**Creative Physical computing - MAC**

Week 1 H1

Dive Straight in.

Build simple circuit from Wire, copper tape, aluminium foil. Connect to a CR2032 Battery and red LED.

Create a switch from same conductive materials.

Separate the switch from the LED and connect them to the Arduino.

Blink the LED and control it from the switch.

Week 1 H2

1.Introduction to Creative Physical Computing and the Arduino.

The real world is analogue but computers are digital. A lot of the work we will be doing is around converting from analogue to digital and back again.

3. Looking at Popular platforms

Arduino, Raspberry Pi + other SBCs , Microbit, Adafruit boards, Professional boards, MBED.

4.A look around the Arduino Board and IDE.

Uno / Nano / Mega 2560

Clone Boards

Shields.

Focus on Mega 2560 and show the digital pins, PWM and Analog in.

IDE

Open Sketch

New Sketch

Save

Sketchbook

Examples

Verify

Compile

Set Port

Set Board

Setup(); and Loop();

Write the Blink to pin 13

Connect an LED and blink the LED.

Write the Better blink

6. Switches

Switches, pull up and pull down resistors. Internal pull up.

Control the LED from the Switch.

Delay();

PWM();

Week 2 H1

Coloured LEDs

Neopixels intro install library.

7.Analogue

Potentiometer, Strain gauge, Fabric, Capacitive,

Outputs

8. Analogue - PWM

Week 2 H2

Inputs

Creative Switches, Fabric Switches.

Week 3

Review and software

**Software**

Loop the loop

Make a decision

Iterate

Variables

Functions

Libraries

Week 4

Sound

10 Speakers, Piezo Buzzers,

11 Microphones.

FFT/FHT

12 MP3/WAV Playback.

Week 5

Light -

13 LEDs, Visible, Infra Red, U.V.

14 Neopixels.

Week 6

Movement -

15 Motors,

16 Servos,

17 Detecting movement presence. I.R Passive/Active , Ultrasound

Week 7

Getting bigger -

18 Relays,

19 MOSFETS,

20 Amplifiers.

Week 8

IOT Internet of Things

21 Cheerlights

Week 9

Data

Serial Connection -

22 Arduino to P.C and P.C to Arduino.

Arduino to Arduino / Software Serial.

Processing, Open Frameworks, Unity.

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Week 10

Projection Mapping - Possibly with guest tutor Allie Litherland

23 Wifi

24 Bluetooth and Beacons

Sensors and Sensors-ability

25 Light,

26 Colour,

27 temperature.

28 Gas and environment

I2C / SPI

Compass

Orientation

Acceleration

GPS

Pulse

Thermal Camera

Phone

Powerful Sensors

29 Camera

30 Kinect / real sense

31 Leap Motion

32 Tools

Wire Cutters, Small screwdrivers, pliers, Stanley knife. Breadboard, Veroboard - prototyping board.

Soldering kit - Soldering Iron, Sponge/Brass, 3rd Hand, Magnifying glass

33 Test equipment

Multimeter

Oscilloscope

Segger , J-Link.

PSU.

**34 Buying Stuff.**

Pimoroni

Kitronik

Cool Components

Adafruit / Sparkfun.

RS/ Farnell

Mouser/ Digikey

Amazon / Ebay

China - AliExpress , Bangood

Examples

Find interesting Videos

Team Lab

Daniel Rozin

Universal Everything

Kate Sicchio

Allie Litherland

Alex May

Ready salted code

Takis at Tate