Vivekanand School - MICRO PLANNER (2024-25)						
Month	Sessions	Topic	Activity	Kits	Skills	Learning Outcome	Teacher Mannual

Month	Sessions	Topic	Activity	Kits	Skills	Learning Outcome	Teacher Mannual
April	1	STEM Orientation					
	2	Introduction to Basic electronics and components	Hardware components Description and Kit	Electronics Kit	Basic Electronics	Students will learn to build simple electric circuits using batteries, wires, bulbs, resistors, capacitors, and switches.	NA
	3	LED & Breadboard	Led Glowing using Breadboard and battery	Electronics Kit	Basic Electronics	Students will learn to construct a basic LED circuit using a battery, resistor (if required), and appropriate wiring.	NA
	4	Transister and LDR	Use of IR Sensor, transister and LDR	Electronics Kit	Basic Electronics	Students should be able to design simple transistor circuits, such as a basic amplifier or a switch circuit, and understand how changes in component values affect circuit behavior.	NA
	5	Project	Automatic Room light\doorbell	Electronics Kit	Basic Electronics	Students will develop a basic understanding of electronic components such as resistors, capacitors, transistors, LDRs, and buzzers, as well as their functions within the circuits.	NA
May	1	Led Blinking	Led Blinking	Ablox	Electronics and Logical Thinking	1. Students will learn how to design a simple circuit that includes an LED, a switch, and appropriate resistors. 2. Students will be introduced to block-based programming environments compatible with Arduino.	NA
	2	Project-Control 3 LEDs	Traffic light	Ablox	Electronics and Logical Thinking	1. Students will be able to design, build, and troubleshoot a simple traffic light circuit using LEDs, resistors, and a control mechanism (e.g., push buttons or timers).	NA
	3	led control with switch	Switch control led	Ablox	Electronics and Logical Thinking	1. Students will be able to design, build, and troubleshoot a simple LED control circuit using switches to turn the LEDs on and off. 2. Students will understand the concept of input (switch) and output (LED) devices within a circuit, and how the state of the switch affects the behavior of the LEDs.	NA
	4	Kreativity Show					
	5	SUMMER CAMP					
July	1	Revision of Ablox with LED, Projects	Led Blinking, Traffic Light, Switch Control Led	Ablox	Electronics and Logical Thinking	1. Students will learn how to design a simple circuit that includes an LED, a switch, and appropriate resistors. 2. Students will be introduced to block-based programming environments compatible with Arduino.	
	2	led with potentiometer	Led Fading	Ablox	Electronics and Logical Thinking	1. Understand how a potentiometer can be used to vary resistance and consequently adjust the brightness of an LED. 2. Learn how to visually program the Arduino using blocks to read the potentiometer value and control the LED brightness.	NA
	3	Servo motor	Servo Interfacing	Ablox	Electronics and Logical Thinking	1. Learn about servo motors, their components, and how they differ from other types of motors. 2. Understand how to program a microcontroller (like Arduino) to control a servo motor.	NA
	4	Ultrasonic sensor	Ultrasonic sensor interfacing with Arduino	Ablox	Electronics and Logical Thinking	1. Learn about ultrasonic sensors, including how they work using sound waves to measure distance. 2. Develop programming skills to control the ultrasonic sensor using Arduino, particularly in sending ultrasonic pulses and measuring their reflection.	NA
	5	Final Project	Problem Statement	Ablox	Electronics and Logical Thinking	1. Learn about different types of sensors (like ultrasonic, infrared, or motion sensors) that can be used to trigger the gate's opening and closing. 2. Encourage creativity in applying the automated gate system to real-world scenarios, like home automation, parking barriers, or secure entry systems.	NA
August	1	Simple Machine	4WD car	MechanzO 9+	Creativity and Engineering	1. Grasp the fundamental principles of four-wheel drive systems, including traction, force distribution, and torque. 2. Develop the ability to test hypotheses and make adjustments based on observations.	NA
	2	complex machine	Speed adjusted car with gear	MechanzO 9+	Creativity and Engineering	1. Learn about the mechanical advantage provided by different gear setups. 2. Understand gear ratios and how they affect speed and torque.	NA
	3	final project	Drag and Drop bot	MechanzO 9+	Creativity and Engineering	Develop skills in designing and constructing a functional model car.	NA
	4	complex machine	Mechanical Base	MechanzO 9+	Creativity and Engineering	Students will learn about the basic mechanics of a car, including how different components like wheels, axles, and gears work together.	NA
September	1	complex machine	Fixing of motors and gears	MechanzO 9+	Creativity and Engineering	1. Grasp the fundamental principles of four-wheel drive systems, including traction, force distribution, and torque. 2. Develop the ability to test hypotheses and make adjustments based on observations.	
