Class 4th – Beginner Electronics Automation Projects

Projects in the Kit:

- **Laser Security System**
  Make a basic alarm system that rings when someone crosses a laser beam — just like security used in industrial area and offices
- **Fire Detection Alarm**
  Build a system that makes a sound when it feels heat or fire — like how robots help keep people safe.
- **LED ON/OFF Timer**
  Create a smart light that turns ON or OFF after some time — learning how robots can use timers to work on their own.

What You Will Learn:

- What robotics means and how it helps in real life
- The basics of electronics used in making robots
- How robots sense and react to things around them
- Introduction to automation – how robots do tasks automatically
- How to use sensors, lights, buzzers, and simple circuits
- What is a timer, and how robots use timing to work smartly
- Gain confidence by building fun and working projects with your own hands
- Improve thinking, creativity, and problem-solving through building

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Class 5th – Microcontrollers & Sensors and basic C programming

Projects in the Kit:

- **LED Blinking Circuit using Arduino Uno**
  Learn how to turn an LED light ON and OFF using a small robot brain called Arduino. This is the first step into robotics coding!
- **Automatic Light System using LDR Sensor**
  Make a light that turns ON when it's dark and OFF when it's bright — just like smart street lights.
- **Object Detection using IR Sensor**
  Build a simple robot eye that can "see" objects in front of it and take action — like stopping or sounding an alert.

What You Will Learn:

- What is Arduino, and how it helps in robotics
- Introduction to robot brain (microcontroller) and how it works
- How to write simple code to control electronics
- What are sensors and how robots use them to “see” and “feel”
- Basics of automation — how machines can do tasks by themselves
- How light sensors (LDR) and IR sensors help in smart systems
- The difference between manual control and automatic systems
- Build confidence, creativity, and curiosity through fun learning

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Class 6th – Sensors, Motors, LCD, Arduino Core

Projects in the Kit:

- **Toll Gate System**
  Make an automatic gate that opens and closes when a vehicle is detected — using sensors and a servo motor.
- **Gas Detection System**
  Build a system that senses harmful gases and gives an alert — just like robots used in industries and homes for safety.
- **Environmental Weather Station System**
  Create a mini weather station that checks temperature, humidity, and air quality — learning how robots collect environmental data.

What You Will Learn:

- How robots use sensors and motors to work automatically
- What are servo motors, Gear motors and how they move robotic parts
- Basics of safety systems using gas sensors and alarms
- How robots collect and display weather and environmental data
- Introduction to real-world applications of robotics in cities, industries, and homes
- Learn how to combine coding, sensors, and movement to create smart systems
- Boost logical thinking, hands-on building, and creativity with real tech tools

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Class 7th – Autonomous Robots and Smart Navigation

Projects in the Kit:

- **Line-Following Robot**
  Build a robot that follows a black line on the ground — like the robots used in factories and warehouses for transport.
- **Obstacle-Avoiding Robot Car**
  Create a smart car that detects objects in its way and changes direction automatically — just like self-driving cars.
- **Light-Seeking Robot**
  Make a robot that moves toward light, similar to how solar robots find sunlight for charging.

What You Will Learn:

- How to make robots that move on their own
- Use of IR sensors, motor drivers, and logic control
- Understand how robots follow paths, avoid obstacles, and make decisions
- Learn about autonomous systems — machines that work without human help
- How light and sensors help robots interact with the environment
- Combine electronics, coding, and robotics engineering
- Improve problem-solving, design thinking, and real-world robotics skills

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Class 8th – Wireless Control

Projects in the Kit:

- **Bluetooth-Controlled Car**
  Make a robot car that you can drive using a mobile app over Bluetooth. It teaches how robots can receive and follow commands wirelessly.
- **Wi-Fi-Controlled Car**
  Create a robot that connects to Wi-Fi and can be controlled through a webpage or mobile browser — just like IoT (Internet of Things) robots.
- **Voice-Controlled Car**
  Build a car that listens to your voice commands like “Go,” “Stop,” or “Turn,” using a smartphone’s voice assistant or app.

