

Engineers Australia Stage 1 Competencies Overview		Practice Report		
Section 1. Knowledge and Skill base		#1	#2	#3
1.1	Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.		X	
1.2	Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline	X		
1.3	In-depth understanding of specialist bodies of knowledge within the engineering discipline.		X	
1.4	Discernment of knowledge development and research directions within the engineering discipline.		X	
1.5	Knowledge of engineering design practice and contextual factors impacting the engineering discipline.		X	
1.6	Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline.			X
Section 2. Engineering Application Ability				
2.1	Application of established engineering methods to complex engineering problem solving.	X		
2.2	Fluent application of engineering techniques, tools and resources.		X	
2.3	Application of systematic engineering synthesis and design processes.	X		
2.4	Application of systematic approaches to the conduct and management of engineering projects.			X
Section 3. Professional and Personal Attributes				
3.1	Ethical conduct and professional accountability.			X
3.2	Effective oral and written communication in professional and lay domains.	X		
3.3	Creative , innovative and pro-active demeanour.		X	
3.4	Professional use and management of information.			X
3.5	Orderly management of self, and professional conduct.	X		
3.6	Effective team membership and team leadership.			X

Professional Practice Report #1: Software Prototype	
Organisation	Gilmour Space Technologies
Location	5 Millennium CCT, Helensvale, QLD
Supervisor	Mr. Alex Forward
Dates	21/11/2023 – 24/2/2023
Title / Role	Avionics Engineer Intern
Category	A

Description	Competency Claimed
<p>During my IAP placement in 6002ENG, I worked at Gilmour Space Technologies as an avionics intern. This was part of the Defence Industry Internship Program where I completed 450 hours of category A work experience. Gilmour Space Technologies is an Australian launch vehicles company with the goal of developing Australia's sovereign launch capabilities with the immediate goal of launching Australia's first rocket with orbital capabilities, namely Eris 001. The three reports in this competencies task will cover the projects and experiences I gained during this internship. The first report will cover my experience designing and developing a software prototype for a remote data acquisition unit for the purposes of monitoring the health of battery management systems (BMS) for propulsion batteries via CAN bus interface. This involved writing test software, outlining system requirements, communicating with industry manufacturers and developing high quality engineering documents.</p>	<p>Introduction</p>
<p>At the initial stages of my internship, I was tasked with researching and understanding the physical layout of the Controller Area Network (CAN) bus and the characteristics of its data transmission. The goal was to design software that could sniff Battery Management System (BMS) packets and decode them into information such as module voltage, cell voltage, and cell temperature.</p> <p>To fulfill this task, I needed to master the complexities of CAN bus data transmission and the nuances of C++. I also had to familiarize myself with the company's IDE, CLion, as well as learn about CMake and XML files to segment my software applications into manageable elements.</p> <p>I set about developing my understanding of packets, endianness, hexadecimal addressing, and protocols for decoding data from CAN frames by conducting extensive research and seeking assistance from colleagues across multiple engineering departments. Additionally, I deepened my knowledge of C++ and studies the functions and benefits of CMake and XML files, focusing on how they enabled integrated test executables.</p> <p>By combining research-based knowledge and established engineering methods, I successfully designed an architecture for software testing and debugging within my project's software environment. This project gave me practical exposure to the intricacies of problem-solving in the engineering domain, from making substantiated conclusions based on analysis to integrating systems for optimal performance.</p> <p>The experience reinforced the importance of grounding all aspects of engineering activities in fundamental principles, while also flexibly adapting to new tools and languages. The ability to manage complex engineering problems, particularly those involving ambiguity and imprecise information, was further developed. Looking ahead, I'll carry forward this enriched understanding of technical research, risk management, and problem partitioning into future engineering challenges.</p>	<p>2.1 Application of established engineering methods to complex engineering problem solving.</p> <p>- Added STARL framework</p>
<p>After researching and outlining my software tests, I progressed to the development of software requirements for my applications. I realised the</p>	<p>2.3 Application of systematic</p>

