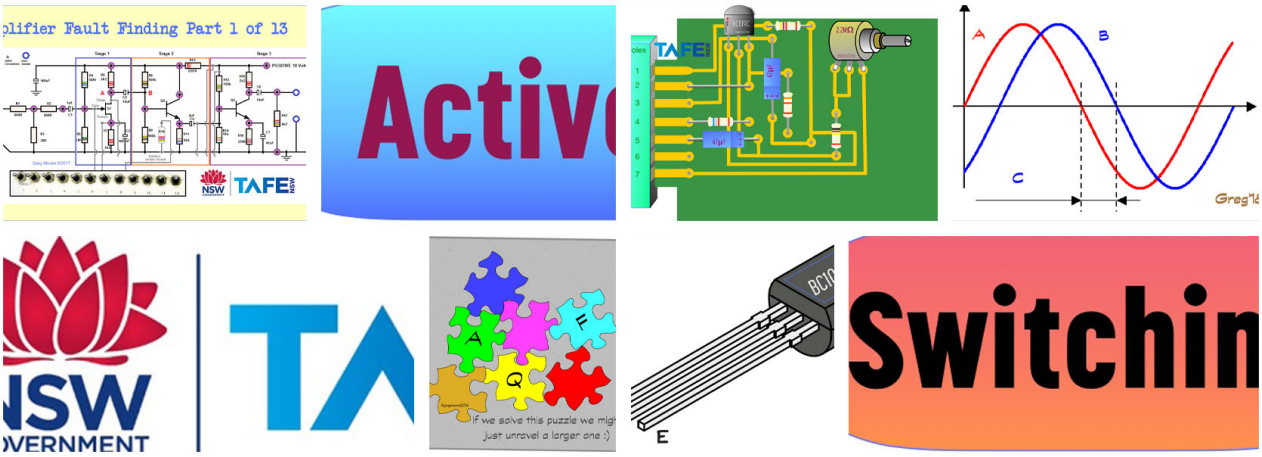


UEENEEH188A Design and develop electronics - computer systems projects

incorporating UEENEEH141A (project management)

An Introduction to this unit

In the Advanced Diploma of Electronics and Communications you will use project management skills alongside your final project, UEENEEH141A

In the Diploma of Electronics and Communications you will only do UEENEEH188A where you make a final project and satisfy all the criteria of that unit of competency.

In the past, students have made microprocessor based equipment for analysing train braking systems, temperature plotting systems for bacteriology incubators and radio controlled instrumentation switching equipment.

During your course you may have more or less specialised in microprocessor, or analogue streams and this final project is one of substantial input on your part to demonstrate your abilities as an electronics worker / designer.

There is a large emphasis put onto the construction of the project as well as the planning and design. From course inception, you learned tools and fabrication procedures in unit UEENEEE102A, additionally you learned OHS in units UEENEEE101A and UEENEEE137A. You learned Soldering in unit UEENEEH102A

All of these skills are to be used in this project.

Holistic Assessment

Unit of competency name	✤Design and develop electronics – computer systems projects ✤Manage computer systems/electronics projects
Unit of competency number	UEENEEH188A - Design and develop electronics – computer systems projects UEENEEH141A Manage computer systems/ electronics projects
Assessment	Design and develop an electronics project which encompasses all of the learning in the Electronics course.

