



## PROGRAM INFORMATION: MASTER CLASSES

### Years 6, 7 and 8

<b>Program Title</b>	<b>MicroBit Micro Controllers and the Internet of Things</b>
<b>Time Schedule (AEDT)</b>	Registration commences 10 minutes before the session begins <b>WEEKNIGHT PROGRAMS</b> <b>Registration: 4.20 pm</b> <b>Session: 4.30 pm – 6.00 pm</b> <b>SATURDAY MORNING PROGRAMS</b> <b>Registration: 9.20 am</b> <b>Session: 9.30 am – 11.00 am</b>
<b>Zoom Meeting Links</b>	Meeting link, meeting I.D and password will be emailed two days before the program.
<b>Zoom Information</b>	Are you new to Zoom? Please use this <a href="#">link</a> for Zoom start-up information.
<b>Online Program Set-up</b>	Please prepare the following: <ul style="list-style-type: none"><li>✓ Headphones</li><li>✓ Notepad for writing/taking notes</li><li>✓ Pens/pencils</li></ul>
<b>Program Requirements</b>	NONE

### Program Description

**Introduction:** In 2018 for the first time in history, there were more devices connected to the Internet of Things than there are people on earth . . . In 2020 there will be 31 Billion of them, but what kind of devices are these and why are they significant? Well the vast majority of IoT devices are microcontrollers, small computers that live on one microchip and have less than 1% of computing power and memory of a smartphone. They are however very significant because they interface with the real world by sensing the environment and making automatic decisions. They operate traffic lights, automatic doors and elevators as well as all of your home appliances. In this masterclass you will be learning to program one such microcontroller, called BBC micro:bit using Python. The micro:bit can sense acceleration, magnetic field, temperature, light intensity and human touch. We program: games that measure reaction time and memory, distributed alarm systems and smart fitness gadgets that track your steps and help your co-ordination and balance.

#### Session 1: Introduction to MicroPython

In this session we learn about microcontrollers, the Internet of Things and we program our first two games. The first of which is a Magic 8 Ball Game, the second is a Button Masher Program which is similar to cookie clicker game

#### Session 2: Reaction Time Games

In this session we will program a game that measure how fast you can react to a light signal in hundredths of a second and then we will adapt our code to measure how fast you can make a simple decision (to press button A and button B)



### **Session 3: Brick Dodging Game and Balance Dot**

This session is all about the measurement of forces using the built in accelerometer, the first application we will built is a seismometer which displays the forces on x, y and z axis. We will follow this by creating a balance dot game where a dot moves by tilting the micro:bit and goes on to collect other dots

### **Session 4: Two Player Games and Radio Systems**

In this session we will build a two player dice game and modify the Reaction time game to make it a 2 player game that you can play against a friend. We will wrap up the session demonstrating how these same 2 player games could be played with multiple micro:bits and discussing various applications that become possible as we use more micro:bits that are connected to each other via radio