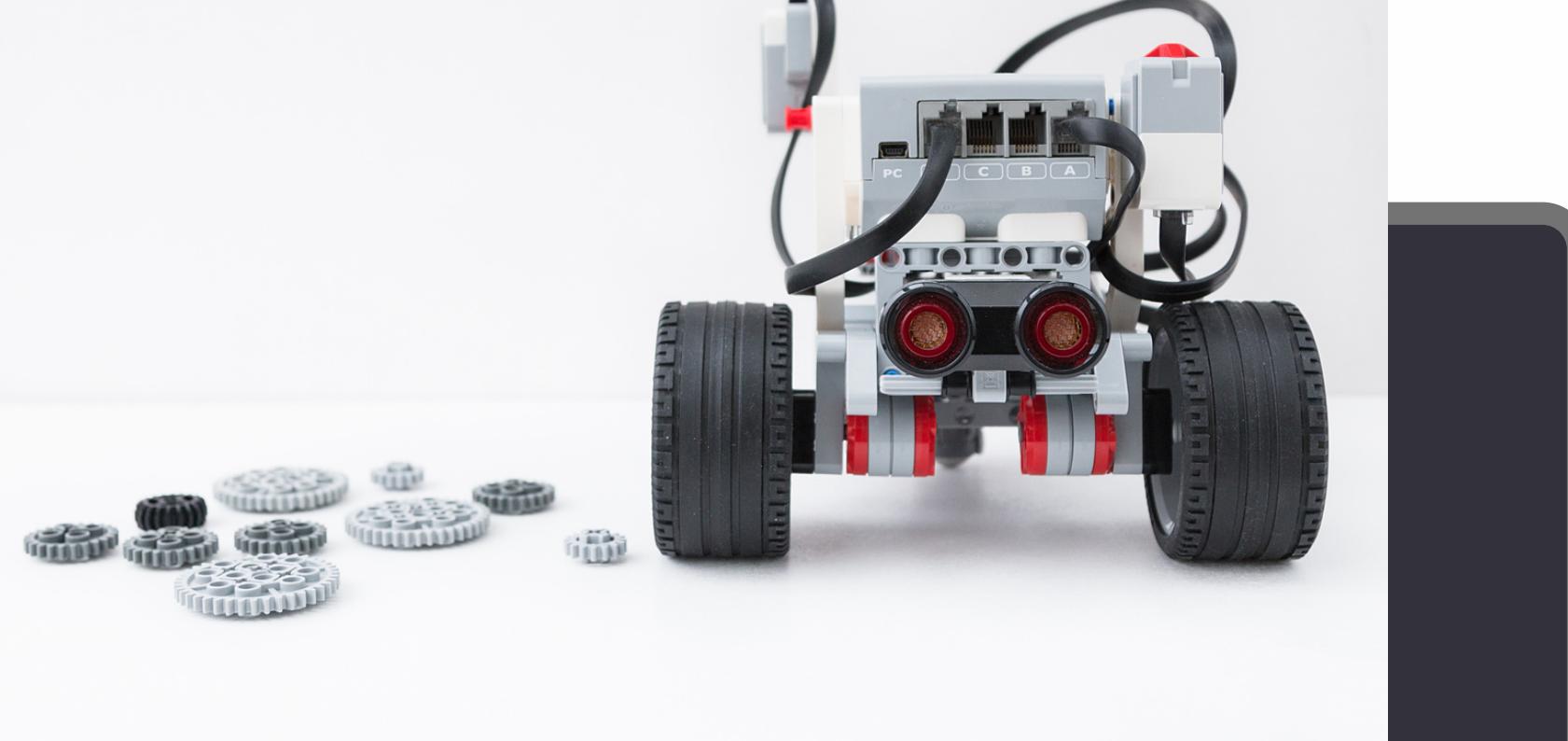
- Minimum 50 -100 members required.
- 1 faculty SPOC to coordinate with student members.
- Lab area along with desired infrastructure.

