STEM Innovation Lab | Curriculum 2027-28 : Annual Plan

Jr. KG

Tiny Inventors | Explore • Build • Discover

Module No.	Module Name	Topics	Capstone Project
Module 1	Electronics Explorers	• Introduction to electricity and battery-operated objects • Exploring light through LEDs and switches • Discovering how electricity creates sound using buzzers • Understanding movement through motors and propellers • Observing how electrical components help things work	My Smart Town Children create and decorate a mini project using light, sound, or movement (traffic signal, fan, alarm, etc.) and explain how it works.
Module 2	Coding Without Computers	• Understanding coding as giving and following instructions Giving and following instructions • Sequencing and arranging steps in order • Understanding directions: forward, backward, left, right • Creating simple flowcharts and instruction paths • Identifying and making repeating patterns (loops)	Maze Adventure Challenge Children guide a friend through a floor maze using coding instruction cards and directional commands.
Module 3	My First Robotics Adventure	• Meeting robots and understanding their role in daily life • Learning how robots move and follow commands • Using directional controls to guide robots • Exploring movement through pushing, pulling, rolling, and spinning • Solving simple challenges with robots	My Robot Adventure Children guide a robot through an obstacle path and present what their robot can do.
Module 4	Flying Machines & Aerodynamics	• Discovering how air helps objects move • Folding and testing paper airplanes • Identifying parts of an airplane (wings, tail, fuselage) • Comparing paper and wooden aircraft • Exploring air resistance through parachutes	Junior Pilot Showcase Children display their paper plane or parachute and share one observation about how it flies or falls.
Module 5	Little Engineers at Work	• Who are engineers and what do they build? • Drawing and planning simple structures • Building towers and exploring balance • Constructing bridges and testing strength • Investigating ramps, slopes, and rolling movement	Engineering Expo Children present their strongest structure, bridge, or ramp model and explain how they built it.

Sr. KG

Young Engineers | Plan • Test • Create

Module No.	Module Name	Topics	Capstone Project
Module 1	Electronics Explorers	• Exploring LEDs, batteries, and switches • Understanding how resistors control electricity flow • Discovering how capacitors store and release energy • Investigating motor movement and direction changes • Designing and testing simple circuits	My Circuit Creation Children build and present a working circuit using light, movement, or stored energy and explain how the components work together.
Module 2	Coding Without Computers	• Understanding algorithms as step-by-step instructions • Sequencing everyday activities and recipes • Giving and following directional coding commands • Exploring patterns, loops, and repetition • Creating movement-based coding challenges	Code Masters Challenge Children design and lead a coding pathway game using directional instruction cards and algorithms.
Module 3	Junior Robotics Engineers	• Exploring robot parts and their functions • Planning movement sequences before programming • Identifying and correcting errors (debugging) • Testing robots on different surfaces and slopes • Creating movement plans and obstacle challenges	Robot Mission Control Children create a robot program sheet, guide their robot through an obstacle course, and explain their sequence of commands.
Module 4	Flight, Rockets & Aerodynamics	• Understanding how air helps objects move and fly • Designing advanced paper airplanes and rockets • Exploring glider construction and balance • Comparing flight performance of different aircraft • Investigating propulsion and launch systems	Aviation & Rocket Expo Children demonstrate their best-performing plane, glider, or rocket and share their flight observations.
Module 5	Engineering Design Challenge	• Understanding the Engineering Design Process (Plan–Build–Test–Improve) • Creating engineering drawings before construction • Exploring strong and weak structures • Testing ramps and recording observations • Designing structures to solve real-world problems	Mini City Engineering Showcase Children design and build a mini city featuring towers, bridges, roads, and ramps, presenting how their structures were planned and constructed.

Grade 1

The Curious Maker | Gadgets, Games & Simple Machines

Module No.	Module Name	Topics	Capstone Project
Module 1	3D Pen	• Understand the safe usage of 3D pen to create accurate 2d geometric shapes,transform 2D letters and Emojis into free standing 3D forms using layering.They will apply these skills to design creative 3D models that integrate art and design thinking.	3D Nametag for Friendship Day
Module 2	Electronics	• Understand basic components of electronics, build simple circuits to blink and power LED's, apply conductors and insulators in paper circuits, and Play-Doh models, and combine them effectively to show the concepts of open and closed circuits using E-greeting cards.	E greeting cards using LEDs
Module 3	Robotics	• Understand the components of Robotics kit, apply motors and sensors to add motion and logic to circuits.They will understand enegy conversion from one form to another. They will verify the same by making a movable toy car.	Simple Toy car
Module 4	Robotics	• Understand the working and application of different sensors like light, moisture and obstacle sensors to create practical automation projects.	Automatic morning alarm
Module 5	Coding	• Understand Blockbased coding, to build interactive stories and games by working with Sprites, Events, Motion, Sensing and control blocks and by creating variables to manage scores .	Pingpong game

