# Task

**Task**

You have been tasked with creating a **showcase of your learning**. Your showcase will use the focus on a **Tool of Learning**, the the prototyping of a remote control car, to learn different aspects of cyber security. The default showcase will be an **A2 poster** of your learning and **one recorded presentation** for a general audience

# Tool of learning

The focus of this body of work will be the prototyping of a remote control car using Arduino microcontrollers and a range of sensors/actuators available in the lab. It is intended that this car is as working as possible.

# Tasks for learning and submission

* Planning document which is focused on the main problems that need to be solved
* The creation and delivery of a prototype which attempts to complete the main problems of a remote control car.

**Main problems to be addressed**: user-control | user-interface | steering | communication between controller and car | physical body | integration of these aspects

# Showcase Responses

Your poster and presentations must respond to three statements and present different levels of information to describe what it is you learnt and how that knowledge can be used in robotics and mechatronics.

The statements will be provided in the rubric below. You must address your responses to the three audiences:

1. Poster – summarise your learning for general audiences in a condensed writing environment
2. General audience presentation – simulates presenting your work and learning to a general audience and allows for some extrapolation

Your general audience presentation should be **no more than 5 minutes**.

##### Section 1: Knowledge Comprehension, and Application

This section of the rubric consists of the required elements of the assignment. Students should take special care to include ALL these elements as they are often extended in the following sections

##### Section 2: Analysis, Synthesis, and Evaluation.

This section will evaluate your ability to include critical thinking and justification elements into your work. Often the requirements for extension are not explicitly given, so it will be up to the you to decide how best to demonstrate what you have learned beyond the required unit goals and curriculum. Items such as 3D models, pictures, drawings, diagrammatic responses, notes, evidence of problem solving, advanced programming concepts, elegant responses, media, etc., are all available options.

##### Section 3: Submission Guidelines

For this section, students will be expected to provide a submission which fulfills all of the formatting and citation requirements listed in this assessment sheet but also that the submission is of a professional quality. Be aware, points in this section could be 2- or 4-point items. Treat them accordingly.

## Submission

All submission items should be stored in an appropriate format. For example, code must be stored in a programmatical format so it can be evaluated (**images of code, or code simply copied and pasted into a document, will not be marked**)

Evidence of working material must be recorded where appropriate. For example, if you are showing how your game meets some requirement, you must submit a recording. Similarly, if you are showing how your robot meets a requirement, you must record it.

If you are unsure if an element needs to be recorded, **ask the teacher.**

All materials must be submitted to google classrooms.

Students are responsible for keeping backups/master-copies.

## **Scoring Notes**

Formatting for all typed/written assessments should be as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Google Doc** | 11-12 Pt | 1.15-1.5 Line Spacing | 1 Space between paragraphs | Spelling and Grammar “Soft Limit” | In-Text Citations with footnotes | Title Page/Slide:   * Name * Date * Class * Aim * Assessment title |
| **Slides** | 10-12 pt. font text  14-24 pt. font titles | 1.0 1.15 Line Spacing | Bullet Points Preferred | Word Count per slide >100-110 “Soft Limit” | Approved Templates and Themes |
| **Python** | We apply the following style guide to Python files. However, in general most programs follow this broad layout.    [PEP 8: The Style Guide for Python Code](https://pep8.org/) | | | | | |
| **Arduino**  **C/C++** | We apply the following style guide to C/C++ files. However, in general most programs follow this broad layout.    I accept both K&R and K&R alternative bracing format. As long as it is consistent in your file.  [Arduino Style Guide for Creating Libraries | Arduino Documentation | Arduino Documentation](https://docs.arduino.cc/learn/contributions/arduino-library-style-guide) | | | | | |
| **Markdown** | We apply the following style guide to markdown documents. However, in general, most documents follow some variation of the following layout:    <https://github.com/google/styleguide/blob/gh-pages/docguide/style.md> | | | | | |

“Soft Limits” are not rigidly defined limits and will be assessed on a case-by-case basis. Ask for clarification for specific tasks

## Possible Scoring Groups are out of 2 or 4 Points.

**2-Point Criteria - Knowledge and Understanding**

Criteria assessed as 2-Points are classified as Knowledge and Understanding criteria. These will examine and evaluate a student’s ability to state facts and define terms and concepts effectively. Analysis and synthesis of the information will not be assessed through these criteria.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **0 Points** | **1 Point** | **2 Points** |
| **2 Point Criteria** | **Not present** or **not able to be assessed** as the required criteria | Item is presented but **does not meet expectations** for quality, rigour, or detail. | Item is presented and **does meet expectations** for quality, rigour, or detail |

**4-Point Criteria - Analysis and Synthesis and Expert Review**

To show true mastery of your developing skills, students must show that they can go beyond simple repetition of the given tasks or an explanation of processes. Students will show their ability to show higher order thinking through analysis, evaluation, or the linking of multiple fields of learning to solve problems in novel ways.