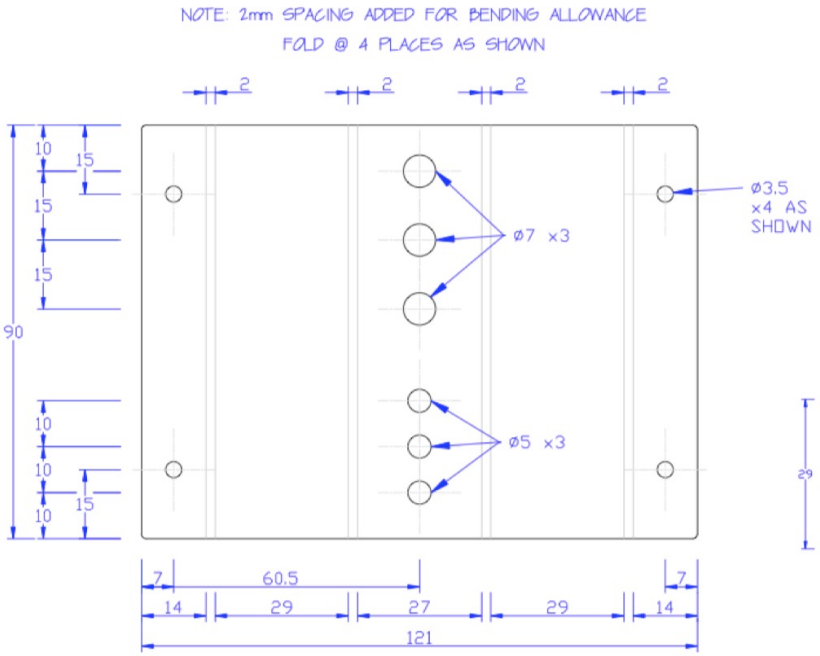
Assessment criteria
To successfully complete the assessment it is required to attempt all 7 tasks and achieve over 65% of total marks

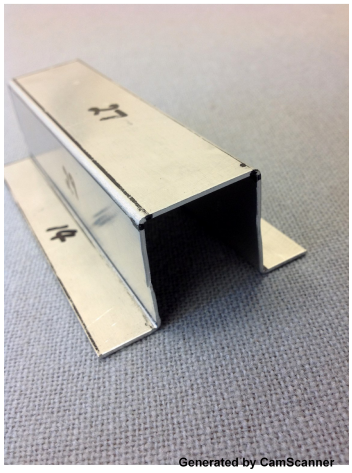
Task No.	Marks Allocated	Marks achieved
Task 1	10	
Task 2	10	
Task 3	20	
Task 4	20	
Task 5	20	
Task 6	10	
Task 7	10	
TOTAL	100	

Project: Design a circuit, develop Layout on a professional chassis and build a functional circuit

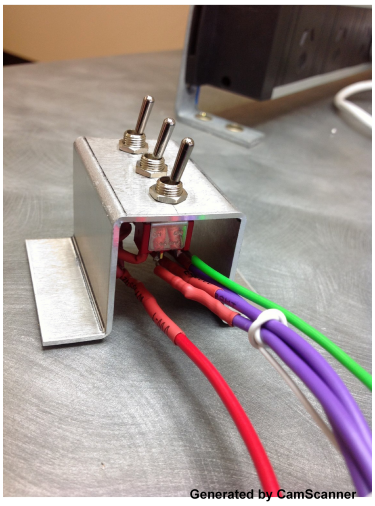
In this assignment you are required to design and develop a functional circuit which will be useful either at your work or as an educational exercise. You will also design a suitable chassis for the project using some suitable CAD software.

Projects on breadboard are **not** acceptable final projects. Recommended chassis material is 0.8mm aluminium of which there is adequate supply in the teaching section for you to use. Consider the following photographs and diagrams:

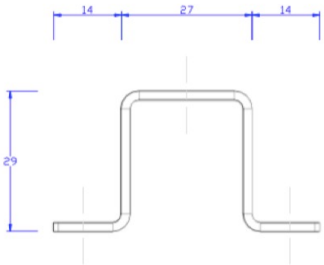




Here is the switch tunnel plan view. DO NOT DRILL ANY HOLES UNTIL AFTER BENDING. THE HOLES FOR THE LED'S AND THE SWITCHES NEED TO BE ACCURATELY MEASURED AGAINST YOUR PURCHASED COMPONENTS.



The end view of the switch tunnel shown here.



