

PI CODE CLUB

Syllabus

Of

Coding, Robotics, A.I and ICT



MAVERICK DEN

Think 'n' Do



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Foreword

I What is Coding?

Learning and doing programming is an exercise for your brain that eventually improves your problem-solving and logical ability. Learning to code will teach you to understand this world, to solve the problems we encounter every day in our life

1. Computer programming promotes logical thinking
2. Learning to code helps a students' creativity
3. When students learn to code they develop persistence
4. Coding helps to develop resilience
5. Learning to code can improve a child's communication skills
6. Children improve their structural thinking when learning to code
7. Coding helps children with problem-solving
8. Coding improves students' math skills
9. Coding helps kids learn to learn
10. Coding is The Most Important Skill You Need in the 21st Century

II What is Robotics

In simplified language, a robot is a programmable machine or a gadget automated to follow input commands or a set of instructions to reduce human tasks. Robots consist of sensors and processing units that help them perceive their environment, and the actuators and motors help them to move their legs and limbs.

Artificial Intelligence (AI) and technology are only going to increase in specifications and features skillset as time passes.

- Robotics Facilitates STEM Learning
- Robotics Enhances Creativity and Problem-solving Skills



- Robotics is for the Future Employment
- Robotics Teaches Science and Math Concepts
- Robotics Paves Way for Programming
- Robotics Improves Self Confidence
- Robotics Instills Teamwork and Collaboration
- Robotics is Fun

III Computer Education

Computer education in schools plays an important role in students' career development. A computer with the internet is the most powerful device that students can use to learn new skills and a more advanced version of current lessons. Universities & Schools are around the globe teaching student's basics of computers and the internet online and offline.

1. Word processing, PPT, Excel Skills
2. Social Media dos and don'ts
3. vlog, blogging, and content writing
4. WordPress Website Designing Skills
5. Internet Research
6. Data and Information Management or Privacy and protection skills
7. Spam and hacking issues

Coding syllabus

Standard 1st & 2nd		
Lesson plan	Learning	Projects
<p>Lesson 1: introducing scratch jr. And creating character</p> <ul style="list-style-type: none"> ● Introduction to characters ● Select new character ● Move character ● right • left • up • down ● bigger • smaller • ● visible • invisible <p>Lesson 2: some more programming blocks</p> <ul style="list-style-type: none"> ● Jump ● Go home ● Reset size ● Turn clockwise ● Turn counterclockwise ● Start program using green flag <p>Stop program using end block</p> <p>Lesson 3: background</p> <ul style="list-style-type: none"> ● Choosing background ● Creating own background 	<ul style="list-style-type: none"> ● Introduction to block coding ● Sequencing instructions ● Movement of character <ul style="list-style-type: none"> ● Size and shapes ● Colors ● Directions (left, right, up, down, clockwise, anticlockwise) <ul style="list-style-type: none"> ● Painting using paint tool 	<p>Project 1: make your sprite move</p> <p>Project 2: make your sprite change size, color, move in different directions</p> <p>Project 3 : change the background of your program, draw a background</p>

<p>Lesson 4: speed</p> <ul style="list-style-type: none"> • Change speed of the character • Different speed for different characters <p>Lesson 5: numbers and repeating sequences</p> <ul style="list-style-type: none"> • Numbers can be used on motion blocks • Numbers can reduce the number of blocks needed • Programs can be repeated for a specified number of times • Programs can be repeated forever <p>Lesson 6: speech and sound</p> <ul style="list-style-type: none"> • Speech bundle • Add voice to the character • Add a speech bubble to the character • Change page./ screen 	<ul style="list-style-type: none"> • Speed and motion • Repeating the action • Loop • Speech • Sound 	<p>Project 4: make your sprite to move/glide</p> <p>Project 5: make your sprite to repeat its action.</p> <p>Project 6: add a speech bubble to your character</p>
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<p>Lesson 7: creating a story - introduction</p> <ul style="list-style-type: none"> ● Creating characters of story ● Creating background of story ● Creating script of the story 	<ul style="list-style-type: none"> ● Graphical representation ● Flow control process 	<p>Project 7: create a story with a sprite and background</p>
<p>Lesson 8: Create a story with a single character</p> <ul style="list-style-type: none"> ● Creating character ● Creating background ● Script ● Speech bubble ● Sound ● Motion 	<ul style="list-style-type: none"> ● Graphical representation ● Flow control process 	<p>Project 8: create a story with a sprite and background</p>
<p>Lesson 9: Create a story with multiple characters</p> <ul style="list-style-type: none"> ● Creating character ● Creating background ● Script for different characters ● Speech bubble ● Sound ● Motion 	<ul style="list-style-type: none"> ● Wait statement ● Loop ● Sequencing 	<p>Project 9: create a story with multiple sprites</p>
<p>Lesson 10: creating a story with multiple characters, multiple stages</p> <ul style="list-style-type: none"> ● Creating characters 	<ul style="list-style-type: none"> ● Sequencing ● While loop ● Conditional statement 	<p>Project 10: create a story with multiple sprites and multiple backgrounds</p>