**Analysis and Synthesis**

Analysis and Synthesis components evaluate a student’s ability to effectively review data and understandings and develop these into a coherent and relevant statement. Analysis refers to the generating of thoughts from interpreting the data, while synthesis refers to combining analysis of the data with other relevant information to develop an original and effective idea.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **0 Points** | **1 Point** | **2 Points** | **3 Points** | **4 Points** |
| **4 Point Criteria** | **Not present** or **not able to be assessed** as the required criteria | Item is presented and explained. However, it **does not show appropriate evidence of higher order thinking** such as analysis, evaluation, or synthesis. | Item is presented and **shows appropriate evidence of higher order thinking** such as analysis, evaluation, or synthesis. | Item is presented and **exceeds expectations for evidence of higher order thinking** such as analysis, evaluation, or synthesis.  **-or-**  Item is presented and shows appropriate evidence of higher order thinking such as analysis, evaluation, or synthesis and **exceeds expectations for quality or rigour**, of understanding of the selected mastery. | Item is presented and **exceeds expectations for evidence of higher order thinking** such as analysis, evaluation, or synthesis. **Additionally, this item exceeds expectations for quality or rigour**, of understanding of the selected mastery. |

**Expert Review**

Expert Reviews evaluate a student’s ability to build solutions using the skills that have been taught during the semester. Criteria assessed as 4-Points are classified as Analysis and Synthesis criteria. These will examine and evaluate a student’s ability to effectively review data and understandings and develop these into a coherent and relevant statement. Analysis refers to the generating of thoughts from interpreting the data, while synthesis refers to combining analysis of the data with other relevant information to develop an original and effective idea.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **0 Points** | **1 Point** | **2 Points** | **3 Points** | **4 Points** |
| **4 Point Criteria** | **Not present** or **not able to be assessed** as the required criteria | Item is presented and broadly solves the problem. However, upon review, it **does not show enough evidence of appropriate mastery**. | Item is presented and broadly solves the problem. On review, it **does show appropriate evidence** of mastery. | Item is presented and solves the specific problem. On review, the evidence **shows understanding beyond expected mastery**.  **-or-**  Item is presented and broadly solves the problem. On review, it does show appropriate evidence of mastery and is **done so in a well-constructed or design method** that clearly shows higher levels of understanding**.** | Item is presented and solves the specific problem. On review, **the evidence shows understanding well beyond expected mastery** and is **done so in a well-constructed or design method** that clearly shows higher levels of understanding. |

**Multiplier**

Criteria will be combined with a **Multiplier**. While each criterion will be scored on the 0-1-2-4 scale, the multiplier will attach relevant worth to each criterion. Be aware of these multipliers and dedicate appropriate time to ensure you achieve your best result.

**Achievement Standards:**

##### Evidence of higher order learning:

What is it that I mean by “higher order thinking”?

It means I want you to go beyond just replicating what we do in class. I want you to dig into your brain and understand why you did something, what about it was great, what could be improved.

Why is this important? Reflective thinkers can go beyond what they are taught and can customise their learning to ben



