**Curriculum Skeleton**

This document outlines the general topics covered in the EngiMake Learning materials. Each of these four broad topic consists of multiple smaller lessons.

**Goals and Outcome**

The goal of these introduce students to practical robotics. All key aspects of robotics will be covered, including 3D Design, 3D Printing, Coding and Electronics. Upon completing these materials, the student will be confident in programming QuadBot able to complete the **QuadBot Programming Tasks**. The student will also be able to begin building custom robotics using the QuadBoard.

**Timings**

Most lessons consist of a 10 minute introduction, followed by 40 minutes of hands-on activities (a total of around 1 hour). Some lessons will require a longer duration of up to 2 hours, allowing for a 90 minutes of hands-on activities.

**General Format**

The 10 minute introduction will cover the learning objectives and goals. The 40-90 minute activities are completed by the student on an individual basis, following step by step materials. The teacher will support and assist where necessary. Activities can also be done in groups of up to three students each.

**Staffing**

These workshops are ideally staffed by a teacher and assistant, for up to 30 students.

**Support Materials**

Each lesson is accompanied with a teacher’s guide to assist in delivery.

**Target Age**

The optimal age group for these materials is between 14 upwards.

1. **3D Design**
   1. 2D Sketching in 123D Design
   2. 2D Modeling in 123D Design
   3. 3D Modeling in 123D Design
   4. Parametric Modelling in Autodesk Fusion 360
   5. Sculpting in Fusion 360
   6. Customising QuadBot in Fusion 360
2. **3D Printing**
   1. Exporting a design for 3D Printing
   2. Using Cura for 3D Print setup
   3. 3D Printing explained
   4. 3D Printing setup
3. **Coding**
   1. Introduction to QuadBot
   2. Introduction to Arduino Programming
   3. Basic input/output with QuadBot
   4. Simple movements with QuadBot
   5. Sensing and acting
   6. Introduction to algorithms
   7. QuadBot walking algorithm
4. **Electronics**
   1. Introduction to Electronics
   2. QuadBot Electronics
   3. Sensors and Motors