<ul style="list-style-type: none">• Creating background multiple• Script for different characters• Speech bubble• Sound• Motion• Changing backgrounds		
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Standard 3rd & 4 th		
Lesson plan	Learning	Projects
<p>Chapter 1: introducing scratch and creating sprite</p> <ul style="list-style-type: none"> • First look at scratch • Introduction to sprite • Select sprite • Move direction <p>left-right</p> <ul style="list-style-type: none"> • Introduction to the stage, surface area, etc. • Say hello 	<ul style="list-style-type: none"> • Introduction to block coding • Sequencing instructions • Movement of character • Directions (left, right, up, down, clockwise, anticlockwise) 	<p>Project 1: create your sprite and move in different directions</p>
<p>Chapter 2. Create your own sprite with costumes</p> <ul style="list-style-type: none"> • Design sprite • Back, left side, and right side views • Change costume 	<ul style="list-style-type: none"> • Painting using paint tool • Costume – different appearances of sprite 	<p>Project 2: design your own sprite with different costumes</p>
<p>Chapter 3. Dancing sprite with costume</p> <ul style="list-style-type: none"> • Make sprite to dance • Controls 	<ul style="list-style-type: none"> • Repeating the action • Loop 	<p>Project 3 -rock band project</p>
<p>Chapter 4. Create a scene from scratch</p> <ul style="list-style-type: none"> • Create a simple scene • Add simple movement scripts to sprite 	<ul style="list-style-type: none"> • While loop • If else statement • Gui 	<p>Project 4 - donut and donut man</p>

<p>Chapter 5 - animate your name</p> <ul style="list-style-type: none"> • Write your name/message • Put animation • Put sound • Put background 	<ul style="list-style-type: none"> • Animation • Speech 	<p>Project 5- make a greeting card</p>
<p>Chapter 6 - sound</p> <ul style="list-style-type: none"> • Add voice to the character • Add speech bubble to character • Change page./ screen 	<ul style="list-style-type: none"> • Sound • Conditional statement • Logical operation • Algorithm 	<p>Project 6- make a greeting card</p>
<p>Chapter 7 if-else condition</p> <ul style="list-style-type: none"> • Put if else condition in program 	<ul style="list-style-type: none"> • Conditional statement • Logical operation • If else statement • Distance 	<p>Project 7 - chatbot</p>
<p>Chapter 8 look bigger/smaller</p> <ul style="list-style-type: none"> • Show sprite bigger/smaller • Show sprite near or far <p>Chapter 9 control with event bar/entre</p> <ul style="list-style-type: none"> • Control by clicking flag • Control by space bar/entre • Control by shooting message 	<ul style="list-style-type: none"> • Looks and event blocks • Control • Loops • Logical operations 	<p>Project 8 – create a story</p> <p>Project 9 – create a story With multiple stages</p>

<p>Chapter 10 sensing</p> <ul style="list-style-type: none"> • Sensing mouse pointer • Sensing particular color • Sensing particular object • Set a timer and reset timer 	<ul style="list-style-type: none"> • Sensing command • Conditional statements • Programming multiple sprites 	<p>Project 10 - ghost game</p>
<p>Chapter 11 variable</p> <ul style="list-style-type: none"> • Set variable • Change variable on specific event • Make scoreboard for game 	<ul style="list-style-type: none"> • Mathematical operations • Variables • Sensing command 	<p>Project 11 - ghost game with scoreboard</p> <p>Project 12 - dodge ball game</p>

Standard 5th & 6 th		
Html lesson plan	Learning	Projects
<p>Lesson 1: coding basics: intro to HTML syntax</p> <p>The HTML, head, title, & body tag Headline, paragraph and list The strong em tag The doctype The lang attribute The meta tag & the Unicode character set</p>	<ul style="list-style-type: none"> ● Line coding ● Paragraph formatting using programming 	<p>Project: make your own webpage</p>
<p>Lesson 2 coding links: absolute & relative URLs</p> <ul style="list-style-type: none"> ● anchor tags & hrefs ● linking to other websites ● linking to pages within a website ● opening a link in a new browser window/tab 	<ul style="list-style-type: none"> ● Hyperlinks on website ● Redirection 	<p>Project: add hyperlinks of another website to your webpage</p>
<p>Lesson 3: adding images</p> <ul style="list-style-type: none"> ● the break tag ● the image tag & source attribute ● using the width, height, & alt attribute ● using horizontal rules 	<ul style="list-style-type: none"> ● Media files using HTML 	<p>Project: add media file to your webpage</p>
<p>Lesson 4: intro to cascading style sheets (css)</p>	<ul style="list-style-type: none"> ● Tags 	<p>Project: add tags to your webpage</p>

<ul style="list-style-type: none">• the style tag• selectors• the font-size, font-family, color, & line-height properties hexadecimal color codes		
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Standard 7th & 8 th		
Html/CSS lesson plan	Learning	Projects
<p>Lesson 5: CSS class selectors</p> <ul style="list-style-type: none"> the class attribute CSS class selectors the span tag CSS opacity <p>Lesson 6: div tags, id selectors, & basic page formatting</p> <ul style="list-style-type: none"> dividing up content with the div assigning ids to divs setting width & max-width CSS background-color adding padding inside a centering content CSS borders CSS shorthand & the dry <p>Lesson 7: using browser developer tools</p> <ul style="list-style-type: none"> opening the dev tools in chrome editing HTML in the dev tools elements panel enabling, disabling, & editing CSS in the dev tool using dev tools to fine-tune your CSS hexadecimal shorthand <p>Lesson 8: html5 semantic elements & validating HTML</p> <ul style="list-style-type: none"> the outline algorithm 	<ul style="list-style-type: none"> Css Class Auto numbers Page formatting of website Browser dev tools Semantic elements Html validation 	

<ul style="list-style-type: none">● the header, nav, aside, & footer elements● understanding articles & sections● the main element● the figure & fig caption elements● checking for errors: validating your code		
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Standard 9th & 10th		
Python lesson plan	Learnings	Projects
<ol style="list-style-type: none"> 1. Python condition statement 2. Python for while loop 3. Break continue, pass statement <p>Python string</p> <ol style="list-style-type: none"> 1. String 2. String strip() function 3. String count() 4. N string format() 5. N string len() method 6. String find() method <p>Python functions</p> <ol style="list-style-type: none"> 1. Python main function & method example 2. Python functions examples 3. Lambda functions in python 4. Python abs() function 5. Python round() function 6. Python range() function 7. Python map() function 8. Python timeit() with examples 9. Yield in python tutorial 10. Python queue 11. Python counter in collections 12. Enumerate() function in python 13. Python time.sleep() 	<ul style="list-style-type: none"> • If..else • Elseif • Switch cases • Learn with examples <ul style="list-style-type: none"> • Replace, join, split, reverse, uppercase & lowercase • What is string • Examples <ul style="list-style-type: none"> • Call, indentation, arguments & return • Python lambda functions with exam • Absolute value • Float, list, for-loop examples • Loop, tuple, string 	