<p>critical role of these requirements in software development, as communicated by the experienced software engineers on my team.</p> <p>The challenge was to identify and implement software requirements for various test case scenarios including packet identification, operating at a speed of 1Mbps, and establishing scalable BMS identifier conventions. Alongside, I was required to classify these requirements into functional and non-functional frameworks.</p> <p>I applied the systematic engineering synthesis and design process to tackle this task, prioritising client requirements and contextual factors like projected development constraints. This involved following a whole systems design cycle approach, where I began with eliciting, scoping, and documenting the desired outcomes of the design task, along with defining the acceptance criteria.</p> <p>The software requirements were formulated and partitioned into functional and non-functional elements for better manageability. Then, these were uploaded to my project's GitLab repository, ensuring that the design process was transparent and accessible to the entire team for seamless integration and collaboration.</p> <p>This experience instilled in me a profound understanding of the accountabilities of a professional engineer, especially concerning the 'design authority' role. In future projects, I will continue to focus on comprehensive planning, risk assessment, and the development of clear, actionable requirements in my design processes. The use of modular, functional elements and the implementation of optimal design approaches will remain central to my approach, ensuring compliance with essential engineering standards and practices.</p>	<p>engineering synthesis and design processes.</p> <p>- Added STARL framework</p>
<p>Upon outlining the software requirements, the next phase of my project entailed the development of my test applications, including an LCM output message receiver. This process demanded a comprehensive understanding of mathematical and computational principles to devise effective tools and techniques pertinent to the engineering discipline.</p> <p>My task was to test these applications using a virtual CAN socket connection and develop a DBC file, which required direct coordination with the BMS manufacturer. I also had to establish efficient knowledge management and communication tools, necessitating an in-depth understanding of the missing product specifications from the BMS data sheet.</p> <p>To address these issues, I contacted the BMS manufacturers. This was my first interaction with industry-level suppliers, providing insights into the operational level of such companies. Following several communications, I finally received the requisite information which allowed me to apply appropriate variable types for the BMS packets in my software.</p> <p>I integrated the acquired data into my LCM receiver application, which was designed to receive incoming LCM packets and display a live feed of BMS</p>	<p>1.2 Conceptual understanding of mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.</p> <p>- Added STARL framework</p>

<p>decoded values over a continuous time spectrum. As part of this, I leveraged existing tools and resources created by the software team, integrating them with my applications.</p> <p>Through this process, I was successful in developing and testing my applications. The tests allowed me to take packet measurements and evaluate the effectiveness of my application based on supportive data modelling. This entire process enhanced my understanding and application of the mathematical, numerical analysis, and computer sciences that underpin my engineering discipline.</p> <p>Reflecting on this experience, I gained valuable skills in handling industry-level communications, developing software requirements, and applying relevant tools and techniques to solve complex engineering problems. In future scenarios, I plan to apply these learnings, emphasizing efficient knowledge management and seamless communication. I will strive to further improve my conceptual understanding of the foundational disciplines that underpin my engineering practice.</p>	
<p>During my internship I encountered a challenge involving a lack of necessary information in the product data sheet provided by the BMS suppliers and manufacturers. This was my first professional experience dealing with external vendors. Furthermore, as my work email was set up and included the company logo, I understood that my interactions reflected my company's professional image.</p> <p>At first, I was frustrated with the situation – the incomplete documentation and delayed email responses from the manufacturers. However, I realized the importance of maintaining a professional demeanour despite the challenges. As a representative of my company, I had an obligation to foster a positive working relationship with our vendors.</p> <p>To navigate this situation, I had to manage my response carefully. I communicated with the BMS suppliers in a respectful and professional manner, despite my initial frustration. I ensured to present a consistent professional image in all correspondences, understanding the need to uphold a strong relationship with technical colleagues.</p> <p>This experience was instrumental in my professional development. It was a practical lesson in the importance of professional conduct and reinforced the need to manage myself orderly in all circumstances, regardless of the challenges encountered. I learned that presenting a professional image is critical, not only in direct relationship with clients and stakeholders but also with professional and technical colleagues across various disciplines.</p> <p>Moving forward, I will apply this learning to future situations, mindful of the impact of my conduct on the professional image of myself and the organizations I represent. This commitment to professional development and life-long learning will continue to guide my career progression in the engineering field.</p>	<p>3.5 Orderly management of self, and professional conduct.</p> <p>- Added STARL framework</p>
<p>During my internship at Gilmour Space Technologies, I was entrusted with the task of developing test applications for my software.</p>	<p>3.2 Effective oral and written</p>