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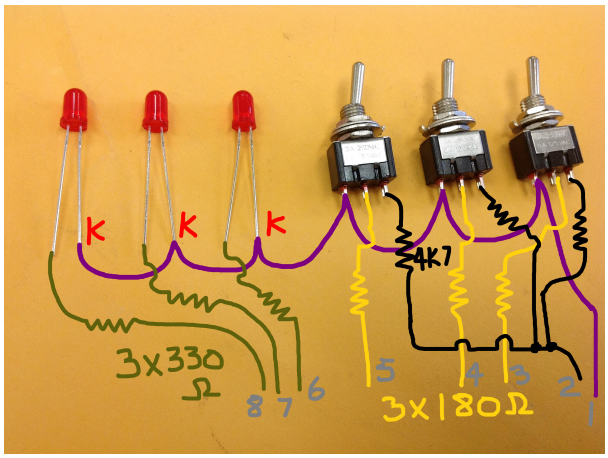
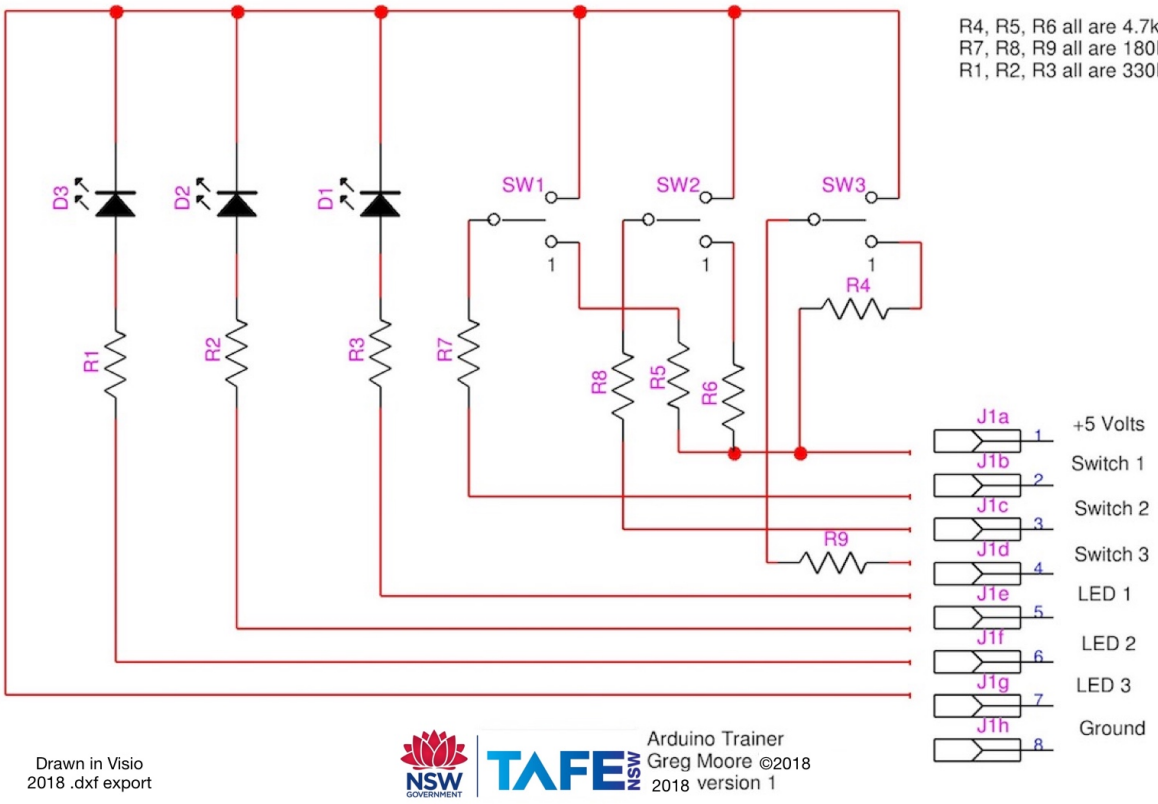