Robotics syllabus

Standard 1st & 2nd		
Mav. bits lesson plan	Learnings	Diy projects
<p>Project 1: glowing LED with battery</p> <ul style="list-style-type: none"> Principles of LED Current flow Glowing LED with battery 	<ul style="list-style-type: none"> Electric current Flow of electricity 	<p>Project 1: making LED lamp</p> <p>Project 1.2: making torch</p>
<p>Project 2: operating dc motor</p> <ul style="list-style-type: none"> What is motor Connecting motors to battery Rotating motors clockwise Rotating motors anticlockwise 	<ul style="list-style-type: none"> Working of motor Rotation Clockwise/anticlockwise 	<p>Project 2: making fan with on /off button</p>
<p>Project 3: speaker</p> <ul style="list-style-type: none"> What is speaker Connecting speaker with battery 	<ul style="list-style-type: none"> Sound Speaker 	<p>Project 3: greeting card with aluminum foil</p>
<p>Project 4: switches</p> <ul style="list-style-type: none"> What is switch 	<ul style="list-style-type: none"> Flow of electricity Working of switch/button 	<p>Project 4: toy car with RGB LED</p>

<ul style="list-style-type: none"> ● Putting switch with LED ● Putting switch with motor ● Putting switch with speaker <p>Project 5: RGB - LED</p> <ul style="list-style-type: none"> ● Concept of RGB LED ● Connecting RGB LED with battery ● Showing 3 colors of RGB LED with battery <p>Project 6: complex circuits</p> <ul style="list-style-type: none"> ● Connecting 2 or 3 components at a time with battery ● Speaker-LED ● Speaker-LED-motor ● Switch-speaker-LED ● Switch-speaker-LED-motors 	<ul style="list-style-type: none"> ● Colors ● Formation of color <ul style="list-style-type: none"> ● Multiple terminals ● Flow of electricity ● Voltage ● Power 	<p>Project 5: toy car with different components</p>
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Standard 3rd & 4th		
Mav. bits lesson plan	Learning	Diy projects
<p>Project 1 to 6 as per 1st and 2nd std</p> <p>Project 7: resister</p> <ul style="list-style-type: none"> ● Flow of current (voltage) ● Concept of resisters (to control voltage) ● Use of resister in LED ● Using different resisters <p>Project 8: potentiometer</p> <ul style="list-style-type: none"> ● Concept of potentiometer ● Control speed of fan by potentiometer ● Control brightness of light with potentiometer <p>Project 9: complex circuits</p> <ul style="list-style-type: none"> ● LED speaker with potentiometer ● LED fan with potentiometer ● 2 LEDs with potentiometer 	<ul style="list-style-type: none"> ● Voltage ● Resistance ● Controlling voltage ● Speed ● Brightness ● Patellar circuit ● Serial circuit 	<p>Project 1: mouse car/tin car/any car out of waste</p> <p>Project 2: house lighting with RGB LED</p> <p>Project 3: brush cleaner</p> <p>Project 4: table fan with potentiometer</p>

Standard 5 th & 6 th Mav bits project 1 - 9th		
Ardu block and mav-board lesson plan	Learnings	Diy projects
<p>Chapter 1 LED with ardu block</p> <ul style="list-style-type: none"> • Coding with ardu-block to blink LED • Increase/decrease wait time <p>Chapter 2 LED with button</p> <ul style="list-style-type: none"> • Concept of Button • Coding with ardu block to on and off LED <p>Chapter 3: LED with potentiometer</p> <ul style="list-style-type: none"> • Concept of potentiometer • Increase and decrease resistance with potentiometer • Control brightness of LED with potentiometer <p>Chapter 4: tone generator</p> <ul style="list-style-type: none"> • What is Buzzer? • Coding with Ardublock • Generating different tones 	<ul style="list-style-type: none"> • Controlling hardware with software • Wait statement and effect on hardware • Controlling power by programming • Measure voltage • Controlling voltage by programming • Sound • Pitch of sound • Voltage and pitch of sound 	<p>Project 1: blinking 4 LED in a pattern</p> <p>Project 2: control all LEDs with button</p> <p>Project 3: control brightness of all LEDs' with potentiometer</p> <p>Project 4: generate a tone</p>