<p>My responsibilities included not only writing high-quality software, but also generating detailed documentation including design requirements, software specifications, diagrams, and technical descriptions. I was also involved in presenting my work progress to the team and senior engineers.</p> <p>After completing my test applications, I developed comprehensive engineering documents following the advice of a senior software engineer. I was proficient in comprehending and utilizing his advice about the structure and contents of these documents, ensuring that they were pertinent to the functionality of my code. Once the engineer approved my documentation, I made it publicly accessible on my project repository.</p> <p>Alongside written communication, I actively engaged in oral communication throughout the project. I regularly participated in team meetings and one-on-one sessions with my mentor, where I presented the progress of my work, discussed potential issues, and suggested solutions. I utilized various media like diagrams and graphical presentations to express technical details effectively to both technical and non-technical audiences. Additionally, I represented an engineering position in broader meetings, debating and negotiating aspects of the project design, which helped me understand the importance of body language, personal behaviour and other non-verbal communication processes.</p> <p>My documentation was acknowledged as being of high engineering standard, marking the successful conclusion of my first professional engineering prototype. My oral communication also improved significantly, evidenced by my active involvement and contribution in discussions and presentations.</p> <p>This experience underscored the significance of both written and oral communication in professional domains. It enhanced my ability to articulate engineering concepts effectively in varied formats, appreciate and utilize feedback, and navigate discussions with technical and non-technical stakeholders. It's a skill set I plan to continue refining in my future engineering roles.</p>	<p>communication in professional and lay domains</p> <p>- Provided example of oral communication</p>
<p>Through the development of this software prototype at Gilmour Space Technologies, I gleaned significant insights that refined my professional engineering competencies. I was able to understand the importance of comprehensive research and meticulous technical planning in developing software applications. I also learned how to identify and outline precise software requirements for diverse testing scenarios. Navigating challenges such as missing product specifications taught me a level of resilience and the value of effective communication. I was able to learn how to maintain professionalism whilst liaising with industry manufacturers and realised the impacts of my conduct on the company's image. I enhanced my skills and knowledge of the C++ language, software testing principles, debugging and document preparation under the mentorship of a senior software engineer. This experience was crucial for me to understand the process of creating high-standard engineering documents and adhering to professional and technical guidelines. In essence, my involvement in this project at my</p>	<p>Conclusion</p>

internship honed my engineering skills, highlighted the necessity of professionalism and underscored the value of effective communication and collaboration in the aerospace industry. It was an invaluable learning experience that has significantly contributed to my professional growth as an engineer.	
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Word count: 1739

Professional Practice Report #2: Hardware Prototype and Final Product	
Organisation	Gilmour Space Technologies
Location	5 Millennium CCT, Helensvale, QLD
Supervisor	Mr. Alex Forward
Dates	21/11/2023 – 24/2/2023
Title / Role	Avionics Engineer Intern
Category	A

Description	Competency claimed
During my category A work experience at Gilmour Space Technologies, I was tasked with taking my software prototype and developing a hardware prototype and final hardware product. The hardware prototype was implemented using a Raspberry Pi, and the final product involved designing a complex PCB. The hardware prototype was implemented using a CAN Pi HAT with a twisted CAN bus transmission line in which I conducted integration testing using a real BMS to test my software applications. The final product involved me learning about PCB design within Altium Designer. This is an industry level software, and the task was highly complicated, but by the end of my internship I was able to send my designs to a manufacture for fabrication.	Introduction
<p>During my internship, the task at hand was to select the optimal microcontroller for a hardware prototype with certain specifications like on-board Rx and Tx for the CAN bus transmission line. This required an understanding of current developments, advanced technologies, and emerging issues within the avionics engineering discipline.</p> <p>Initially, my research involved a comprehensive survey of the landscape of microcontrollers. I narrowed my focus down to the STM32 series from STMicroelectronics and the available Raspberry Pi models, particularly Raspberry Pi 4b. I engaged in a systematic review of recent research literature, where I critically appraised the energy efficiency, computational ability, and CAN compatibility of these devices. I utilized resources such as online academic databases, technical white papers, and recent publications in relevant journals to conduct my research.</p> <p>The literature review revealed that while the STM32 series boasted of superior low power consumption, the Raspberry Pi models offered robust computational abilities and promising CAN capability. Specifically, the Raspberry Pi 4b demonstrated a balanced blend of these desired features. Emerging trends in IoT and embedded systems showed a leaning towards devices that provided this sort of balance, with an added focus on energy efficiency – a factor that was critical to the project.</p>	<p>1.4 Discernment of knowledge development and research directions within the engineering discipline</p> <p>- More specific about meeting the competency.</p>