|   |                          |
|---|--------------------------|
| <b>Robotics Lab Inception Cost</b>                    | <b>₦7,740,000</b>        |
| <b>AMC &amp; service charges</b>                      | <b>₦774,000 per year</b> |
| <b>Tuition cost per student</b>                       | <b>₦7,740 per term</b>   |
| <b>AICRA certification &amp; exam fee per student</b> | <b>₦6,450 per year</b>   |
| <b>TTT for 10 days</b>                                | <b>₦1,548,000</b>        |
| <b>Student Registration</b>                           | <b>₦15,500</b>           |

# ZERO INCEPTION COST (Option 2)

Institute can add-on Robotics as subject for all its student' studying Science, Technology, Engineering and Mathematics (STEM). Low cost annual membership fee can be added in regular fee structure. All member students would be availing following benefits throughout year:

- Lab Setup: Advance feature Robotics Lab will be set up with all latest equipment and components by the company.
- Project Manuals: Level based project manuals will be provided that would help internal faculty to provide trainings to student.
- Weekly 2 hrs. (Total 45 - 64 hrs.) in-house training: Certified trainer would visit institute campus as per mutually decided schedule. Session can be increased basis on student count.
- Online & Telephonic Support: All time support available for faculties who have gone through TTT Program throughout year.
- Free Seminar: Twice in a year free seminar on updated technology in robotics field online depending on students preference .
- Certification: Based on annual test, learners will be provided level certificate from All India Council for Robotics & Automation (AICRA)



|   |   |
|---|---|
| <b>Institute Obligations:</b>                         | <ul style="list-style-type: none"> <li>• 1 faculty SPOC to coordinate</li> <li>• Lab area along with desired infrastructure.</li> <li>• Minimum commitment of 50+ Students</li> </ul> |
| <b>Robotics Lab Inception Cost</b>                    | -   |
| <b>AMC &amp; service charges</b>                      | -   |
| <b>Tuition cost per student</b>                       | <b>₦21,500 per term</b>   |
| <b>AICRA certification &amp; exam fee per student</b> | -   |
| <b>TTT for 10 days</b>                                | -   |
| <b>Student Registration</b>                           | <b>₦15,500</b>  |

# Modules & Projects

Robotics opens up a plethora of opportunities for students and entrepreneurs.

Robotics education in India is an emerging field and along with high interest and demand among the students the potential is immense.



Robotics being a rapidly growing field, research, design, and development of new applications play a vital role in taking the Indian industry to new heights. The objective of the Next Generation Robotics Lab is to provide the learners a comprehensive coverage of the theory and practice in the area of robotics, to prepare them to take up advanced research.

The learning modules comprises advance level of knowledge of components, software, design and creative thought process that helps learners to develop projects.

The NxR provides the following AICRA certification post completion of the program.

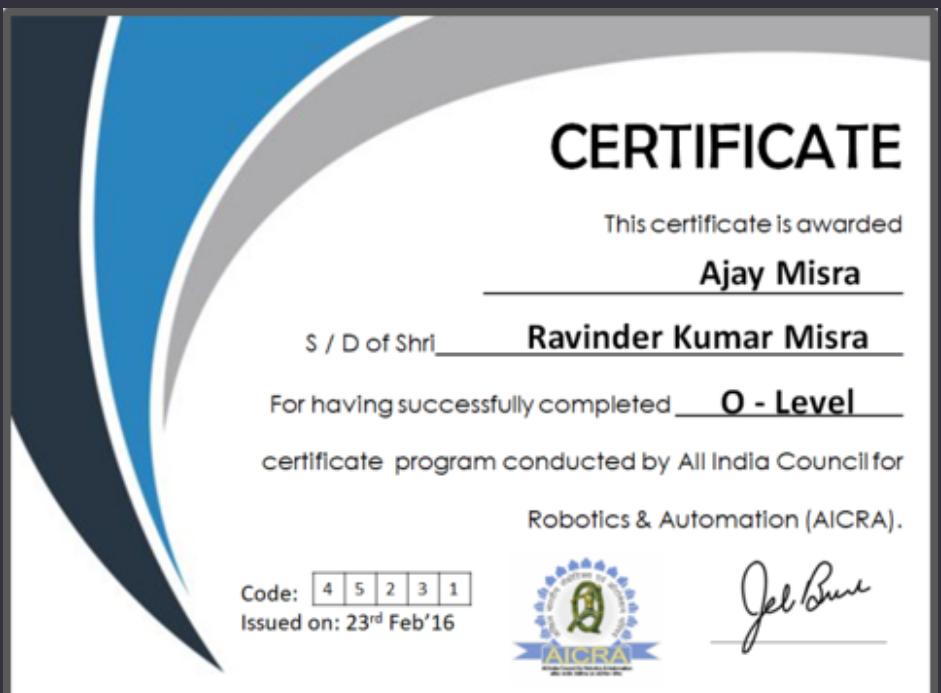
- O – Level for beginners
- A – Level for Advance Learners
- B – Level for Technology Specialists
- C – Level (optional for professionals after 3 yrs)