<p>Chapter 5: RGB LED</p> <ul style="list-style-type: none"> ● Concept of RGB LED ● Coding with Ardublock for showing different colors <p>Chapter 6: RGB with button</p> <ul style="list-style-type: none"> ● Coding with Ardublock to show different colors with the press of button <p>Chapter 7: RGB with potentiometer</p> <ul style="list-style-type: none"> ● Coding with Ardublock to show different colors with the change of resistance by potentiometer <p>Chapter 8: buzzer with button</p> <ul style="list-style-type: none"> ● Coding with Ardublock for producing sound on click of the button 	<ul style="list-style-type: none"> ● Relation of color and voltage ● Controlling colors of RGB with programming ● Controlling the power of RGB with programming ● Controlling voltage of RGB with programming ● Controlling pitch of sound with programming 	<p>Project 5: create RGB LED pattern with a delay of 3 sec</p> <p>Project 6: create RGB LED pattern on click of button</p> <p>Project 7: create RGB LED colors with potentiometer</p> <p>Project 8: piano with arduino</p>
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Standard 7 th and 8 th Mav bits project 1 - 9th		
Ardublock and mav-board lesson plan	Learning	Diy projects
<p>Chapter 1 to 5 from std 6th</p> <p>Chapter 6 distance measurement using ultrasonic sensor</p> <ul style="list-style-type: none"> • Ultrasonic principle • Ultrasonic sensor and its working • Connecting ultrasonic sensor with mav board • Coding with Ardublock to measure distance from ultrasonic sensor to certain object <p>Chapter 7 : security system</p> <ul style="list-style-type: none"> • Connecting ultrasonic and buzzer with mav-board • Coding with Ardublock to on buzzer when object/person comes at certain distance <p>Chapter 8: tilt sensor</p> <ul style="list-style-type: none"> • Connecting tilt sensor with mav-board • Coding with Ardublock to show the degree of tilt 	<ul style="list-style-type: none"> • Working of LCD • Controlling LCD with programming • Ultrasonic principal • Working of ultrasonic waves and ultrasonic sensor • Distance and time relationship • Concept of gravity and gravitational force • Degree/angle • Temperature • Humidity • Relation of temperature and humidity 	<p>Project : display your name on LCD</p> <p>Project : measure distance of an object from a point</p> <p>Project : display distance of an object from a point</p> <p>Project : make security alarm with LED</p>

<p>Chapter 9: temperature and humidity sensor</p> <ul style="list-style-type: none"> • Connecting temperature and humidity sensor what mav-board • Coding with Ardublock to show the current temperature and humidity 	<ul style="list-style-type: none"> • LDR and its working 	<p>Project: measure angles with sensor</p>
<p>Chapter 10: LED with LDR</p> <ul style="list-style-type: none"> • Concept of LDR • Connecting LED and LDR with mav-board • Coding with Ardublock to off LED when exposed to light and vice versa 	<ul style="list-style-type: none"> • Working of motors • Controlling motors with sensor • Distance • Angle 	<p>Project: measure current temperature and humidity</p>
<p>Project 11: ultrasonic bot:</p> <ul style="list-style-type: none"> • Principles of ultrasonic sensor • Using ultrasonic sensors with motors, Arduino, etc. • Making the bot by coding as obstacle avoider 		<p>Project: street lamp project</p> <p>Project: edge detector bot</p>

Standard 9th and 10th Mav bits project 1 - 9th Ardublock with mav-board project 1,2,3,6,11		
Enlight projects lesson plan	Learning	Diy project
Project 1: IR bot: <ul style="list-style-type: none"> ● Principles of IR sensors ● Using IR sensor with motors, Arduino, etc. ● Making the bot by coding to follow a line 	<ul style="list-style-type: none"> ● Concept of IR ● Reflection of light ● Working of motors ● Controlling motors with sensor ● Distance ● Angle 	Project: obstacle avoiding robot with IR
Project 2: Bluetooth bot: <ul style="list-style-type: none"> ● Principles of Bluetooth ● Using Bluetooth to control motors, Arduino, etc. ● Making the bot and controlling it with Bluetooth 	<ul style="list-style-type: none"> ● Concept of Bluetooth ● Transmission and receiving of signal ● Bluetooth bot ● Mobile application development 	Project: control LED, sound with Bluetooth

Projects using Mavboard and Ardublock

1. Blinking of LED
2. Sequence LED
3. On-off LED using button
4. Buzzer
5. Buzzer with button
6. Controlling LED with potentiometer
7. Controlling RGB LED
8. Controlling RGB LED using potentiometer
9. Controlling motors with button
10. IR module buzzer control
11. IR module LED control
12. LED control using ultrasonic sensor
13. Water level indicator
14. Security system using ultrasonic sensor
15. Read button value
16. Read potentiometer value
17. Read LDR value
18. LDR LED control
19. LDR RGB control

20. LDR buzzer control
21. Measuring distance using ultrasonic sensor
22. Bluetooth LED control
23. Bluetooth buzzer control
24. Bluetooth control motors
25. Bluetooth-controlled bot
26. Ultrasonic obstacle avoider bot
27. Ultrasonic obstacle attacker bot
28. Ultrasonic edge detector bot
29. IR obstacle avoider bot
30. IR line follower bot

Projects using Mavbits

1. Blinking of LED
2. On-off LED using button
3. Buzzer
4. Buzzer with button
5. RGB LED, RGB LED with button
6. Controlling LED with potentiometer
7. Controlling RGB LED with potentiometer
8. Controlling buzzer with potentiometer
9. Working of motor
10. Controlling a motor with button
11. LDR with LED, LDR with buzzer
12. LDR with RGB LED
13. Complex circuit LED and RGB LED
14. Complex circuit LED and fan
15. Complex circuit LED and buzzer
16. Complex circuit buzzer, LED with button
17. Complex circuit buzzer, LED with potentiometer
18. Complex circuit buzzer, LED with LDR

ICT curriculum

Std	Content	Learning competencies	Learning outcome
5 th	<ul style="list-style-type: none"> • Computer fundamentals 	<ul style="list-style-type: none"> • Introduction of ICT • Introduction to computer • Characteristic • Application • Parts of computer 	Help student to become competent & confident user who can use basic knowledge & skills
	<ul style="list-style-type: none"> • Operating system • Windows 7, 8, 10 	<ul style="list-style-type: none"> • Introduction of os • Functions of os • What is windows? • Features of windows 	Students will be able to operate basic software applications.
	<ul style="list-style-type: none"> • Accessories group 	<ul style="list-style-type: none"> • Notepad, word pad, calculator, paint 	Help students to be more creative & innovative
	<ul style="list-style-type: none"> • Basic internet 	<ul style="list-style-type: none"> • Types of network • How does internet work? • What is the URL? • What is a website? • What are search engines? 	Help students to be smart internet users
	<ul style="list-style-type: none"> • Typing skills with educational games 	<ul style="list-style-type: none"> • Basic typing skills & keyboard knowledge 	Understand advanced use of technology
6 th	<ul style="list-style-type: none"> • Computer fundamentals 	<ul style="list-style-type: none"> • Introduction of ICT • Introduction to computer • Characteristic • Application 	Help students to become competent & confident users who can use basic knowledge & skills

