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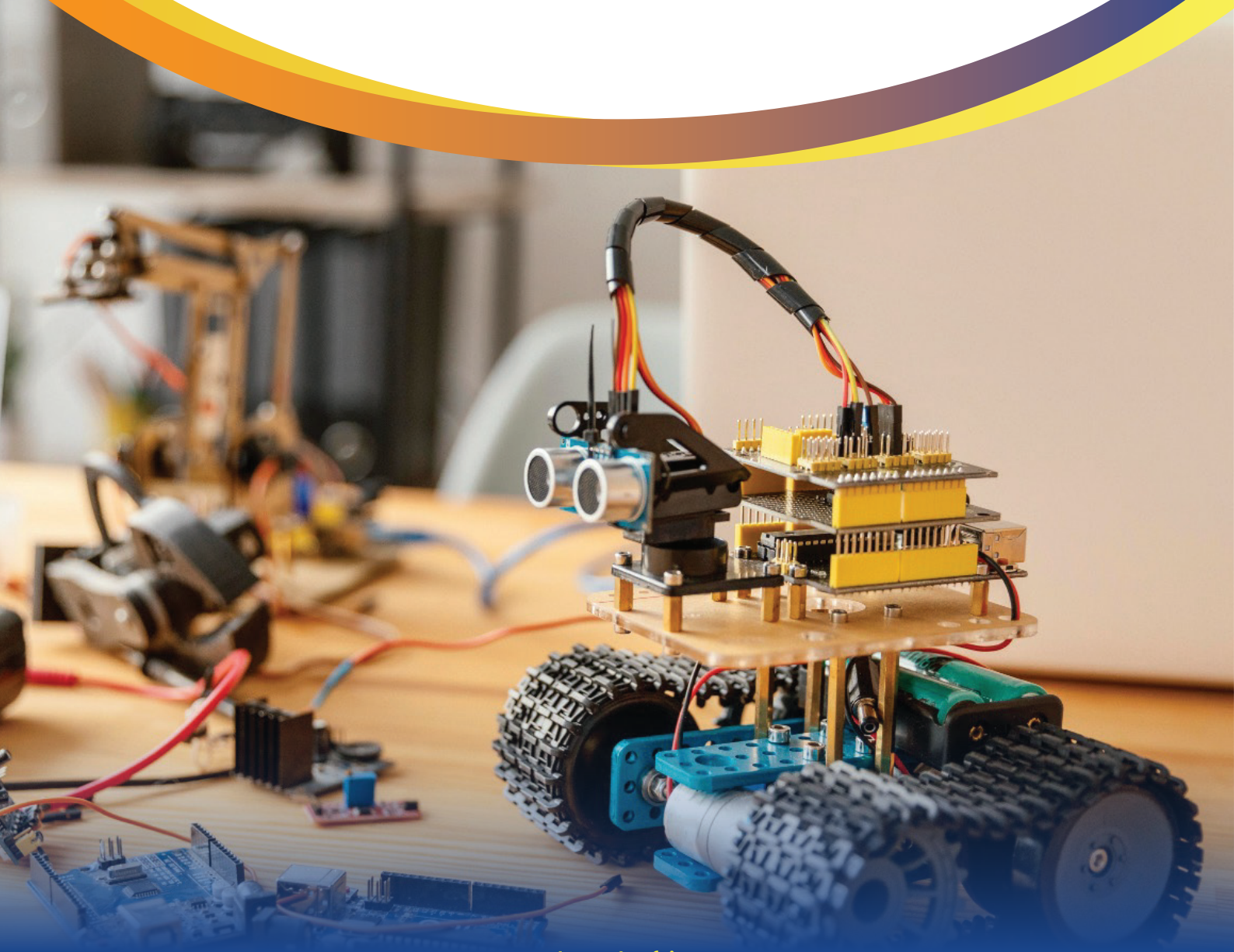
ROBOTICS & IOT

