



School of Information Technology

Computational Thinking and Coding

Course Synopsis

Aim : This course is a foundational 8-hour training programme that aims to help beginners experience computation thinking through an interactive AI robot. This course will equip participants with foundational understanding of programming.

Objectives : Upon successful completion of this course, the participants will be able to:

1. Describe the basic steps in computation thinking and coding
2. Use the tools available to code the AI Robot in the software
3. Apply the drag and drop tools to create codes to make the robot perform simple actions
4. Develop a simple programme to move the robot through a maze.

Learning Outcomes :

1. Describe the basic steps in computation thinking and coding
2. Identify the tools available to code simple actions in robots
3. Apply the coding tools to create simple programs

Course Lesson Plan for Computational Thinking and Coding for Beginners

Day 1	
Duration	Topics
0900 hrs to 1030 hrs (Introduction to Computational Thinking) [1.5 Hrs]	<ul style="list-style-type: none"> ➤ Introduction to Computation Thinking ➤ How coding is used in everyday life (mobile phone, traffic lights, home appliances and other items) ➤ Introduce programming concepts such as decomposition and abstraction using a physical activity ➤ Guide the students through step by step on using loops and conditions and learn about algorithms <p><u>Learning Outcomes:</u></p> <ul style="list-style-type: none"> ➤ List the everyday items that requires coding ➤ Understand programming concepts such as loops and conditions <p><u>Experiential Learning Activities</u></p> <ul style="list-style-type: none"> ➤ Video on programming/coding ➤ Hands-on activity that introduce computational thinking and programming concepts (Potato Pirate Card Game)
1030 hrs to 1100 hrs	<ul style="list-style-type: none"> ➤ Tea Break
1100 hrs to 1300 hrs (Basic actions and coding using Cozmo) [2 Hrs]	<ul style="list-style-type: none"> ➤ Introduce the Cozmo robot, and start with some simple games ➤ Introduce the drag and drop coding function for coding the robot's actions ➤ Guide the students through step by step videos and examples of coding the robot <p><u>Learning Outcomes:</u></p> <ul style="list-style-type: none"> ➤ Identify the drag and drop functions for coding the robot. ➤ Apply the tools to make the robot perform simple tasks. <p><u>Experiential Learning Activities</u></p> <ul style="list-style-type: none"> ➤ Video on programming/coding the actions of the robot ➤ Hands-on coding with the robot (moving forward and backwards, speak, etc)
1330 hrs to 1430 hrs	<ul style="list-style-type: none"> ➤ Lunch
1430 hrs to 1600 hrs (Coding Task 1)	<ul style="list-style-type: none"> ➤ Recap on the robots' functions such as movement and grabbing of cubes.

[1.5 hr]	<ul style="list-style-type: none"> ➤ To code the robot to move through a physical map of a maze <p><u>Experiential Learning Activities</u></p> <ul style="list-style-type: none"> ➤ Code the robot to run through a maze ➤ Prize giving to the fastest team to complete the coding
1600 hrs to 1630 hrs	<ul style="list-style-type: none"> ➤ Tea Break
1630 hrs to 1800 hrs (Coding Task 2 and Conclusion) [1.5 hr]	<ul style="list-style-type: none"> ➤ To code the robot with facial recognition as well as speaking functions to create a chicken rice seller robot ➤ Recap on conditions, loops and algorithms in programming <p><u>Experiential Learning Activities</u></p> <ul style="list-style-type: none"> ➤ Code the robot to recognize face and to speak ➤ Prize giving to the fastest team to complete the coding