		<ul style="list-style-type: none"> Parts of computer 	
	<ul style="list-style-type: none"> Operating system Windows 7, 8, 10 	<ul style="list-style-type: none"> Introduction of os Functions of os What is windows? Features of windows 	Help students to acquire mastery of information, embedded knowledge
	<ul style="list-style-type: none"> Ms-office 2013 	<ul style="list-style-type: none"> Ms word Using ms word through mobile phone Using ms word through google doc Ms-cit hands-on experience (practical) 	<p>Understand advanced use of technology</p> <p>Assist students to grow personally in the modern world by being more creative and innovative</p>
	<ul style="list-style-type: none"> Basic internet 	<ul style="list-style-type: none"> Types of network How the internet works? What is the URL? What is a website? What are search engines? 	Help students, to be smart internet users
	<ul style="list-style-type: none"> Typing skills with educational games 	<ul style="list-style-type: none"> Keyboard knowledge English/Hindi/Marathi typing practice 	Help students to be more creative and innovative
7 th	<ul style="list-style-type: none"> Computer fundamentals 	<ul style="list-style-type: none"> Introduction of ICT Introduction to computer Characteristic Application Parts of computer 	Help student to become competent & confident user who can use basic knowledge & skills

	<ul style="list-style-type: none"> Operating system Windows 7, 8, 10 	<ul style="list-style-type: none"> Introduction of os Functions of os What is windows? Features of windows 	Help students to acquire mastery of information, embedded knowledge
	<ul style="list-style-type: none"> Ms-office 2013 	<ul style="list-style-type: none"> Ms excel Using ms excel through mobile phone Using ms excel through google sheet Ms-cit hands-on experience (practical) 	Understand advanced use of technology Assist students to grow personally in modern world by being more creative and innovative
	<ul style="list-style-type: none"> Basic internet 	<ul style="list-style-type: none"> Types of network How does the internetwork? What is URL? What is a website? What is a search engine? 	Help students, to be smart internet users
	<ul style="list-style-type: none"> Typing skills with educational games 	<ul style="list-style-type: none"> Keyboard knowledge English/Hindi/Marathi typing practice 	Help students to be more creative and innovative
8 th	<ul style="list-style-type: none"> Computer fundamentals 	<ul style="list-style-type: none"> Introduction of ICT Introduction to computer Characteristic Application Parts of computer 	Help students to become competent & confident user who can use basic knowledge & skills
	<ul style="list-style-type: none"> Operating system Windows 7, 8, 10 	<ul style="list-style-type: none"> Introduction of os Functions of os 	Help students to acquire mastery of

		<ul style="list-style-type: none"> • What is windows? • Features of windows 	information, embedded knowledge
	<ul style="list-style-type: none"> • Ms-office 2013 	<ul style="list-style-type: none"> • Ms PowerPoint • Using ms PowerPoint Through mobile phone • Using ms PowerPoint Through google slides • Ms-cit hands-on experience (practical) 	<p>Understand advanced use of technology</p> <p>Assist students to grow personally in the modern world by being more creative and innovative</p>
	<ul style="list-style-type: none"> • Basic internet 	<ul style="list-style-type: none"> • Types of network • How does the internetwork? • What is the URL? • What is a website? • What are search engines? 	Help students, to be smart internet users
	<ul style="list-style-type: none"> • Typing skills with educational games 	<ul style="list-style-type: none"> • Keyboard knowledge English/Hindi/Marathi typing practice 	Help students to be more creative and innovative
9 th	<ul style="list-style-type: none"> • Computer fundamentals 	<ul style="list-style-type: none"> • Introduction of ICT • Introduction to computer • Characteristic • Application • Parts of computer 	Help students to become competent & confident user who can use basic knowledge & skills
	<ul style="list-style-type: none"> • Operating system • Windows 7, 8, 10 	<ul style="list-style-type: none"> • Introduction of os • Functions of os 	Help students to acquire mastery of

		<ul style="list-style-type: none"> • What is windows? • Features of windows 	information, embedded knowledge
	<ul style="list-style-type: none"> • Ms-office 2013 	<ul style="list-style-type: none"> • Ms word • Ms excel • Ms PowerPoint • Ms outlook • Use ms word, excel PowerPoint through mobile phone • Using doc, sheets, slides google • Ms-cit hands-on experience (practical) 	<p>Understand advance use of technology</p> <p>Assist students to grow personally in modern world by being more creative and innovative</p>
	<ul style="list-style-type: none"> • Basic internet 	<ul style="list-style-type: none"> • Types of network • How does the internetwork? • What is the URL? • What is a website? • What are search engines? 	Help students to be smart internet users
	<ul style="list-style-type: none"> • Typing skills with educational games 	<ul style="list-style-type: none"> • Keyboard knowledge English/Hindi/Marathi typing practice 	Help students to be more creative and innovative
	<ul style="list-style-type: none"> • Information system • Basic hardware course 	<ul style="list-style-type: none"> • People, procedure, software, hardware, and data • Name the parts of computer 	