# O - Level Certification

Clear your basic robotics concept. Beginners would make initial level of Robotics Project

## Pre-requisites:

- Science and Mathematics should be the subjects in institute curriculum.
- Interest in Robotics



## Modules To Be Covered

- Robot Introduction
- Robotics application
- Electronics 101
- Logic gates and ICs
- Microprocessor & Microcontroller
- Fundamentals of Arduino
- Sensor interfacing
- Motors and actuators interfacing
- Line follower Robot
- Autonomous robotics
- RF communication

## Projects

- LED Glow over breadboard
- Basic Circuit over Breadboard
- LED Blinking using Arduino
- Multiple LED pattern using Arduino
- LED Control using IR Sensor
- Motor control using Arduino
- Black Line Follower
- White Line Follower
- Obstacle Avoider Robot
- RF Control Robot

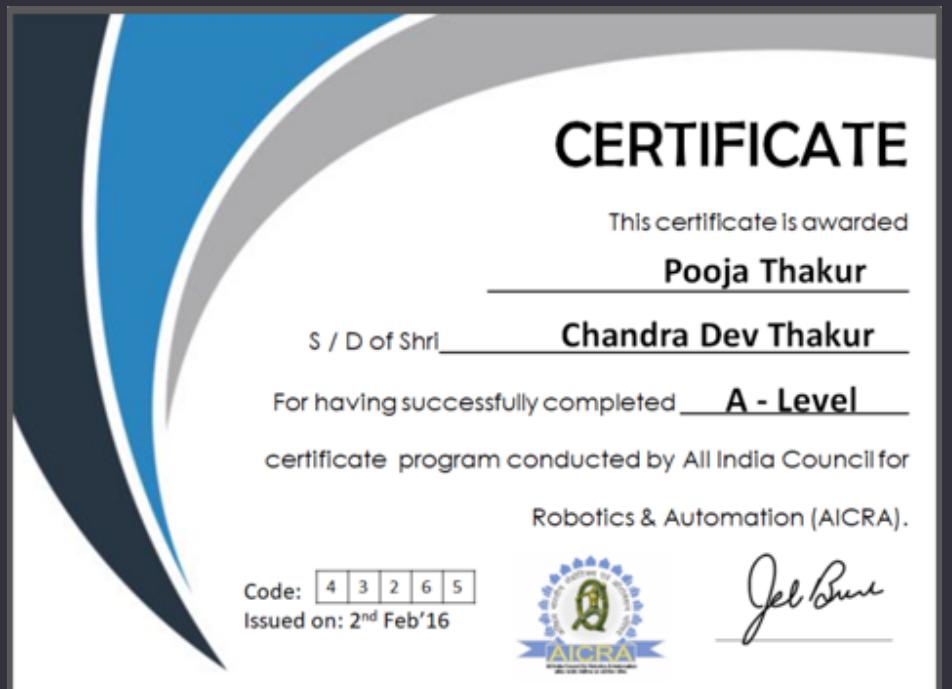
# A - Level Certification

Learners would start developing advance level of Robotics Projects.