Grade 2

The Junior Builder | Playful Tech & Robo Challenges

Module No.	Module Name	Topics	Capstone Project
Module 1	3D Pen	• Understand the basics of using a 3D pen. Students learn how to turn 2D shaped into 3D, using the added dimension of height. They explore shapes like triangles and curves which objects a 3D appearance.	Park tour
Module 2	Electronics	• Understand basic electronics concepts and components, explore conductors /insulators and static energy, and build open/closed circuits to power simple devices like LEDs	Light up Play-Dough creatures
Module 3	Robotics	• Understanding the concepts of robotics, Understand simple mechanical concepts like wheels, gears, and levers. Learn how these components help robots move and function.	Spin the Wheel Game
Module 4	Robotics	• Understand the concept of sensor modules, design and build light-controlled machines, to understand sensor-based automation, implement obstacle detection principles to create Obstacle detection Robot	Obstacle detection Robot
Module 5	Coding	• Understanding block based programming language, Event blocks, Looks block, Control statements, loops, sequencing and instructions	Maze Game in Scratch

Grade 3

The Robotics Explorer | Smart Circuits & Creative Coding

Module No.	Module Name	Topics	Capstone Project
Module 1	3D Pen	• Understand the basics of the 3D pen, its safe usage, and create data-based 3D models of Planets to explore solar system features. They will also design superhero models with distinctive costumes. They will design a playground by modeling key components to showcase spatial ideas	From Space to Superheroes
Module 2	Electronics	• Understand different electronic components, such as Resistance, LDR, and Capacitor. How Capacitors store and release energywhile building capacitor based projects	Charge-storing device using Capacitors
Module 3	Robotics	• Understand the components of Robotic kits,understand the functioning of T-3 motors to add motion to the projects,learn what sensors are and how they react to light, sound and may more Inputs. They will understand the importance of Copy Module and will be	Smart automated house
Module 4	Robotics	• Understand the concept of NOT logic gate,understand the concept of light sensor and explore the need to save electricity. They will also use moisture sensorand will utilise the same knowledgein making a overflow water Alarm.	Overflow Water Alarm
Module 5	Coding	• Understand the meaning and key components of problem-solving using Scratch. They will learn the sprite coordinate system, Events and Conditional blocks, and build scripts that make sprites respond to user interactions	Animated Story with Music and Sound Effects

Grade 4

The Systems Explorer | Sensors, Signals & Smart Robots

Module No.	Module Name	Topics	Capstone Project
Module 1	3D Pen	• Understand working of 3D pen ,will create an artistic display of multiplcation circle by connectingnumbered dots as per the table. They will also make miniature cricket bat and ball.	3D Sports Miniature Arena
Module 2	Electronics	• Understand the source of electricity,analyze the behaviour of series and parallel circuits.they will utilize the concepts in making Electric Quiz game	Electric Quiz Game
Module 3	Robotics	• Understand the Physical Computing and sensor modules,student will explore creating real world applications like Clap switch,conductivity tester and obstacle detection	Car parking Assistance device
Module 4	Robotics	• Understand about concept of obstacle detectionand tto makean obstacle avoiding robot to navigate around barriers. They will also assemble and program a line following robot to track and follow a path	Line following Robot
Module 5	Coding	• Understand the mBlock programming module to develop narrative and sequencing skills through block-based coding. They will also learn to apply conditional if-else statements to build logical and interactive games and apps	Human Recognition Model

Grade 5

The IoT Explorer | 3D Design, IoT & AI Basics

Module No.	Module Name	Topics	Capstone Project
Module 1	3D Printer & 3D Design	• Understanding 3D design using Autodesk Tinkercad Create a 3D planet Adding rings to our 3D planet and printing it Understanding hollow shapes and creating our own cup	3D Pencil Holder
Module 2	Electronics	• What is Electricity? Understanding Power Sources • How does a battery work? Undersanding Switches Series and Parallel Circuits	Diwali lights
Module 3	Robotics	• Understand the concept of light intensity and its measurement. • Develop programming skills to make the robot follow a specific path.	Dry Soil alarm
Module 4	Robotics	• Understand pendulum motion, RGB colour mixing, and persistence of vision, then apply motors, sensors, Wi-Fi, and app coding to create delivery bots, proximity alarms, light-sensing curtain bots, and remote-controlled robots.	Automatic curtains opening using LDR
Module 5	AI/ML & IoT (Coding)	• Introduction to AI/ML, Understanding the concept of AI/ML	Weather Forecasting