		<ul style="list-style-type: none"> ● Use of different parts of computer 	
10 th	<ul style="list-style-type: none"> ● Computer fundamentals 	<ul style="list-style-type: none"> ● Introduction of ICT ● Introduction to computer ● Characteristic ● Application ● Parts of computer 	Help student to become competent & confident user who can use basic knowledge & skills
	<ul style="list-style-type: none"> ● Operating system ● Windows 7, 8, 10 	<ul style="list-style-type: none"> ● Introduction of os ● Functions of os ● What is windows? ● Features of windows 	Help students to acquire mastery of information, embedded knowledge
	<ul style="list-style-type: none"> ● Information system (5 parts) 	<ul style="list-style-type: none"> ● People, procedure, software, hardware, and data 	Help them to adjust the inevitable future changes
	<ul style="list-style-type: none"> ● Basic internet 	<ul style="list-style-type: none"> ● Types of network ● How does the internet network? ● What is the URL? ● What is a website? ● What are search engines? 	Help students to be smart internet users
	<ul style="list-style-type: none"> ● Typing skills with educational games 	<ul style="list-style-type: none"> ● Keyboard knowledge ● English/Hindi/Marathi typing practice 	Help students to be more creative and innovative
	<ul style="list-style-type: none"> ● Computer programming language 	<ul style="list-style-type: none"> ● Scratch visual or html coding 	Prepare students for the world of tomorrow

	<ul style="list-style-type: none"> • Mobile app development 	<ul style="list-style-type: none"> • Create app 	<p>Assist students to grow personally in the modern world by being more creative and innovative</p>
	<ul style="list-style-type: none"> • Digital marketing 	<ul style="list-style-type: none"> • Use of social media 	<p>Will be able to learn basic programming and software applications to create an appreciation of technology in everyday life</p>

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Maharashtra board syllabus for information technology for class 11th science

Chapters	Detailed syllabus
Chapter 1: introduction to information technology	<ul style="list-style-type: none"> ● Information technology: definition, introduction, information systems, software, data ● It in business, industry, home, play, education, training, science and engineering ● Computers in hiding
Chapter 2: office suite	<ul style="list-style-type: none"> ● Word processor- microsoft word and its main features ● Spreadsheets – microsoft excel and its main features ● Presentations – microsoft powerpoint
Chapter 3: multimedia	<ul style="list-style-type: none"> ● Multimedia-definition, communication, components, building blocks, scope, uses, application purposes ● Overview of computer images ● Digital audio ● Overview of video ● Flash – overview and introduction ● Multimedia design and future directions
Chapter 4: web browsers, email clients and messenger utilities	<ul style="list-style-type: none"> ● Overview, working of the internet and www ● Role of web servers, clients ● Web browsers and their use, popular web browsers ● E-mail servers and protocols ● Email clients and web-based mail access using browser

	<ul style="list-style-type: none"> • Messenger services and clients • Ftp
Chapter 5: introduction to networking	<ul style="list-style-type: none"> • Communication and network technologies <ul style="list-style-type: none"> • Internet, network communication and protocols • Transmission media, communication over wires and cables, wireless communication and standards • Network architecture, relationships and features • Cable topologies • Network hardware
Chapter 6: visual basic.net	<ul style="list-style-type: none"> • Introduction to .net framework • Introduction to the visual studio/visual basic ide • Console and windows applications • Introduction to visual basic.net syntax <ul style="list-style-type: none"> • Selection and iteration statements • Arrays and enumerations • Introduction to windows forms, message box and input box • Handling keyboard and mouse events • The control class controls • Library functions • Simple programs based on all the above
Chapter 7: HTML	<ul style="list-style-type: none"> • Uses, features, properties, and limitations

	<ul style="list-style-type: none"> • Tags and attributes, basic tags paragraph and heading tags, comments • Ordered and unordered lists and related tags, nested lists • Anchor tag and hyperlinks in HTML • Division and physical style tags, working with fonts, font types, sizes and colors • Body background color, text color, and hyperlink colors, pre-formatting, line break, and horizontal rules, displaying special characters in HTML • Images in HTML, related tags and attributes, features of BMP, jpg and gif raster image formats • Tables in HTML and related tags • Marquee • Java applets
Chapter 8: introduction to javascript	<ul style="list-style-type: none"> • Limitations of plain HTML • Difference between java and javascript, javascript as a scripting language • Javascript basic syntax • Insertion of javascript in HTML • Javascript built-in function • Selection and iteration in javascript • Built-in object properties and methods related to array • Strings math and date • Simple HTML programs using javascript

Maharashtra board syllabus for information technology for class 11th Arts

Chapters	Detailed syllabus
Chapter 1: introduction to information technology	<ul style="list-style-type: none"> ● Information technology: definition, introduction, information systems, software, data ● It in business, industry, home, play, education, training, science and engineering ● Computers in hiding
Chapter 2: office suite	<ul style="list-style-type: none"> ● Word processor- Microsoft word and its main features ● Spreadsheets – Microsoft excel and its main features ● Presentations – Microsoft PowerPoint
Chapter 3: multimedia	<ul style="list-style-type: none"> ● Multimedia-definition, communication, components, building blocks, scope, uses, application purposes ● Overview of computer images ● Digital audio ● Overview of video ● Flash – overview and introduction ● Multimedia design and future directions
Chapter 4: web browsers, email clients and messenger utilities	<ul style="list-style-type: none"> ● Overview, working of the internet and www ● Role of web servers, clients ● Web browsers and their use, popular web browsers ● E-mail servers and protocols ● Email clients and web-based mail access using browser ● Messenger services and clients ● Ftp

<p>Chapter 5: file and disk utilities</p>	<ul style="list-style-type: none"> ● Concept of files and directories ● File archival, compression and encryption ● Disc tools (windows 7) error checking and defragmentation ● Computer security
<p>Chapter 6: gif animator</p>	<ul style="list-style-type: none"> ● Gif animation, image count, looping and repeat count ● Color palettes and image dither methods ● Image parameters, Image transparency
<p>Chapter 7: vector graphics using coreldraw</p>	<ul style="list-style-type: none"> ● Introduction ● Tools and menus ● Basic drawing working with text-basic ● Page layout, Printing
<p>Chapter 8: html</p>	<ul style="list-style-type: none"> ● Uses, features, properties and limitations ● Tags and attributes, basic tags paragraph and heading tags, comments <ul style="list-style-type: none"> ● Ordered and unordered lists and related tags, nested lists ● Anchor tag and hyperlinks in html ● Division and physical style tags, working with fonts, font types, sizes and colors <ul style="list-style-type: none"> ● Body background color, text color and hyperlink colors, pre-formatting, line break, and horizontal rules, displaying special characters in html ● Images in html, related tags and attributes, features of bmp, jpg and gif raster image formats ● Tables in html and related tags ● Marquee ● Java applets