	2	complex machine	Fixing of Mopper Assembly	MechanzO 9+	Creativity and Engineering	Develop skills in designing and constructing a functional model car.	NA
	3	complex machine	Mopping robot	MechanzO 9+	Creativity and Engineering	1. Grasp the fundamental principles of robotic movement and task automation. 2. Understand the importance of efficient design in robotics.	NA
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	5						NA

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April	1	STEM Orientation					
	2	Introduction to Python and its installation	Use of inbuilt method	Python idle	Logical and Computional Thinking	1. Understand key features that make Python user-friendly (like simple syntax, readability). 2. Understand where Python is used in the real world (e.g., web development, data science, automation).	NA
	3	Lines and angles	Draw Shapes with turtle	Python idle	Logical and Computional Thinking	1. Understand the concept of a "turtle" in a graphical programming environment. 2. Learn how to move the turtle in different directions (forward, backward).	NA
	4	Project-Practical geometry	square design	Python idle	Logical and Computional Thinking	Understand how to use angles in programming to create geometric shapes.	NA
	5	Programming	Loops	Python idle	Logical and Computional Thinking	Grasp why loops are used in programming to repeat a sequence of instructions.	NA
May	1	Project - Practical geometry	Geometrical spirograph	Python idle	Logical and Computional Thinking	Learn how mathematical concepts like angles and circles can be applied in programming.	NA
	2	Introduction to Arduino and IDE	Introduction to Arduino	Arduino Uno Tinkering Kit	Electronics and Creativity	Understand what Arduino is and its role in DIY electronics, robotics, and IoT (Internet of Things).	NA
	3	Project-Light	Led Chaser	Arduino Uno Tinkering Kit	Electronics and Creativity	1. Learn how to connect LEDs and resistors on a breadboard. 2. Learn about digital output and the delay() function to manage timing.	NA
	4		PTM SHOWCASE				
	5		SUMMER CAMP				
July	1	Revision of Arduino	Traffic Light	Arduino Uno Tinkering Kit	Electronics and Creativity	1. Learn how to connect LEDs and resistors on a breadboard. 2. Learn about digital output and the delay() function to manage timing.	
	2	Control statement	Led control with switch	Arduino Uno Tinkering Kit	Electronics and Creativity	1. Learn how switches can be used as digital inputs to control LEDs (digital outputs). 2. Grasp the concept of a pull-up or pull-down resistor and why it is necessary for stable button operation.	NA
	3	Introduction to Robotics	Ultrasonic sensor interfacing with Arduino	Arduino Uno Tinkering Kit	Electronics and Creativity	1. Learn about ultrasonic sensors, including how they work using sound waves to measure distance. 2. Develop programming skills to control the ultrasonic sensor using Arduino, particularly in sending ultrasonic pulses and measuring their reflection.	NA
	4	Types of movements	Understanding and using IR sensors with Arduino	Arduino Uno Tinkering Kit	Electronics and Creativity	Learn to write code to read the input from the IR sensor and perform an action (like turning an LED on/off).	NA
	5	Motion and Time	Servo Motor	Arduino Uno Tinkering Kit	Electronics and Creativity	1. Gain experience in connecting a servo motor to an Arduino, understanding the wiring for power, ground, and control signal. 2. Learn how to use the Arduino Servo library to manage servo movements.	NA
August	1	Project	Ultrasonic based Smart dustbin using Arduino-Servo	Arduino Uno Tinkering Kit	Electronics and Creativity	1. Learn about ultrasonic sensors, including how they work using sound waves to measure distance. 2. Develop programming skills to control the ultrasonic sensor using Arduino, particularly in sending ultrasonic pulses and measuring their reflection.	