## Rubric

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Knowledge, Comprehension & Application** |  |  |  |  |  |
| **CRITERIA** | **EXPECTATIONS** | **POSS** | **STUDENT** | **GIVEN** | **MULTI** | **TOTAL** |
| **Planning Document**  (group) | **You have submitted evidence** of completing the required learning material.  This evidence is presented appropriately (**Markdown**) unless negotiated for a different format.  Your planning document **identifies how you intend to solve the main problems** of the challenge.   * How will someone control your car? * How will your car respond to controls? * How do you integrate solutions?   Evidence for knowledge, comprehension, and application may include:   * **Knowledge**: Your evidence highlights that you recall and list relevant terms covered in your learning. It may tell a story to the reader (the teacher) or state your learning conditions. * **Comprehension**: Your evidence highlights that you can identify key aspects of your learning or explain what you've done to the teacher. * **Application**: It is clear from your evidence that you constructed a complete submission | 2  2  2 | \_\_/2  \_\_/2  \_\_/2 | \_\_/2  \_\_/2  \_\_/2 | Ax2  Tx1 | A\_\_/12  T\_\_/ 6 |
| **Prototype**  **(group)** | You have submitted evidence of your remote control car being constructed.  Your evidence consists of Arduino files and a video of your Arduino based car and controller in action (or as much action as we can manage 😊).  Evidence for knowledge, comprehension, and application may include:   * **Knowledge**: Your evidence highlights that you recall and list relevant terms covered in your learning. It may tell a story to the reader (the teacher) or state your learning conditions. * **Comprehension**: Your evidence highlights that you can identify key aspects of your learning or explain what you've done to the teacher. * **Application**: It is clear from your evidence that you constructed a complete submission | 2 | \_\_/2 | \_\_/2 | A x2  T x1 | A\_\_/ 4  T\_\_/ 2 |
| **Showcase**  (individual) | You have submitted evidence of your showcase. By default, your showcase responds to each of the three questions highlighted below. However, these questions can be negotiated or reframed with your teacher.   To achieve a passing grade (2) you must submit a serious attempt to respond to each question in each medium. By default, your submission for the showcase would be the given poster template, and both presentations   * Showcase poster * General Audience Presentation   The output can be negotiated with the teacher. Previous submissions have allowed for Google Sites, HTML, or Markdown documents.  Evidence for knowledge, comprehension, and application may include:   * **Knowledge**: Your evidence highlights that you recall and list relevant terms covered in your learning. It may tell a story to the reader (the teacher) or state your learning conditions. * **Comprehension**: Your evidence highlights that you can identify critical aspects of your learning or explain what you've done to the teacher. * **Application**: It is clear from your evidence that you constructed a complete submission | 2  2 | \_\_/2 \_\_/2 | \_\_/2 \_\_/2 | A x2  T x1 | A\_\_/ 8  T\_\_/ 4 |
|  | **Analysis, Synthesis & Evaluation** |  | | **SUB TOTAL** | | **A \_ / 24**  **T \_ / 12** |
| **Statement 1** | **Statement**: What was your project? How did it work? How did you design your interfaces, control systems, and system?  Learning to build stuff can be fun, but it was educational and why could it be essential that learners learn through play?  Statement responses are used to evaluate your ability to **analyse your learning**, identify **how and when you synthesised new understanding** on your own, and your ability to **reflect upon your work**  Showcases are a tool **you use to highlight your learning to different audiences**. Learning how to **reflect on what you learnt** during your assessments and **identifying** what parts of your work were **high quality** and what you could do **to improve** your work is an **essential aspect of education**.  This question will be marked against the following aspects of your ability to:   * To **summarise your understanding of technology** concepts and principles to a general audience * express **your understanding of technology** concepts and principles to a general audience * **your ability to communicate your learning** appropriately to experts   Evidence for higher-order learning may include:   * **Analysis**: Your evidence shows a reasoned understanding of what you did and why. For example, you may have explained how you did X, Y, and Z, but you continue to explain why you did them the way you did. * **Evaluative**: your evidence makes a judgement of something or between multiple things. This judgement may be the value of one thing over another or highlighting the significant differences between two things. * **Transferal**: your evidence highlights when you apply information, strategies, or skills that you have learnt to a new situation or context. | 4 | \_\_/4 | \_\_/4 | - | \_\_ / 4 |
| **Statement 2** | **Statement**: What are the challenges of incorporating/applying a diverse range of concepts, principles, and theories to solve a complex problem?  Learning to build stuff can be fun, but as our knowledge of programming and mechatronics grows, the number of abstractions we ned to incorporate becomes more complex. Tell us how you managed all of this, what went right, what didn't go so well, and how would you manage this in the future?  Statement responses are used to evaluate your ability to **analyse your learning**, identify **how and when you synthesised new understanding** on your own, and your ability to **reflect upon your work**  Showcases are a tool **you use to highlight your learning to different audiences**. Learning how to **reflect on what you learnt** during your assessments and **identifying** what parts of your work were **high quality** and what you could do **to improve** your work is an **essential aspect of education**.  