**Maharashtra board syllabus for information technology for class
11th commerce**

Chapters	Detailed syllabus
Chapter 1: introduction to information technology	<ul style="list-style-type: none"> ● Information technology: definition, introduction, information systems, software, data ● It in business, industry, home, play, education, training, science and engineering ● Computers in hiding
Chapter 2: office suite	<ul style="list-style-type: none"> ● Word processor- microsoft word and its main features ● Spreadsheets – microsoft excel and its main features ● Presentations – microsoft powerpoint
Chapter 3: multimedia	<ul style="list-style-type: none"> ● Multimedia-definition, communication, components, building blocks, scope, uses, application purposes ● Overview of computer images ● Digital audio ● Overview of video ● Flash – overview and introduction ● Multimedia design and future directions
Chapter 4: web browsers, email clients and messenger utilities	<ul style="list-style-type: none"> ● Overview, working of the internet and www ● Role of web servers, clients ● Web browsers and their use, popular web browsers ● E-mail servers and protocols ● Email clients and web based mail access using browser ● Messenger services and clients ● Ftp
Chapter 5: file and disk utilities	<ul style="list-style-type: none"> ● Concept of files and directories ● File archival, compression and encryption

	<ul style="list-style-type: none"> ● Disc tools (windows 7) error checking and defragmentation ● Computer security
Chapter 6: basic database concepts	<ul style="list-style-type: none"> ● Definition of database and database program ● Tables, rows/records, columns/ fields, differences between database and ● Relational abilities and meaning of relational database ● Basic concepts of database and rdbms ● Constraints to ensure data quality ● Database administration, software development, business analysis ● Sql, history and command categories
Chapter 7: overview of tally	<ul style="list-style-type: none"> ● Advantages of computerized accounting ● Introduction to tally and its features
Chapter 8: html	<ul style="list-style-type: none"> ● Uses, features, properties and limitations ● Tags and attributes, basic tags paragraph and heading tags, comments ● Ordered and unordered lists and related tags, nested lists ● Anchor tag and hyperlinks in html ● Division and physical style tags, working with fonts, font types, sizes and colors ● Body background color, text color and hyperlink colors, pre-formatting, line break, and horizontal rules, displaying special characters in html ● Images in html, related tags and attributes, features of bmp, jpg and gif raster image formats ● Tables in html and related tags ● Marquee



	<ul style="list-style-type: none">• Java applets
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Maharashtra board syllabus for information technology for class 12th science

Chapters	Detailed syllabus
Chapter 1: web publishing	<ul style="list-style-type: none"> ● Html page frames ● Image mapping ● Forms and form objects ● Inserting sound and video ● Use of Unicode and Indian language fonts ● Cross-browser testing ● Introduction to CSS ● Web server
Chapter 2: cyber laws and ethics	<ul style="list-style-type: none"> ● Moral, ethics and law ● Ethics culture and ethics for computer users, professionals and business ● Information service ● Code and guidelines of ethics ● Introduction to cyber laws and it act of india 2000 <ul style="list-style-type: none"> ● Digital signature, electronic records attribution, acknowledgement and dispatch ● Ten commandments of computing ● Security, privacy and control ● Intellectual property rights
Chapter 3: e-commerce	<ul style="list-style-type: none"> ● Electronic commerce-scope, definition ● Trade cycle ● Electronic market - usage, advantages and disadvantages, future <ul style="list-style-type: none"> ● Electronic data interchange definition, benefits ● Internet commerce, e-commerce in perspective ● Edi security

<p>Chapter 4: client-side scripting using javascript</p>	<ul style="list-style-type: none"> ● Difference in client and server-side scripting ● Javascript as universal client-side scripting language ● The document object model ● Javascript events and event handling ● Simple javascript programs
<p>Chapter 5: asp.net (using visual basic.net)</p>	<ul style="list-style-type: none"> ● Introduction and use of web applications, introduction to .net framework ● Introduction to asp.net ● Introduction to the visual studio 2008/ 2010 ide and source view control class ● Web server controls ● Html server controls ● Validation server controls ● Components and applications ● Introduction to applications and state management
<p>Chapter 6: database concepts and interaction with asp.net</p>	<ul style="list-style-type: none"> ● Microsoft access table relationships, queries and query types ● Introduction to reports ● Introduction to SQL and comparison with access ● Introduction to data access with asp.net ● Connected data access and disconnected data architecture, ado.net objects ● The access data source control, its properties and use

Maharashtra board syllabus for information technology for class 12th arts

Chapters	Detailed syllabus
Chapter 1: web publishing	<ul style="list-style-type: none"> ● Html page frames ● Image mapping ● Forms and form objects ● Inserting sound and video ● Use of Unicode and Indian language fonts ● Cross-browser testing ● Introduction to CSS ● Web server
Chapter 2: cyber laws and ethics	<ul style="list-style-type: none"> ● Moral, ethics and law ● Ethics culture and ethics for computer users, professionals and business ● Information service ● Code and guidelines of ethics ● Introduction to cyber laws and it act of India 2000 <ul style="list-style-type: none"> ● Digital signature, electronic records attribution, acknowledgment and dispatch ● Ten commandments of computing ● Security, privacy and control ● Intellectual property rights
Chapter 3: e-commerce	<ul style="list-style-type: none"> ● Electronic commerce-scope, definition ● Trade cycle ● Electronic market - usage, advantages and disadvantages, future <ul style="list-style-type: none"> ● Electronic data interchange definition, benefits