Options to design Home and school automation projects.

Pre-requisites:

- Basic knowledge of Electronics.
- O-Level Certified by AICRA or clearing entrance test conducted by AICRA



## Modules To Be Covered

- Robot development analogy
- Understanding of locomotion
- Embedded system & Robotics
- AVR/Arduino microcontroller
- Sensor interfacing with AVR
- Wireless communication
- Bluetooth Controlled Robot 8
- DTMF control Robot
- Solar control Robot
- What is GPS and interfacing of GPS

## Projects

- LED Blinking using AVR
- LED Control using IR Sensor by AVR
- Motor Control using AVR
- Line Follower Robot using AVR
- Edge Avoider Robot
- Wall Follower Robot
- Bluetooth Control robot using Arduino
- DTMF Control using Arduino
- Solar Interface using Arduino
- Location defining using Arduino

# B - Level Certification

Marine, surface and space.

Learners would be able to develop all type of robots. This expert level of training would enable them to do lots of advance research in robotics field.

Pre-requisites:

- Advance knowledge of Electronics.
- A-Level Certified by AICRA or clearing entrance test conducted by AICRA



## Modules To Be Covered

- Advance Embedded System
- Digital Electronics
- Microcontroller Architecture & Embedded C
- Advance Arduino Programming
- Gesture control robot
- ARM Microcontroller
- Sensor Interfacing With LPC2138/48/stm32
- Controlling Actuators using ARM Microcontroller
- Wireless Communication using ARM Microcontroller
- Quad copter

## Projects

- Home Automation Project 1- Arduino
- Home Automation Project 2- Arduino
- X-Bee Control using Arduino
- Gesture Control Robot
- LED Blinking with ARM
- Sensor interfacing with ARM
- Motor Control with ARM
- SPI & I2C Communication with ARM
- CAM Protocol with ARM
- Quad copter Flying

# C - Level Certification

## Pre-requisites:

- Advance knowledge of Electronics.
- B-Level Certified by AICRA or clearing entrance test conducted by AICRA



## Modules To Be Covered

- Welcome to the World of Internet of things
- Fundamentals of IOT
- Programming Technologies
- Raspberry Pi Programming
- Network Programming & Wireless Technologies
- Edge Computing & Protocols
- IoT with Arduino & IoT with Raspberry Pi
- IoT with Blynk
- Thingspeak IoT