<p>Based on these insights from my review, I decided to deploy the Raspberry Pi 4b for my hardware prototype. This experience illustrated the importance of rigorous research and literature review in informing engineering decisions. It highlighted the fact that staying informed about current developments and technological advancements in one's specialist domain is paramount to driving efficient and informed engineering solutions. Moving forward, I intend to continue leveraging these research skills in my future engineering projects.</p>	
<p>During my internship, I was tasked with conducting integration testing for y Raspberry Pi hardware prototype. The goal was to evaluate the interface between the microcontroller and batteries in a hardware-in-the-loop (HITL) environment.</p> <p>My challenge was to not only ensure the effectiveness of my test software but also to explore innovative ways of implementing the hardware-software interface for the rocket's power systems.</p> <p>In order to carry out a holistic evaluation, I chose to delve into the performance characteristics of the propulsion batteries and the capabilities of my microcontroller. This approach challenged the traditional method of focusing solely on the software, as I decided to involve hardware factors in the process. For this, I sought out a propulsion engineer who was an expert in the propulsion battery systems. Collaborating with this specialist allowed me to understand the battery system better and integrate that knowledge into my engineering process.</p> <p>I identified the possibility of implementing a Printed Circuit Board (PCB) to improve the hardware-software interface for the rocket's power systems. This creative solution was derived from the innovative process of merging different areas of expertise, which was a deviation from traditional practices. By integrating software and hardware considerations and challenging the conventional practice of software-centric approach, I was able to design an innovative solution for the project.</p> <p>This experience highlighted the importance of a creative, innovative ad proactive demeanour in engineering. It made me realize that challenging traditional practices and being open to ideas from different specializations can lead to effective and innovative solutions. In the future, I will continue to apply a similar creative approach, drawing on knowledge from broader fields of science, engineering, and commerce.</p>	<p>3.3 Creative, innovative and proactive demeanour</p> <p>- Provided specific example of how I met the competency, and with more details.</p>
<p>During my internship, I had the opportunity to design a PCB for the final hardware implementation after successfully completing the prototype hardware integration testing. Despite this being my first experience with PCB development, I was eager to rise to the challenge, and my supervisors were supportive of my endeavour.</p> <p>My task involved identifying and selecting the necessary components for the PCB, a process which required in-depth discussion with my supervisors. We decided to use the layout from the existing Remote Data Acquisition</p>	<p>2.2 Fluent application of engineering techniques, tools and resources</p> <p>- Added STARL framework</p>

<p>Units (RDAU), incorporating CAN chips and optocouplers for BMS relay control.</p> <p>To ensure the system would be compliant with the rocket's maximum internal temperature, I carried out mathematical and physical modelling to analyse the power and thermal profiles of the components and the board's processor. I leveraged my engineering skills to identify their properties, performance, and safe working limits. I familiarised myself with Altium Designer, a new tool for me, for the PCB design. This involved schematic design, physical layout, creating component libraries, and outputting files for manufacturing. I also explored the use of x-signals, a tool that aids in the creation of differential pairs.</p> <p>The culmination of this process was a critical design review presentation I organized for my supervisors. We scrutinized my design choices and calculations, and their feedback led to further refinement of my system. Ultimately, my design received the final approval, a testament to my fluent application of engineering techniques, tools, and resources.</p> <p>From this experience, I learned about the selection and application of materials, components, and systems relevant to the project. I successfully applied a wide range of engineering tools for analysis, simulation, visualization, synthesis and design. Moreover, I practiced the presentation and validation of my work in a professional environment, gaining insights on the role of quality management systems and the culture of continuous improvement.</p>	
<p>During my internship, I had the opportunity to organize and participate in a critical design review of my PCB design with my supervisors and other avionics engineers. This was an avenue to present my work, receive feedback, and evaluate the design within a wide spectrum of contextual factors impacting the engineering discipline.</p> <p>In the review, I demonstrated the systematic principles of engineering design that guided my PCB design. I gave a detailed explanation of my choice of components, their physical layout, and the design trade-offs considered for Electromagnetic Interference (EMI) and Electrostatic Discharge (ESD) protection. This design review meeting was akin to a product pitch to my supervisors, enabling me to showcase the potential interactions between the PCB system and its end-users from a commercial perspective. I was also required to explain how my design conformed to Australian aerospace standards and regulations.</p> <p>From a human factors perspective, I delved into the ease of installation, maintenance, and user interaction with my device, as well as the safety of the device as a mission-critical system. Further, I took into consideration the roles and capabilities of our technicians and PCB manufacturer who would fabricate, install, and maintain the PCB.</p> <p>The feedback I received from my co-workers was invaluable. They highlighted areas for improvement and enhancement that I hadn't previously considered. This feedback and the collective expertise present in</p>	<p>1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline</p> <p>- Added DEEP framework</p>