	<ul style="list-style-type: none"> ● Internet commerce, e-commerce in perspective ● Edi security
Chapter 4: introduction to networking	<ul style="list-style-type: none"> ● Communication and network technologies ● Internet, network communication and protocols <ul style="list-style-type: none"> ● Transmission media communication over wires and cables, wireless communication and standards ● Network architecture relationships and features ● Cable topologies ● Network hardware
Chapter 5: DTP using adobe InDesign	<ul style="list-style-type: none"> ● Document setup and working environment ● Creating frames, moving objects, selection techniques ● Working with text ● Character settings ● Paragraph settings working with images in InDesign ● The pages panel ● Working with tables ● Exporting to pdf
Chapter 6: adobe acrobat	<ul style="list-style-type: none"> ● Concept of pdf, applications, features, ability to embed images and fonts, etc. ● Adobe pdf writer printer and pdf conversion settings

	<ul style="list-style-type: none"> • The adobe acrobat program, features and tools • Document security options
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**Maharashtra board syllabus for information technology for class
12th commerce**

Chapters	Detailed syllabus
Chapter 1: web publishing	<ul style="list-style-type: none"> • Html page frames • Image mapping • Forms and form objects • Inserting sound and video • Use of Unicode and Indian language fonts • Cross-browser testing • Introduction to CSS • Web server
Chapter 2: cyber laws and ethics	<ul style="list-style-type: none"> • Moral, ethics and law • Ethics culture and ethics for computer users, professionals and business • Information service • Code and guidelines of ethics • Introduction to cyber laws and it act of India 2000 <ul style="list-style-type: none"> • Digital signature, electronic records attribution, acknowledgment and dispatch • Ten commandments of computing • Security, privacy and control • Intellectual property rights

<p>Chapter 3: e-commerce</p>	<ul style="list-style-type: none"> ● Electronic commerce-scope, definition ● Trade cycle ● Electronic market - usage, advantages and disadvantages, future ● Electronic data interchange definition, benefits internet commerce, e-commerce in perspective EDI security
<p>Chapter 4: introduction to networking</p>	<ul style="list-style-type: none"> ● Communication and network technologies ● Internet, network communication and protocols ● Transmission media communication over wires and cables, wireless communication and standards ● Network architecture relationships and features ● Cable topologies ● Network hardware
<p>Chapter 5: data management using access</p>	<ul style="list-style-type: none"> ● Microsoft access and its main features, database concepts ● Opening existing databases ● Working with tables ● Introduction to forms and working with forms ● Table relationships (one-to-one and many-to-many) queries, query types, creation of query manually as well as using wizard, calculations using queries ● Introduction to reports and working with reports

Chapter 6: tally

- Creating and configuring company menus related to
 - Working with groups and ledgers
 - Study of cost centers and vouchers
 - Printing purchase orders, sales orders, and invoices
 - Study of trial balance, balance sheet, and profit and loss account

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A.I Syllabus

Lesson 1 - Getting started

The first section of the AI curriculum for schools is for introduction to AI and pictoblox. It introduces students to AI basics and its applications

Lesson 2 - Artificial intelligence techniques

The second section of the AI curriculum for schools teach students AI concepts such as computer vision, face recognition, text recognition, and speech recognition through hands-on AI projects

Lesson 3 - Machine learning

The third section of the AI curriculum for schools introduces students to machine learning and how to make ml-based projects such as a pose classifier and an AI-version of the rock paper scissors game.

Lesson 4 - Ethics in AI

The fourth section of the AI curriculum for schools introduces students to ethics and why they are important to keep in mind when learning and applying concepts of AI and machine learning to their projects.

Lesson 5 - Capstone project

The final section of the AI curriculum for schools is where students get to apply all the concepts they have learned in the previous sections to make a project to solve a real-world problem of their choice.

Software preinstalled for learning

Astronomy

- **Celestia**

Celestia lets you view the night skies from any point on earth at any time or virtually fly through space to see the sky from any point in the known universe.

- **Stellarium**

it does let you view the night skies from any point on earth's surface at any date and time

Art

- **Tux Paint**

Best for younger children, TuxPaint lets kids make their own artistic creations with a variety of stamps, drawing tools, and special effects

Chemistry

- **Kalzium**

Kalzium offers a free guide to the periodic table, including chemical data, energy information, diagrams, and a glossary

Educational Games

- **GCompris**

Kids aged 2 to 10 will find a huge number of educational games to play in GCompris.

- **ChildsPlay**

Aimed at preschoolers and kindergarteners, this app includes a variety of memory and letter recognition games, as well as classic pong and Pacman

Geography

The original .Net version of WorldWind offers very similar functionality as Google Earth.

Maths

- **GraphCal**

GraphCalc does everything a handheld graphing calculator would do

- **Gnuplot**

This command-line tool creates both 2D and 3D graphs from mathematical functions.

- **Maxima**

Calls itself “a computer algebra system,” Maxima graphs in 2D and 3D and performs differentiation, integration, Taylor series, Laplace transforms, ordinary differential

equations, systems of linear equations, polynomials, and sets, lists, vectors, matrices, and tensors.

Typing

- **TuxType**

Designed for elementary students who are learning their way around the keyboard, TuxType offers basic typing lessons and two fun typing games.

Block Coding

In uncomplicated terms, block coding is a process used in computer programming where text-based software codes change to a visual block format to create animated games, characters, and even stories

- Scratch
- Snap
- Blockly
- Edublock



- Ardublock
- Python
- Java
- HTML / CSS

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Turning thoughts into action and
creativity into Innovations.

Harnessing knowledge via our motto
of Think n'
Do.



MAVERICK DEN
Think 'n' Do