## Projects

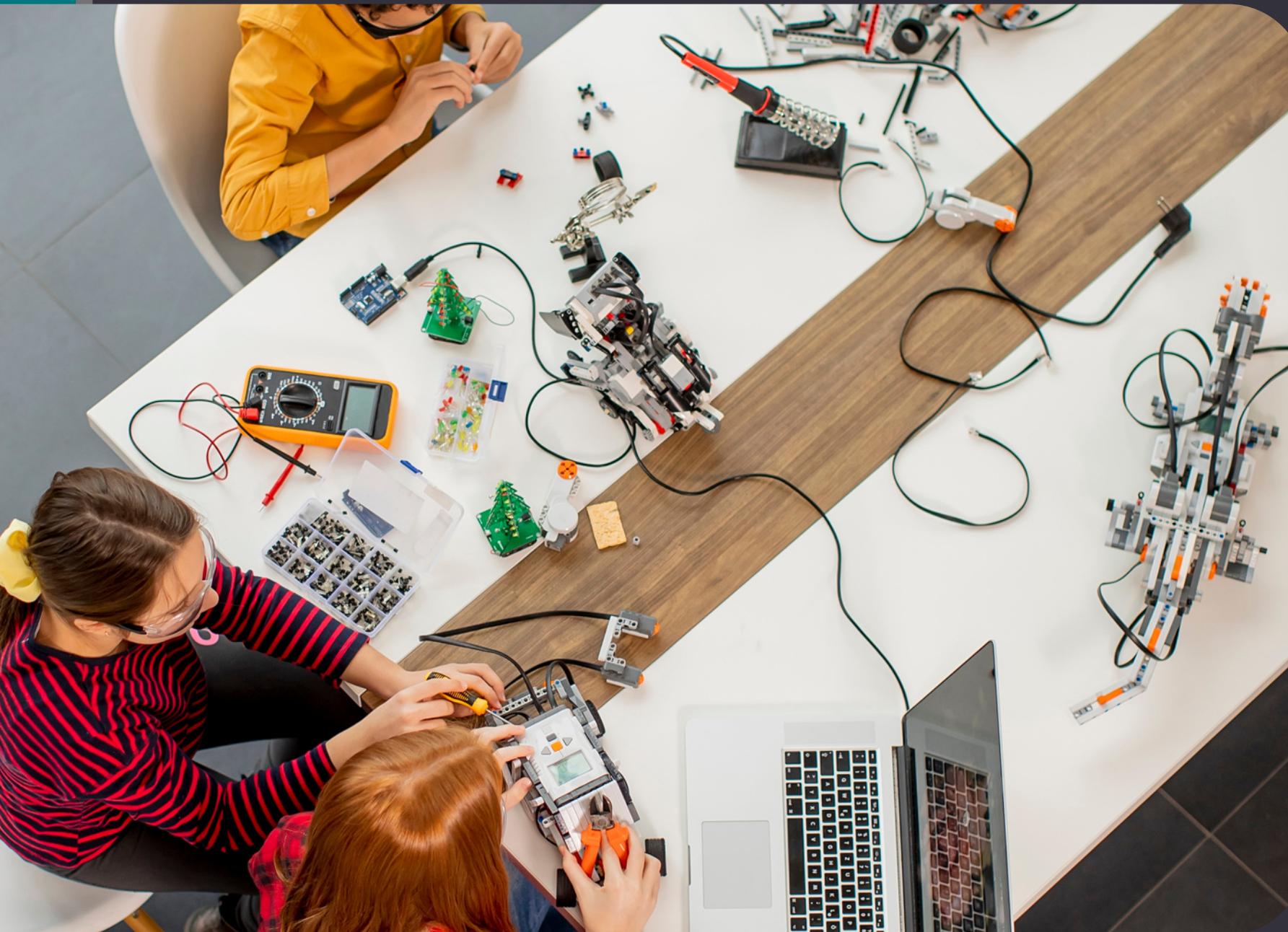
- LED Blink with Raspberry Pi
- LED Control using switch in Raspberry Pi
- Bluetooth Programming in Raspberry Pi
- LED Control through internet using IoT
- Home Automation Project 1
- Home Automation Project 2
- Home Automation Project 3
- Home Automation Project 4
- Weather forecast using Thing Speak
- Patient Pulse & Heartbeat reading via IOT

# Infrastructure needed For Robotics Lab

Robotics Lab requires minimum 300 SqF to 1000 SqF of furnished area with a capacity to accomodate 50-75 students at a time. Details of the infra as follows:

| S.No | Items   | Quantity      |
|------|---|---------------|
| 1    | Desktop Computers / Laptops (minimum i3 Core processor and 4GB RAM) | Minimum 5     |
| 2    | Computer Desks  | 5             |
| 3    | Chairs  | 25-30         |
| 4    | Electricity ports (single phase and three phase connection)         | Minimum 25    |
| 5    | Internet Connection   | Minimum 2mbps |
| 6    | Projector screen  | 1             |
| 7    | Storage Cupboards with lockers                                      | 2             |
| 8    | White Board   | 6ft X 4ft     |
| 9    | Bookshelves   | 1             |
| 10   | Display Table   | 6ft X 6ft     |





Next generation Robotics lab

## COMMITTED TO DEVELOPING THE NEXT GENERATION ROBOTICS SOCIETY

Next generation Robotics lab is a community of students in a particular education institute who are willing to acquire knowledge on Robotics. The club will be offered training programs mixes the creativity and curiosity of young students with the hands-on education aspects of Science & Technology. With focus on robot building and Science based activities, Our learning methodology takes up innovative and challenging ideas and converts them in to solutions in the form of working robots or engaging science experiments.