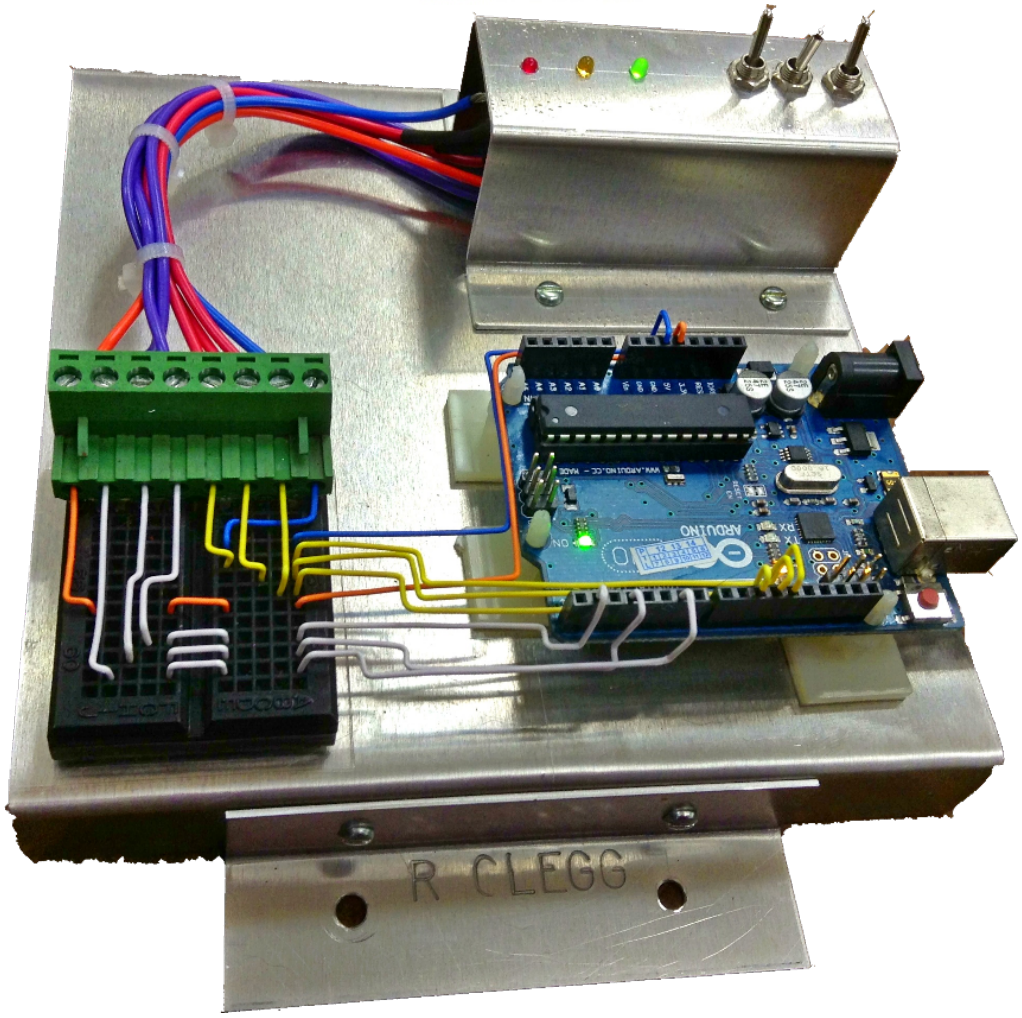
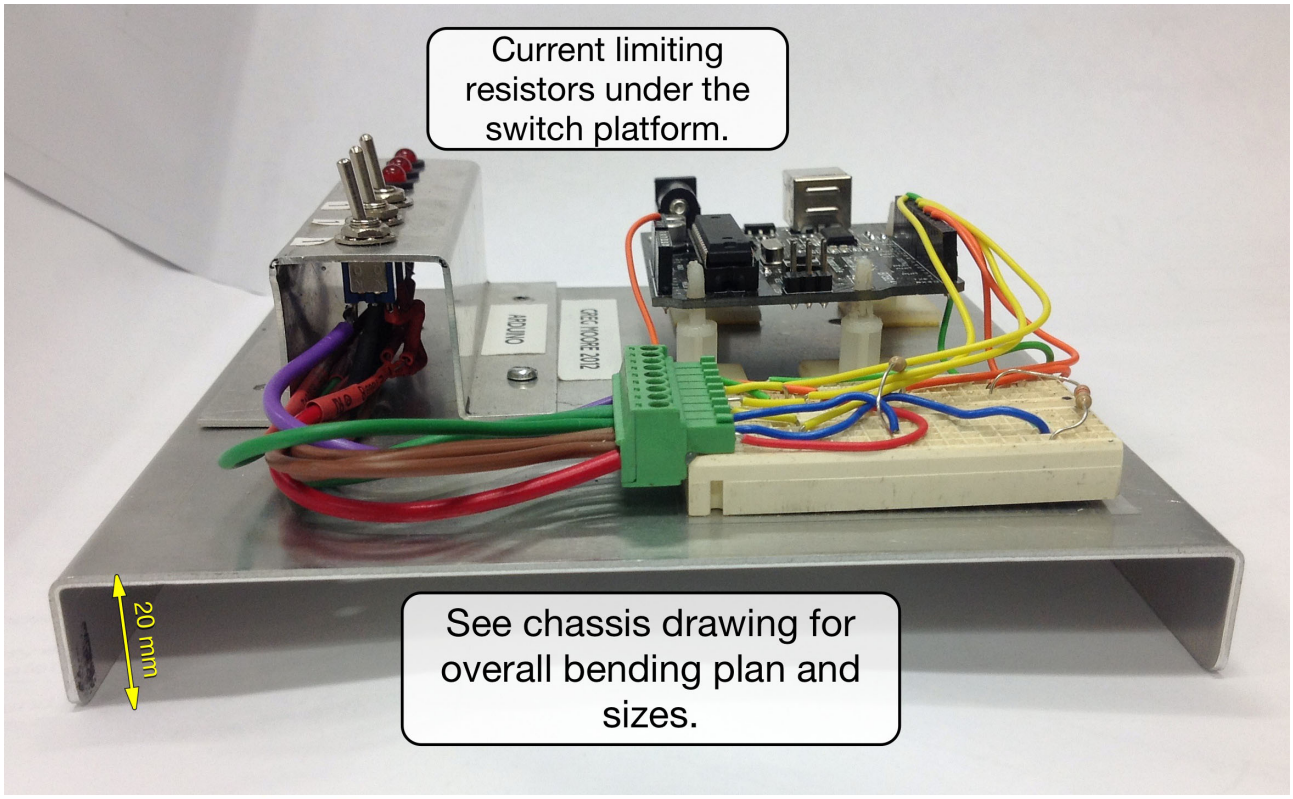