What You Will Learn:

- Introduction to wireless technology in robotics
- How Bluetooth and Wi-Fi are used to control robots remotely
- Understanding IoT (Internet of Things) basics
- How to build and control smart cars with voice commands
- Basics of data communication between robot and mobile

- Design and develop real-world smart robotics systems
- Improve skills in coding, electronics, communication, and creative thinking

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Class 9th – Mechanical Systems

Projects in the Kit:

- **Conveyor Belt**
  Make a conveyor system where students can change the speed using a dial or program — learning how real systems adjust speed based on need.
- **Pulley-Based Lifting System**
  Learn how pulleys reduce effort and help lift objects easily — just like cranes and elevators.
- **Rack and Pinion Linear Motion Model**
  Build a system that turns rotary motion into straight-line movement — used in cars, robotics arms, and automation machines.

What You Will Learn:

- Basics of mechanical systems used in robots and machines
- Understand how pulleys, gears, and levers reduce effort
- Learn about linear motion, rotary motion, and mechanical advantage
- Build real-world models of lifting systems and motion converters
- Connect mechanical concepts with robotics thinking
- Develop problem-solving, designing, and physical modeling skills
- A perfect step before entering advanced robotics or automation fields

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Class 10th – Moving Belts and Smart Control

Projects in the Kit:

- **Self-Balancing Robot**
  Build a robot that stays upright and balances on two wheels using sensors — just like Segway and advanced delivery robots.
- **Conveyor Belt with Size-Based Sorting System**
  Create a working model of a conveyor belt that moves objects and sorts them automatically based on their size using sensors.
- **Bottle Filling Automation System**
  Design a machine that detects bottles and fills them with liquid automatically — just like packaging robots used in industries.

What You Will Learn:

- How real industrial robots work in factories and warehouses
- Concepts of self-balancing and feedback control using sensors
- Use of conveyor belts and automation in smart systems
- How to combine motors, sensors, and logic for precision work
- Introduction to mechatronics — a mix of mechanics, electronics, and coding
- Learn how robots sense, decide, and perform tasks on their own
- Gain practical experience in real-world automation and robotics engineering

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Class 11th – 3D Printing & Advanced Robotics

Projects in the Kit:

- **Pick and Place Robotic Arm**
  Build a robotic arm that picks up objects and places them at different positions — just like robots used in assembly lines and 3D printing setups.
- **Gesture-Controlled Robot**
  Create a robot that moves based on your hand gestures — using sensors like accelerometers to follow motion commands.
- **Suction Cup Robot**
  Design a robot with a suction mechanism to lift and move light objects — simulating how vacuum grippers work in real factories.

What You Will Learn:

- How robotic arms and grippers are used in industries
- Basics of 3D motion control and kinematics in robotics
- Use of gesture sensors and accelerometers for wireless input
- Understanding of suction mechanisms for material handling
- Advanced concepts of mechatronics, robotics automation, and real-time control
- Improve coding, coordination, logic building, and mechanical design
- Experience the building blocks of robot-assisted manufacturing and smart automation

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Class 12th – Applications with IoT & Advanced Control

Projects in the Kit:

- **Automatic Sliding Robot**
  Build a robot that slides smoothly along a path to transport or align objects automatically — useful in packaging and smart doors.
- **Hexapod Robot**
  Create a robot with six legs that walks like an insect using advanced servo motors and balance algorithms — learning how walking robots work in real terrain.
- **Robotic Arm with Conveyor and Object Detection**
  Design a system where a robotic arm detects an object on a moving conveyor and picks it up — just like robots used in sorting and packaging industries.

What You Will Learn:

- Build complex robotic systems combining multiple functions
- Learn how multi-legged robots move, balance, and navigate
- Use of smart sensors for object detection and automation
- Combine robotic arms, conveyor belts, and AI logic
- Deepen understanding of mechanics, electronics, coding, and real-time systems
- Explore concepts used in AI, Industry 4.0, and smart factories
- Gain hands-on skills in mechatronics, automation, and robotics engineering — perfect for future careers in tech