3 MONTHS



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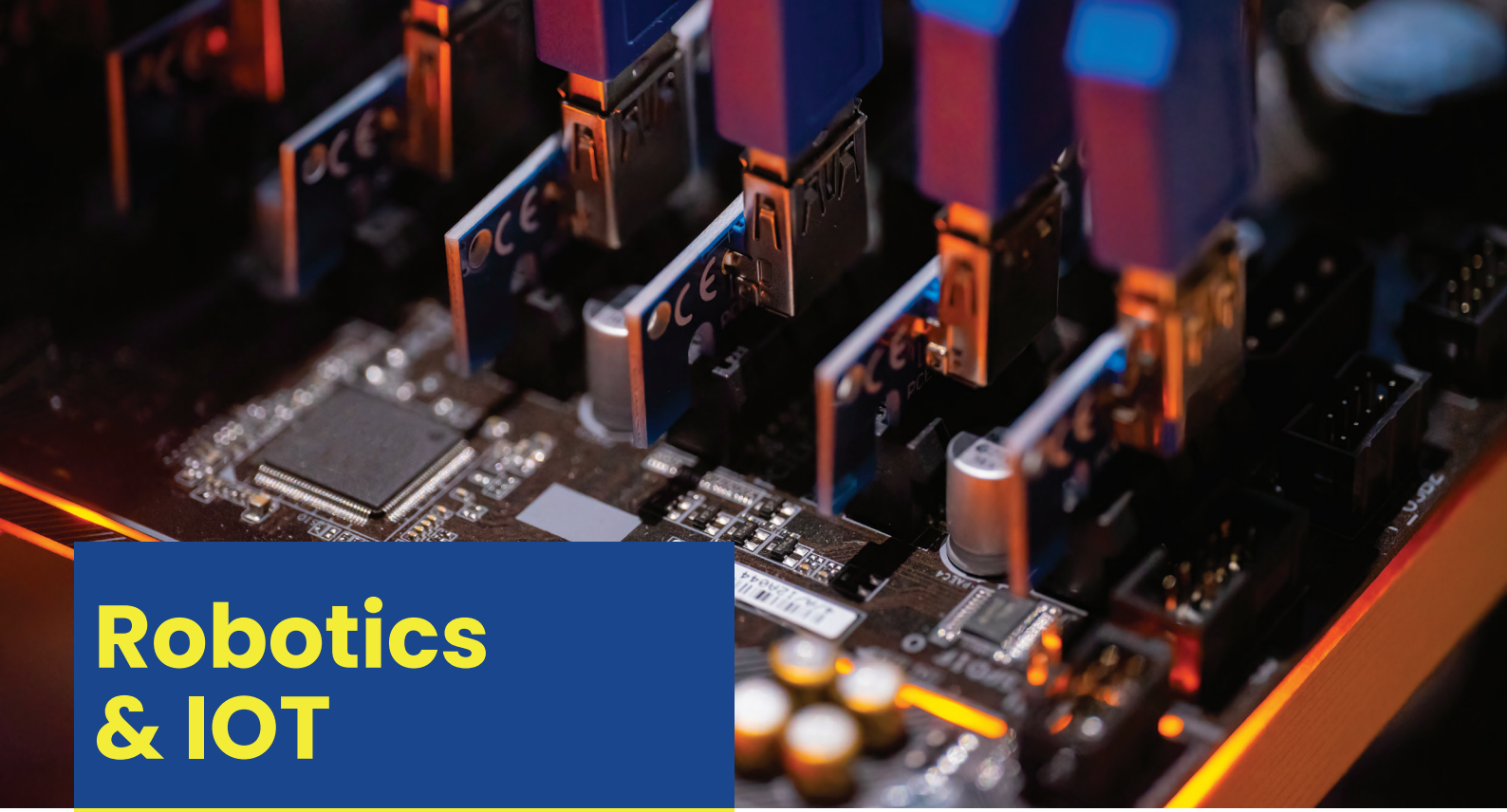

Robotics & IOT

Curriculum Index

INTRODUCTION
1. Electronics Languages
2. Embedded C Programming
3. Micro-controller Sensors

BASICS OF ELECTRONICS
1. Number system
2. Boolean Algebra
3. About Basic Electronic Components
4. Power supplies, voltage regulators. Thermal considers.
5. Schematics and wiring diagrams, recommended

EMBEDDED C
1. Keywords and data type
2. Operators
3. Flow Control
4. Loops & Functions

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1. Introduction
2. Board Description
3. Arduino IDE
4. Date types
5. Delay
6. Input Output Function