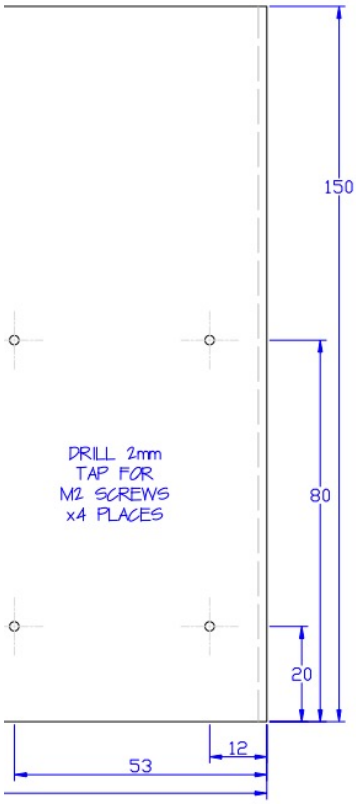


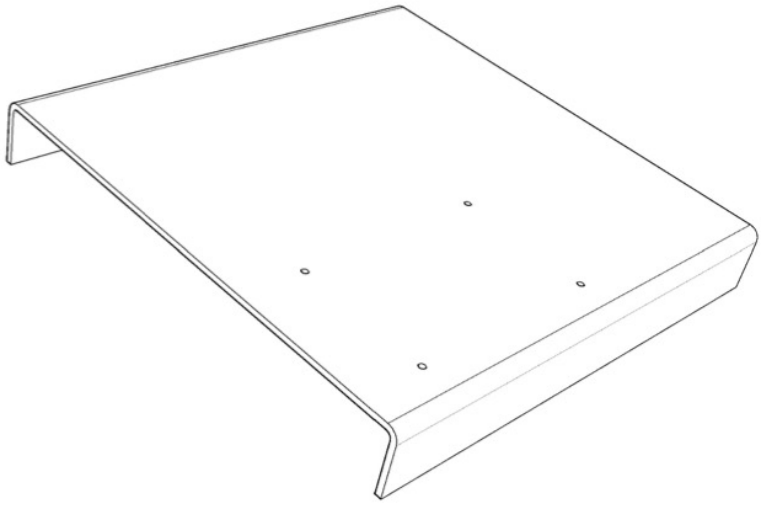


Neatness! If it's not neat like this… expect to be not competent in this unit.

2018 V1.1 (including H181A)



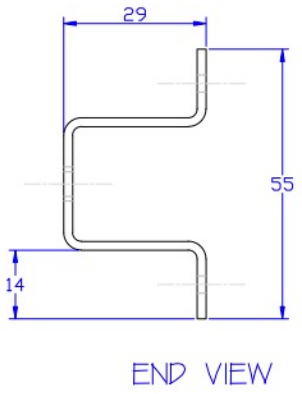




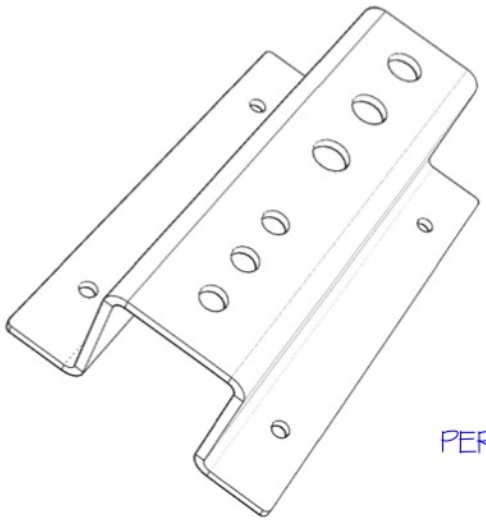
PERSPECTIVE VIEW

NOT TO SCALE

CAD is expected in all workplaces now days. As a TAFE NSW student you can download a free version of Autodesk products and they are quite easy to learn with videos in YouTube etc.



END VIEW



PERSPECTIVE VIEW
NOT TO SCALE

A very neat final project by a previous student. Note the chassis matches the CAD.

NOTE: If you are going to make a PCB for UEENEEH181A, please discuss this with your assessor.

Program

Following is the schedule you should follow to plan the project

– Task 1: Describe the product
– Task 2: Develop a Project Plan
- Task 3: Design Circuit Diagram, and Develop a Bill of Material order parts
- Task 4: Design and make the prototype PCB / tagstrip / Chassis
- Task 5: Build the circuit and test it
– Task 6: Complete documentation and submit
– Task 7: Combined product display and results

Marking scheme

Total of 100 marks available for this assignment

Task 1: Describe the product	(10 Marks)
Task 2: Develop a Project Plan	(10 Marks)
Task 3: Design Circuit Diagram, and Develop a Bill of Material to order parts	(20 Marks)
Task 4: Design and make the prototype PCB	(20 Marks)
Task 5: Build the circuit and test	(20 Marks)
Task 6: Complete documentation and submit	(10 Marks)
Task 7: Combined product display	(10 Marks)

Task1. Describe the product (10 marks)