	2	Robotics with Electronics	Integration of Arduino with Motor Driver	Robotics Tinkering Kit	Electro-Robotics & Logical Skills	Students learn about the basic principles of electronics, including voltage, current, resistance, and how these concepts apply to motor control circuits.	NA
	3	Robotics with Electronics	Integration of Motor Driver and Motors	Robotics Tinkering Kit	Electro-Robotics & Logical Skills	Students learn about different types of motors (DC, stepper, servo), their operating principles, construction, and characteristics such as torque, speed, and power consumption.	NA
	4	Robotics with Mechanical parts	Construction of Mechanical Assembly	Robotics Tinkering Kit	Electro-Robotics & Logical Skills	Students learn about various mechanical components used in robot construction, including frames, chassis, actuators, joints, gears, bearings, and fasteners. They understand the purpose and functionality of each component and how they contribute to the robot's overall structure and movement.	NA
September	1	Project	Fixing and Testing of Project Customised direction 2 WD Bot using Arduino	Robotics Tinkering Kit	Electro-Robotics & Logical Skills	Students develop the ability to identify and troubleshoot issues with the 2WD bot's hardware and software components. This involves systematically isolating problems, using diagnostic tools like multimeters or logic analyzers, and interpreting error messages from the Arduino IDE.	
	2	Introduction to Motor Driver	Integration of Arduino with Motor Driver	Robotics Tinkering Kit	Electro-Robotics & Logical Skills	Students gain a deeper understanding of how motors operate and the principles behind controlling their speed, direction, and torque. They learn about different types of motors (DC, stepper, servo) and their applications in robotics and automation.	NA
	3	Electronics	Integration of Motor Driver and Motors with sensors	Robotics Tinkering Kit	Electro-Robotics & Logical Skills	Students learn about different types of sensors used in robotics and automation, such as proximity sensors, encoders, accelerometers, gyroscopes, and infrared sensors. They understand the principles of operation, sensing mechanisms, and applications of each sensor type.	NA
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April	1	STEM Orientation					
	2	Mathematics	Python operators	Python idle	Logical and Computional Thinking	Familiarize with arithmetic, comparison, logical, assignment, and other types of operators in Python.	NA
	3	Programming	Conditional Statement	Python idle	Logical and Computional Thinking	1. Understand how to use if, elif (else if), and else statements to create conditions in Python. 2. Develop logical thinking skills by determining the conditions and actions in a program.	NA
	4	Project-Small Calculator	Python Functions	Python Programming Language	Logical and Computional Thinking	1. Learn how to define a function using the def keyword. 2. Understand how to call a function to execute the code it contains.	NA
	5	Project -Small Chatbot	Python Module	Python Programming Language	Logical and Computional Thinking	Python Turtle facilitates creative programming through visual drawing and graphics.	NA
May	1	Project Good Night Animation - 1	Good Night Animation - 1	Python Programming Language	Logical and Computional Thinking	Understand how to structure a program using functions to simplify the process of drawing complex shapes.	NA
	2	Project Good Night Animation - 2	Good Night Animation - 2	Python Programming Language	Logical and Computional Thinking	1. Learn how to combine these shapes to create a more complex "Good Night" scene. 2. Understand how to change the Turtle's attributes like its shape, color, and pen attributes.	NA
	3	Introduction to LCD	Introduction to LCD	Arduino Tinkering Kit	Engineering & Technological Skill	1. Gain basic knowledge about LCD displays, particularly character LCDs commonly used with Arduino. 2. Learn how to initialize the LCD and write code to display text.	NA
	4	PTM SHOWCASE					
	5	SUMMER CAMP					
July	1	Introduction to Arduino with LCD	IR sensor integration with LCD	Arduino Uno Tinkering Kit	Electronics and Creativity	1. Learn how IR sensors detect infrared light and how they are used in various applications. 2. Gain experience in setting up circuits on a breadboard with the IR sensor, Arduino, and other components.	