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1. LED Blinking
2. LED with switch
3. LED with IR Sensor
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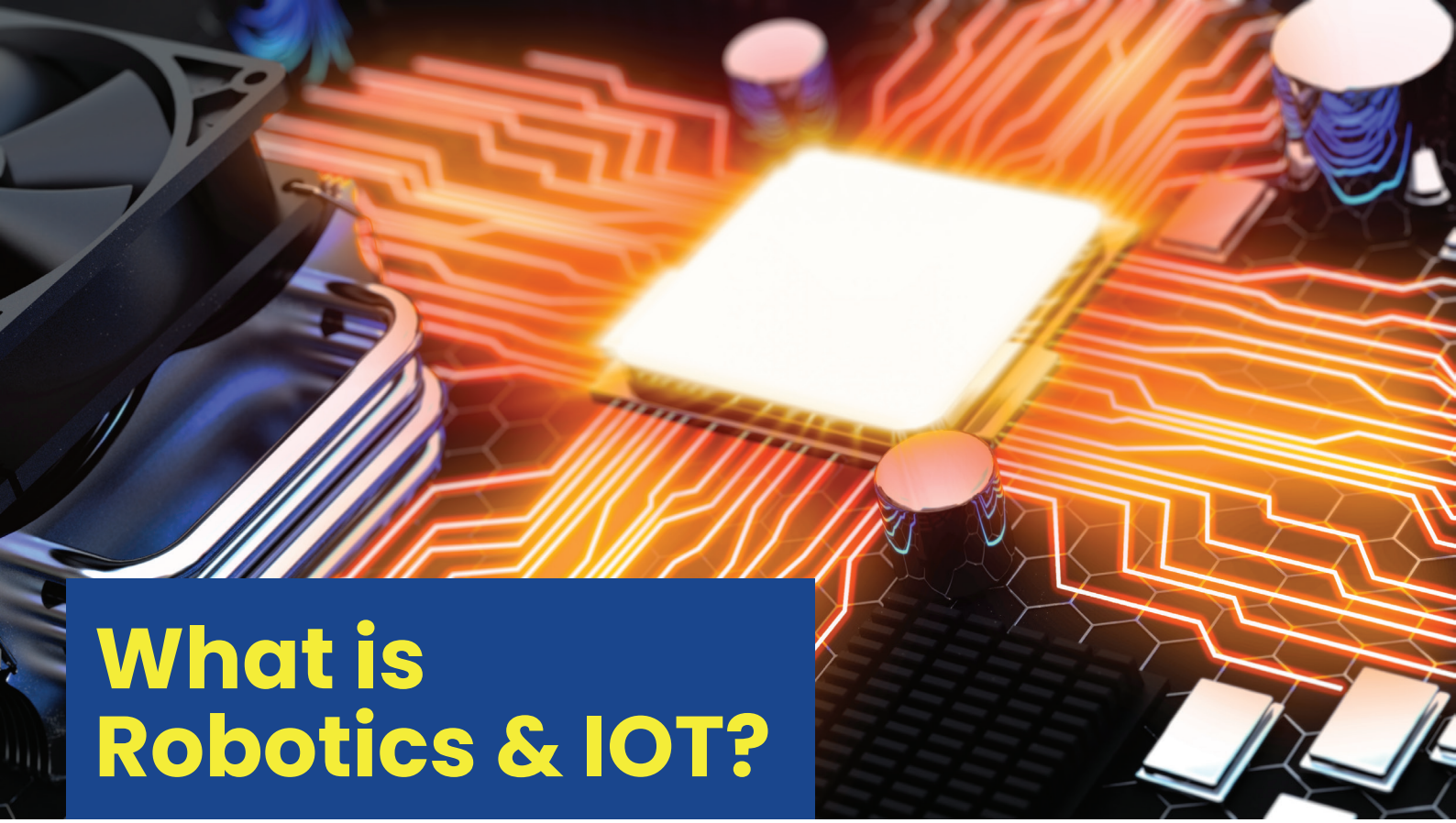
3. Ultrasonic Sensors
4. LDR

REAL TIME PROJECT
1. Mobile Control Robot
2. Automatic street light
3. Home Automation
4. Keypad Door lock
5. Arduino with 8 x 8 LED Matrix



What is Robotics & IOT?

An Embedded System is a system that has software embedded into computer-hardware, which makes a system dedicated for a variety of application or specific part of an application or product or part of a larger system.

An embedded system can be a small independent system or a large combinational system. It is a microcontroller-based control system used to perform a specific task of operation.

An embedded system is a combination of three major components:

- **Hardware:** is physically used component that is physically connected with an embedded system. It comprises of micro-controller based integrated circuit, power supply, LCD display etc.

- **Application software:** Application software allows the user to perform varieties of application to be run on an embedded system by changing the code installed in an embedded system.

- **Real Time Operating system (RTOS)**: RTOS supervises the way an embedded system work. It act as an interface between hardware and application software which supervises the application software and provide mechanism to let the processor run on the basis of scheduling for controlling the effect of latencies.

One Example
Remember the functionality of a washing machine. In semi-automatic machines user sets the timer, water level and amount of detergent to use, and rest of the operation is done by machine itself, as per the parameters setup by user.

In fully automatic washing machine, user just put the clothes in the machine and rest all the tasks are done by machine itself.

Can you guess who is controlling the automatic operations of machine?

How a washing machine is intelligent enough to do tasks automatically?

What is the brain of a washing machine?

Yes !! It is an Embedded System. Embedded system is the brain of washing machine (or any automatic machine or device). There is an Embedded system inside a washing machine which get inputs from user, save those inputs in its memory and operate the machine as per the inputs.