Unit No	Assessment item	Outcome
UEENEEH141A	T1.Electronic/computer systems industry sector customs and practices	
	Element 1.1 , 1.2	
	T2. Defining project parameters	
	T4. Financial management	
	T8. Risk management and contingencies	
	T11. Contracts	
UEENEEH181A -	Design electronic printed circuit boards	
	Element 1.1 , 1.2	
	T1. Component specifications and their implication in a given circuit.	
	T2. Sources of components and technical data	
UEENEEH188A -	Design and develop electronics – computer systems projects	
	Element 1.1, 1.2, 1.3, 1.6	

Note: if you are not doing UEENEEH181A, ignore the reference to that.

Under this task you are required to write a specification for an electronic/ computer system product.

In this section the above aspects of the relevant units will be assessed. Please refer to the unit guide for each unit for detailed information under each assessment item.

Please follow the instructions when writing your product specification, these instructions and questions are designed to guide you through the steps to comply with the assessment criteria.

Steps
Select a simple product which will be useful in your day to day life or preferably useful in your workplace.

The product should have a number of integrated circuits, BJT, FET and numerous passive components so that it will be reasonable to assess competency for the units covered in this class. Number of passive components will be determined by the design.

Before proceeding with the design, discuss your idea with the teacher and obtain approval to proceed.

Then write a specification covering the following topics.

Product Introduction
Functional description
Illustration of the product, aesthetics, size, shape dimensions etc.
Performance: operating environment, temperature, EMC EMI Safety etc.
Estimated cost: Material cost for PCB and the chassis / enclosure
Compliance testing: parameters to be tested to prove your product performance.
Risk management guidelines for the fabrication of the chassis
Risk management guidelines for the wiring and final assembly
Risk management guidelines for the turn on and subsequent operation of the final project.

Complete the task and submit the outcome, remember to mark your name and student number in the footer of the document

Task 2: Develop a Project Plan (10 Marks)

Unit No	Assessment item	Outcome
UEENEEH141A	T1. Electronic/computer systems industry sector customs and practices	
	Element 1.3, 1.4,1.5, 1.7, 1.8	
	T3. Time management -	
	T6. Human Resource management	
	T7. Communication management	
	T10. Physical Resource management -	
UEENEEH181A	Design electronic printed circuit boards	
	Element 1.4	
UEENEEH188A -	Design and develop electronics – computer systems projects	
	Element 1.4, 1.5,	

Note: if you are not doing UEENEEH181A, ignore the reference to that.

Develop the Work Breakdown Structure, that is list all actions / tasks you have to do in order to complete the project,

You may add or delete some tasks in future

Identify the time required to complete each task and organise them in a sequential manner, identifying predecessor and successor.

Use Microsoft Project, OmniPlan, or similar program to develop your project plan.

Once you have the completed project plan, take a printout or a soft copy including gantt chart and network diagram as a .pdf file

Complete the task and submit the outcome, remember to mark your name and student number in the footer of the document

Task 3: Design Circuit Diagram (20 Marks)

UEENEEH141A	T1. Electronic/computer systems industry sector customs and practices	
	Element 2.1	
	T5. Quality management	
	T9. Procurement management	
UEENEEH181A	Design electronic printed circuit boards	
	Element 1.3, 1.4,2.1, 2.2,2.3	
UEENEEH188A -	Design and develop electronics – computer systems projects	
	Element 2.1 2.2, 2.3,2.4, 2.5,2.6	

Note: if you are not doing UEENEEH181A, ignore the reference to that.

Develop the circuit diagram of the product using circuit maker or iCircuit or even Visio. Print all circuits as a .jpg for including in your project report.

Test your design concept by prototyping it to prove the concept. Once it is functioning satisfactorily, create a printed copy of the schematic diagram.

Develop a draft Bill of Material and submit it to the teacher to source components. This list may not be perfect, the idea is to find parts and build a prototype in parallel with the design.