Grade 6

The Automation Explorer | Logic, Automation & Smart Assistants

Module No.	Module Name	Topics	Capstone Project
Module 1	3D Printer & 3D Design	• Understanding 3D design using Autodesk Tinkercad • They will create a 3D dice and will print the first object. They will understand Snap-grid and create their own mini-ruler!	Game with Rolling Dice
Module 2	Electronics	• Understand importance of logic gates (AND, OR and NOT). They will implement the same logic to demonstrate the inversion operation. They will also be making a logical game for verifying AND gate conditions	Game with digital gates
Module 3	Robotics	• Understand Net logic microcontroller to turn on a light, explain the function and working of obstacle and light sensors, and apply threshold conditions to design safety systems	Smart Toy Car Remote controlled
Module 4	Robotics	• Understand Net logic and other cretile modules with obstacle,light and moisture sensor to build system like safety alerts and and app and wi fi controlled robot to solve real world challenges	Sweep Bot
Module 5	AI/ML & IoT (Coding)	• Understand AI and ML basics,explore data,pattern recognition and apply supervised learning concepts using Teachable and mBlock to see how machine learn from examples and make decisions	Smart personal assistant

Grade 7

The Data Explorer | Arduino, Python & AI Prediction

Module No.	Module Name	Topics	Capstone Project
Module 1	Electronics	• Understand the concept of Arduino, its programming, attaching analog & digital sensors and making projects after uploading the program to the microcontroller	Height measuring device
Module 2	Coding	• Understanding Python Programming by learning the basics of Python, Loops, data types, Inputs and outputs in Python.	Guess my prime number program
Module 3	Robotics	• Understand the basiccomponents of robots: sensors, actuators, controllers. Learn about different types of robots and their applications. Understand how sensor data can be used to control a robot's movement.	Child Safety Alarm
Module 4	Robotics	• Understand Netlogic and cretile modules along with knowledge of different sensors to build alert systems, path following, light tracking, and line following bots.They will use the concepts to solve real world problems in homes,factories,elevatorsand emergency scenarios	Overweight Elevator Alarm
Module 5	AI/ML	• Understand how to use Python, Jupyter Notebook, Pandas, and Matplotlib for data collection, processing, and visualization. They will create linear and logistic Regression models for prediction models.	Temperature predictor model/ Sentiment Analyzer

Grade 8

The Smart Systems Builder | Smart Devices & AI Models

Module No.	Module Name	Topics	Capstone Project
Module 1	Electronics	• Understand the concept of Arduino, its programming, attaching analog & digital sensors and making projects after uploading the program to the microcontroller	Anti theft alarm
Module 2	Coding	• Python Game designing Text based	Random Number Generator Game
Module 3	Robotics	• Understand and create app-controlled systems like water dispensers, car parking meters, using pump motors, obstacle sensors, and MIT App Inventor	Smart Water Dispenser
Module 4	Robotics	• Understand the basic parts of a robotics kit: sensors, actuators, microcontrollers, and power sources. Learn how to assemble and connect these components correctly. Write simple programs to interact with sensors and actuators.	Smart door lock
Module 5	AI/ML	• Understand how to write Python programs, use Jupyter Notebook, Pandas,Numpy and Matplotlib for data collection, processing, and visualization. They will create linear and logistic Regression models for prediction models .They will also learn unsupervised clustering models .	Flower Species classification model

Grade 9

The AI Systems Innovator | AI, Robotics & Future Tech

Module No.	Module Name	Topics	Capstone Project
Module 1	AI with Coding	• Understanding what is Machine Learning, Neural Networks, NLP, and Computer Vision. Learning Definition of AI, historical milestones, key figures.	AI Model for a Smart School
Module 2	AI and Robotics	• Understanding the concept of Robotics and • the role of AI in Robotics	AI System for Managing Crowd at a School Fair/gesture based lamp intensity control
Module 3	Future Tech	• Introduction to the basic concept of flying, create different paper flying models, Assemble the kit of drone, with simple programming platform program a drone, fly a drone	Theft Avoidance/Surveillance Bot