Isn't it Interesting ?

It means, if you know how to make an Embedded System then you can automate any task with the help of it.

Projects based on embedded Systems

- Central heating systems
- GPS systems
- Fitness trackers
- Medical devices
- Automotive systems
- Transit and fare collection
- ATMs
- Factory robots
- Electric vehicle charging stations
- Interactive kiosks
- Water level controller
- Password based door lock system
- Water level indicator commonly used in hotels and factory

Career Opportunities in Embedded Systems

- Embedded Software Engineer (firmware)
- System Software Engineer (kernal & RTOS)
- Application Software Engineer (device drivers)
- Software Test Engineer.
- Embedded Hardware Engineer.
- Embedded System Trainer.
- Marketing & Sales Executive.

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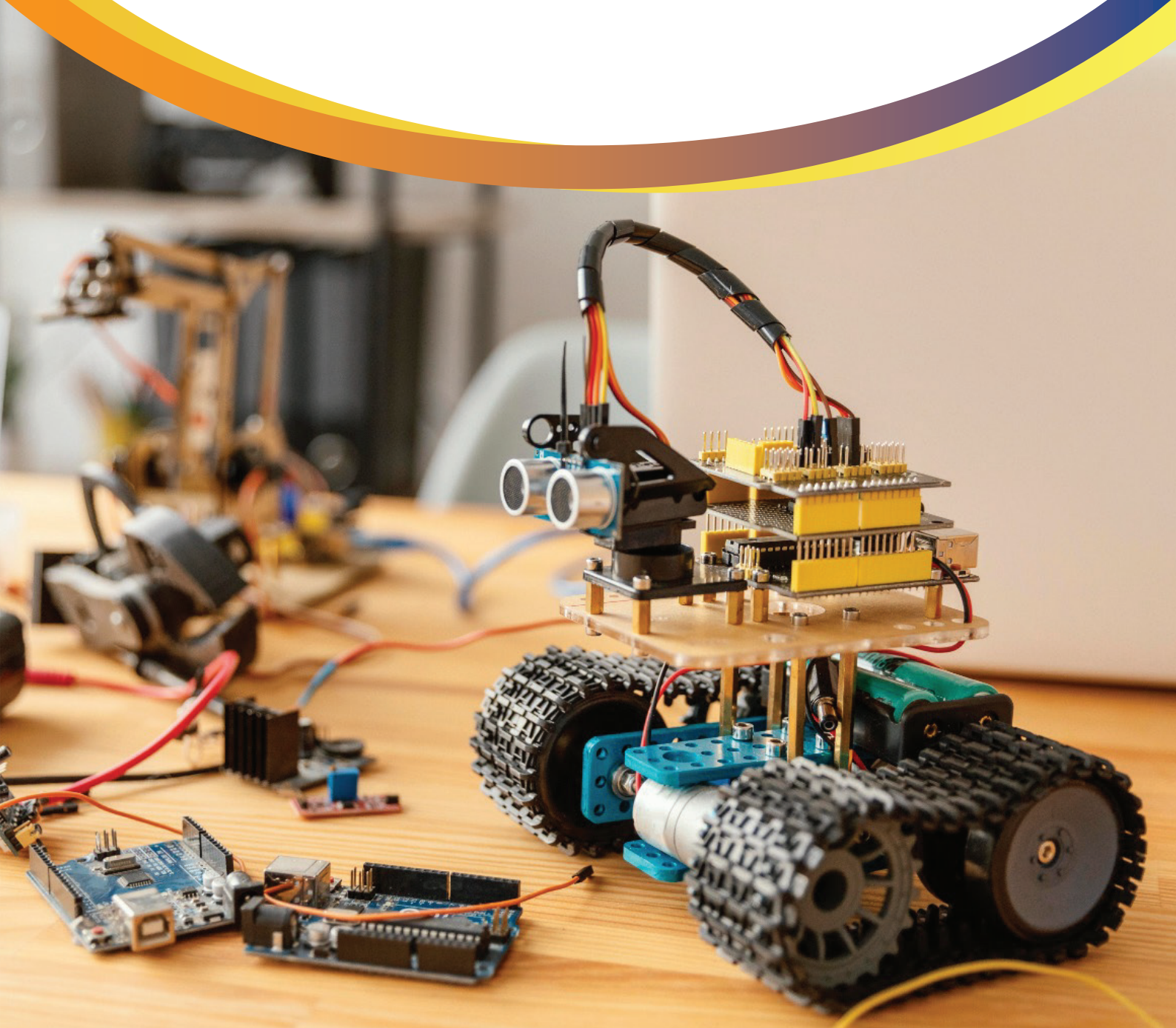
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