This question will be marked against the following aspects of your ability to:   * To **summarise your understanding of technology** concepts and principles to a general audience * express **your understanding of technology** concepts and principles to a general audience * **your ability to communicate your learning** appropriately to experts   Evidence for higher-order learning may include:   * **Analysis**: Your evidence shows a reasoned understanding of what you did and why. For example, you may have explained how you did X, Y, and Z, but you continue to explain why you did them the way you did. * **Evaluative**: your evidence makes a judgement of something or between multiple things. This judgement may be the value of one thing over another or highlighting the significant differences between two things. * **Transferal**: your evidence highlights when you apply information, strategies, or skills that you have learnt to a new situation or context. | 4 | \_\_/4 | \_\_/4 | - | \_\_ / 4 |
| **Statement 3** | **Statement**: The previous assessment item asked students to become an expert on one feature of a remote control car. Review some of the tutorials students generated and identify what you could have used to enhance your tutorials. This enhancement could be good things you should include in the future or a 'here be dragons' moment.  Feel free to compare and contrast your work or others. What worked in them and what didn't work.  Statement responses are used to evaluate your ability to **analyse your learning**, identify **how and when you synthesised new understanding** on your own, and your ability to **reflect upon your work**  Showcases are a tool **you use to highlight your learning to different audiences**. Learning how to **reflect on what you learnt** during your assessments and **identifying** what parts of your work were **high quality** and what you could do **to improve** your work is an **essential aspect of education**.  This question will be marked against the following aspects of your ability to:   * To **summarise your understanding of technology** concepts and principles to a general audience * express **your understanding of technology** concepts and principles to a general audience * **your ability to communicate your learning** appropriately to experts   Evidence for higher-order learning may include:   * **Analysis**: Your evidence shows a reasoned understanding of what you did and why. For example, you may have explained how you did X, Y, and Z, but you continue to explain why you did them the way you did. * **Evaluative**: your evidence makes a judgement of something or between multiple things. This judgement may be the value of one thing over another or highlighting the significant differences between two things. * **Transferal**: your evidence highlights when you apply information, strategies, or skills that you have learnt to a new situation or context. | 4 | \_\_/4 | \_\_/4 | - | \_\_ / 4 |
| **Audio Presentation** | **You have submitted evidence of a presentation**. This presentation is **intended to be spoken** but can be negotiated. The presentation elevates the poster **by providing additional information via extrapolation** of the facts included in the poster.  **The presentation is not long**. No more than 5 minutes. You pitched your **presentation as if it could replace a physical showcase**. The production recording itself is not being assessed; instead, you will **be evaluated on your ability to extrapolate and expand your content** to expand the significant points to provide more details briefly.  Showcases are a tool **you use to highlight your learning to different audiences**. Learning how to **reflect on what you learnt** during your assessments and **identifying** what parts of your work were **high quality** and what you could do **to improve** your work is an **essential aspect of education**.  This question will be marked against the following aspects of your ability to:   * To **summarise your understanding of technology** concepts and principles to a general audience * express **your understanding of technology** concepts and principles to a general audience * **your ability to communicate your learning** appropriately to experts   Evidence for higher-order learning may include:   * **Analysis**: Your evidence shows a reasoned understanding of what you did and why. For example, you may have explained how you did X, Y, and Z, but you continue to explain why you did them the way you did. * **Evaluative**: your evidence makes a judgement of something or between multiple things. This judgement may be the value of one thing over another or highlighting the significant differences between two things.   **Transferal**: your evidence highlights when you apply information, strategies, or skills that you have learnt to a new situation or context. | 4 | \_\_/4 | \_\_/4 | A x1  T x2 | A \_\_ / 4  T \_\_ / 8 |
|  | **Submission Guidelines** |  | | **SUB TOTAL** | | **A \_\_/16**  **T \_\_/20** |
| **Readability** | **Assessment submission is ordered** and has a definite pattern to its construction. **The reader is not confused about the content in any given section and can easily follow the submission flow**. | 4 | \_\_/4 | \_\_/4 | X2 | \_\_ / 8 |
| **Formatting** | **Students have** **followed the formatting instructions,** including any provided templates and guides, or created their own legible formatting guide **and applied it constantly**. | 2 | \_\_/2 | \_\_/2 | - | \_\_ / 2 |
|  |  |  | | **SUB TOTAL** | | **\_\_ /10** |
|  | DAYS LATE \_\_\_/7 = \_\_\_% |  |  | **FINAL** | | **A \_\_/50 T \_\_/42** |

## VET Competencies

|  |  |  |  |
| --- | --- | --- | --- |
| Result | Vocational competencies assessed via this task | | Aspect of task addressing competency |
|  | BSBOHS201A | Participate in OHS processes | Proper use of equipment & evacuation drills |
|  | ICAICT202A | Work and communicate effectively in an IT environment | Researching, creating, printing & submitting of Research Report |
|  | ICAICT201A | Use Computer Operating System and Hardware | Participation in organised IT activity & researching & creating report |