# Miko Metals – Counter Project

Produced by the ETTA in association with Miko Metals

Prior Knowledge.

This project is intended for a first-year class to be produced in the second half of term

Students should already have created projects that include Cutting, Filing and Finishing. They should also have been introduced to basic drafting skills and dimensioning.

New Knowledge

* Introduction to Mechatronics (Input, Process, Output)
* Cutting and filing an internal curve
* Design process
* Assembly of a project

Parts.

* Base 110\*50\*6 (Slots cut per laser file supplied)
* Upright 160\*100\*6 (Base cut per drawing supplied) (Laser File included with Hole layout
* Counter as supplied by Miko Metals (Code)
* 6 of M4x15 Pan Nut and Screw
* Sticky Foam Pads for mounting electronics

## Unit 1 – Mechatronics and Design

**Learning Outcomes**

* 1.7 - **develop** engineered solutions to various challenges
* 1.11 - **create** sketches, models and working drawings
* 1.13 - use **appropriate** technical language and notations
* 2.2 - **evaluate** the factors that influence design
* 3.2 - **investigate** relationships between inputs, processes and outputs for basic control systems

**Mechatronics**

**Control Systems.**

Introduction of Concept of Control Systems

Student Work

1. Students to define what an input Device is
2. Students identify 3 input devices
3. Students to define what an output device is
4. Students to identify 3 output devices.
5. Students identify what a process device is
6. Students give 1 example of a control system identifying the input, the process that takes place and the output.  
   e.g. In a Greenhouse the input is a temperature sensor, The process monitors the temperature and when it reaches a certain value the output is a motor that opens a window to ventilate the greenhouse.

**Design**

Students are supplied with outlines (See associated PowerPoint for the student handouts) of the upright piece with the counter board indicated They have to design an opening for the turnstile. They have to take into account the location of the locating pegs and the size of the sensor.

Student work

* Student must develop 3 different styles of turnstile within the constraints given on the worksheet
* Choose final Design and say why they chose that design
* Students must include all relevant measurements

## Unit 2: Manufacturing

**Learning Outcomes**

* 1.8 - **identify** appropriate tools and equipment specific to a task
* 1.9 - **apply** suitable manufacturing processes to engineer a product
* 2.8 - **manufacture** a product from a working drawing
* 2.10 - **incorporate** basic project management techniques

**Student Work**

* Section on the worksheet for planning
  + Identify the tools needed
  + Identify the steps needed
* Manufacture to a set standard
* Apply a suitable finish
* Assemble the finished project without using glue

**Formative Feedback**

Teacher gives feedback based on the rubric below and gives the student a grade.

Students must record the feedback in their engineering copy and present to the teacher for signing

Grading Rubric.

Provided as a separate File

PowerPoint

Provided as a separate File