	2	Code for LCD	Code for LCD (Displaying a Message)	Arduino Tinkering Kit	Engineering & Technological Skill	1. Understand the purpose of various functions provided by the library, such as begin(), clear(), setCursor(), and print().	NA
	3	Sound Alert	Integration of Buzzer with LCD using Arduino	Arduino Tinkering Kit	Engineering & Technological Skill	1. Developing skills in writing code to control hardware components using Arduino's programming language. 2. Learning to connect and integrate different hardware components (buzzer) with Arduino, improving understanding of circuitry and electronics.	NA
	4	Project	Arduino based smart home security system	Arduino Tinkering Kit	Engineering & Technological Skill	1. Developing troubleshooting and debugging skills for code and hardware connections, transferable across domains. 2. Applying theoretical concepts to real-world engineering and technological scenarios for practical understanding.	NA
	5	Ultrasonic sensor	Introduction to Ultrasonic Sensors	Robotics Tinkering Kit	Problem Solving	1. Grasp the basic principle of how ultrasonic sensors work: transmitting a sound wave and receiving the echo to measure distance. 2. Learn the basics of connecting an ultrasonic sensor to a microcontroller like Arduino.	NA
August	1	Distance Display	Code to Display Distance on Serial Monitor	Robotics Tinkering Kit	Problem Solving	Develop skills in writing code to control ultrasonic sensors, including initiating a pulse and measuring the response time.	
	2	Motion and Time	Servo Motor	Robotics Tinkering Kit	Problem Solving	1. Gain experience in connecting a servo motor to an Arduino, understanding the wiring for power, ground, and control signal. 2. Learn how to use the Arduino Servo library to manage servo movements.	NA
	3	Electronics	Integration of Motor Driver and Motors with sensors	Robotics Tinkering Kit	Problem Solving	Students gain proficiency in interfacing sensors with microcontrollers like Arduino. They understand how to connect sensors to the appropriate input pins, read sensor data using analog or digital interfaces, and process sensor readings in software.	NA
	4	Robotics assembly	Construction of Mechanical Assembly integration with electronics	Robotics Tinkering Kit	Problem Solving	Students grasp foundational electronics concepts including voltage, current, resistance, and power. They understand how electronic components such as microcontrollers, sensors, motor drivers, and power supplies operate within a circuit.	NA
September	1	Project	Autonomous Obstacle Avoidance Robot	Robotics Tinkering Kit	Problem Solving	Students learn fundamental principles of robotics, including locomotion, sensing, decision-making, and actuation. They understand how these principles apply to the design and operation of autonomous robots.	