Complete the task and submit the outcome, remember to mark your name and student number in the footer of the document

Task 4: Design and make the prototype PCB (20 Marks)

UEENEEH141A	T1. Electronic/computer systems industry sector customs and practices	
UEENEEH181A	Design electronic printed circuit boards	
	Element 2.4, 2.5,2.6, 3.1, 3.2	
	T3. Printed circuit board techniques	
	T4. Factors influencing design	
	T5. Design tools and software	
	T6. Design standards	
	T7. MSDS materials and processes	

Note: if you are not doing UEENEEH181A, ignore the reference to that.

Use the tested circuit to develop a Printed Circuit Board.

Make the PCB using Circuit Cam and Board Master or any proprietary PCB software. You have the option to order a board from local or overseas after giving the fabrication company the PCB files which you have produced.

Complete the task and submit the outcome, remember to mark your name and student number in the footer of the document

Task 5: Build the circuit and test it (20 Marks)

UEENEEH141A	T12. Performance assessment	
	T13. Engineering ethics principles	
	T14. Customer/Client relations	
UEENEEH188A -	Design and develop electronics – computer systems projects	
	Element 2.5, 2.6	

Note: if you are not doing UEENEEH181A, ignore the reference to that.

Build the circuit and test it for functionality
Prove the design by testing critical parameters,

Ensure the product has no problems with electrical interference, and no unwanted signals emitted which can interfere with other devices.

You may have to repeat some of the work if you find issues with the design, or if you want to add improvements to the product.

Document your test results and observations as a test report.

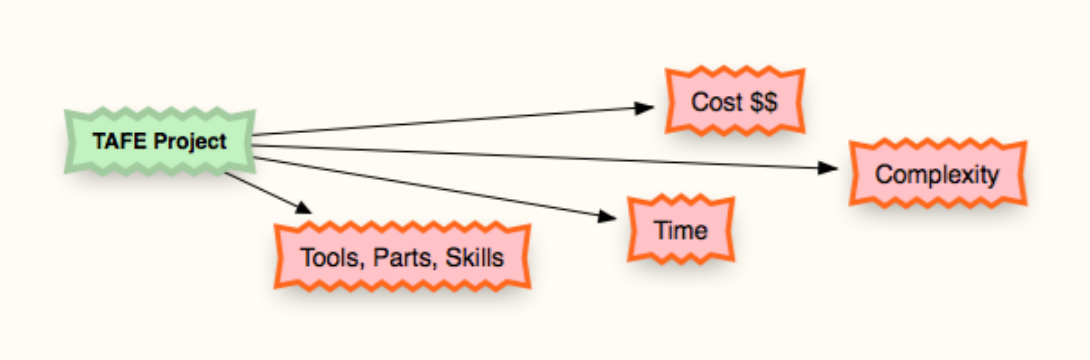
Complete the task and submit the outcome, remember to mark your name and student number in the footer of the document

Task 6: Complete documentation (10 Marks)

UEENEEH141A	T12. Performance assessment	
	T13. Engineering ethics principles	
	T14. Customer/Client relations	
UEENEEH181A	Design electronic printed circuit boards	
	Element 3.3	
UEENEEH188A -	Design and develop electronics – computer systems projects	
	Element 2.7, 2.8, 3.2, 3,3	

Note: if you are not doing UEENEEH181A, ignore the reference to that.

Compile all your documents and make the final submission with functioning product.



Task 7: Product display and results (10 Marks)

UEENEEH141A	T14. Customer/Client relations	
UEENEEH181A	Design electronic printed circuit boards	
	Element 3.4	
UEENEEH188A -	Design and develop electronics – computer systems projects	
	Element 3.1, 3.4	

Note: if you are not doing UEENEEH181A, ignore the reference to that.

You should demonstrate the functional product to the teacher and the class once you complete the product development

A PowerPoint presentation of your project in step by step detail would be the suggested method to help you demonstrate your final project.

Submission

Submit compiled report and produce the product developed for assessment on or before the date which you have negotiated with your assessor