	2						NA
	3						NA
	4						NA
	5						NA

Month	Sessions	Topic	Activity	Kits	Skills	Learning Outcome	Teacher Mannual
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April	1	STEM Orientation					
	2	Introduction to Statistics and Data	Data Visulazation	Python and Jupyter Notebook	Analytical and Mathematical	1. Understand the importance and purpose of data visualization in interpreting and communicating data insights. 2. Learn about different types of data (categorical, numerical, time series, etc.) and how they influence the choice of visualization.	NA
	3	Introduction to matplotlib	Introduction to matplotlib	Python and Jupyter Notebook	Analytical and Mathematical	1.Gain a basic understanding of what Matplotlib is and its role in data visualization. 2. Understand the integration of Matplotlib with data manipulation libraries like Pandas and NumPy.	NA
	4	Mean Median Mode	Mean	Python and Jupyter Notebook	Analytical and Mathematical	Learn how to calculate the mean (average).	NA
	5	Mean Median Mode	Median Mode	Python and Jupyter Notebook	Analytical and Mathematical	Learn how to calculate the median and mode of a data set.	NA
May	1	Range	Range	Python and Jupyter Notebook	Analytical and Mathematical	1. Range, variance, and standard deviation. 2. Calculation of variance and standard deviation. 3. Introduction to Matplotlib's histogram for data representation.	NA
	2	Bar graph-Project	Bar graph	Python and Jupyter Notebook	Analytical and Mathematical	1. Learn the difference between bar graphs and other chart types like histograms and line graphs. 2. Identify and understand the key components of a bar graph, including the title, axis labels, bars, and scales.	NA
	3	Histogram - Project	Histogram	Python and Jupyter Notebook	Analytical and Mathematical	1. Grasp the basic concept and purpose of a histogram in data representation. 2. Develop skills to interpret histograms, understanding how they display data distribution, central tendency, and variability.	NA
	4	Pie chart - Project	Pie chart	Python and Jupyter Notebook	Analytical and Mathematical	1. Learn about the suitability of pie charts for different types of data. 2. Learn the steps involved in creating a pie chart, from data selection to plotting.	NA
	4	ALL Graph - Project	All graphs for same data	Python and Jupyter Notebook	Analytical and Mathematical	1. Learn about the Development of All charts for Same value of data. 2. Learn the steps involved in creating Charts, from data selection.	NA
			PTM SHOWCASE				
July	1	Electromagnetic Switch	Relay Introduction & Integration	Arduino Tinkering Kit	Engineering & Technological Skill	Students learn about the fundamental principles of relay operation, including electromagnetism, coil energization, and mechanical switching. They understand how relays act as electrically operated switches, controlling high-power circuits using low-power control signals.	
	2	Switching Concept	Integration of LEDs with relay	Arduino Tinkering Kit	Engineering & Technological Skill	Students deepen their understanding of relay operation by exploring how relays can be used to switch high-power loads such as LEDs. They learn about the coil, contacts, and the switching mechanism within the relay.	NA
	3	Coding with Hardware	Code for Controlling Relay using Arduino	Arduino Tinkering Kit	Engineering & Technological Skill	Students learn how to use digital output pins on the Arduino board to control external devices such as relays. They understand the concept of digital output, where the Arduino can set a pin to either HIGH (5V) or LOW (0V) to control the state of the relay.	NA
	4	Technology Communication	Introduction to Communication	Arduino Tinkering Kit	Engineering & Technological Skill	students learn about digital communication channels such as email, social media, instant messaging, and video conferencing. They understand how to adapt communication strategies for different digital platforms and audiences.	NA
	5	Technology Communication	Code for Bluetooth Communication	Arduino Tinkering Kit	Engineering & Technological Skill	Students learn about Bluetooth as a wireless communication protocol and its application in connecting devices over short distances. They understand the principles of serial communication and how Bluetooth enables data exchange between devices.	NA
August	1	Project	Home Automation using arduino and bluetooth communication	Arduino Tinkering Kit	Engineering & Technological Skill	Students learn about the principles and concepts of home automation, including remote control, scheduling, energy efficiency, and convenience.	
	2		IR Sensor	Robotics Tinkering Kit	Problem Solving	1. Learn how IR sensors detect infrared light and how they are used in various applications. 2. Gain experience in setting up circuits on a breadboard with the IR sensor, Arduino, and other components.	NA
	3		Code for IR Sensor and Motor Driver	Robotics Tinkering Kit	Problem Solving		NA
	4		Construction of Robot Assembly	Robotics Tinkering Kit	Problem Solving		NA
September	1	Project	IR Array based Line follower Robot	Robotics Tinkering Kit	Problem Solving		
	2	Project Assessment	Project Report , Presentation				
			Half Yearly				