<p>the room underlined the significance of collaboration and review in the engineering design process. The successful design review demonstrated my understanding of systematic principles of engineering design, international engineering practice, the principles of human factors, business management fundamentals, and the roles and capabilities of the engineering workforce.</p>	
<p>Following the submission of my PCB design to the manufacturer, I was assigned the task of developing a 3D enclosure for the PCB. The design tool of choice was a cloud-based 3D CAD platform named OnShape. My prior experience with CAD was limited to hobbyist 3D printing, and creating an aerospace-compliant robust enclosure was a more sophisticated endeavour.</p> <p>The challenge was to proficiently apply technical skills in mechanical design and enclosure fabrication, thereby expanding my engineering competencies. My objectives involved gaining a deep understanding of OnShape and learning the principles of mechanical design and material properties for the creation of a functional and durable aerospace-grade enclosure.</p> <p>I embarked on a rigorous learning process, starting from fundamental sketching and extruding tasks in OnShape to eventually mastering advanced features such as counter-bore holes, threading, and creating assemblies. I supplemented this learning with guidance from mechanical engineers and a study of material properties and mechanical design principles. Critical considerations included the mechanical strength of the enclosure, ease of assembly, and a stack configuration implementation.</p> <p>The outcome was a custom-made enclosure precisely suited to my PCB's dimensions and requirements. Learning this software and the fundamentals of 3D modelling enabled me to apply advanced technical knowledge within this specialist domain of the engineering discipline proficiently. This experience has not only deepened my understanding of CAD and mechanical design but has also underscored the essential role of in-depth knowledge in engineering disciplines.</p>	<p>1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline</p> <p>- Added STARL framework</p>
<p>Post the design and fabrication of the enclosures during my internship, I was tasked with assembling them alongside experienced electrical technicians.</p> <p>The challenge was to apply theoretical knowledge and engineering principles in a hands-on assembly process, bridging the gap between design and practical implementation.</p> <p>While working with the technicians, I actively engaged in the assembly of the enclosures. I applied my understanding of engineering fundamentals and physical principles to systematically investigate and interpret the design. A specific issue arose during the assembly process – a gasket between the enclosure stacks was not fitting correctly. Instead of relying solely on the technicians, I took the lead in critically examining the problem. Using my knowledge of material sciences and electromagnetic theory, I proposed a solution to make the gasket groove deeper and wider.</p>	<p>1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.</p>

<p>My proposal was successfully implemented, resolving the assembly issue. This hands-on feedback provided invaluable insights about practical realities of manufacturing and assembly, highlighting the need for robust, assembly-friendly designs.</p> <p>This experience underlined the significance of engaging with the engineering discipline at a phenomenological level. It reinforced the importance of combining theoretical knowledge with practical engineer, iterating design based on hands-on feedback, and using scientific and engineering fundamentals to solve complex problems. It made me a better engineer, capable of creating more practical and robust designs in the future.</p>	<p>- Specific examples of how I met the competency.</p>
<p>During my work experience at Gilmour Space Technologies, I was granted the opportunity to delve deep into the engineering discipline. From developing a software prototype to producing a final hardware product, my journey was filled with a series of learning opportunities, challenges and growth. During the integration testing with my hardware prototype, I was able to ensure effective communication between a microcontroller and a propulsion battery. This was thanks to a comprehensive evaluation of the latest advancements in microcontrollers. The process highlighted the value of interdisciplinary collaboration as I worked closely with propulsion engineers. Designing the PCB for the final product was a challenging task that required mastering Altium Designer, an industry-level software. This process involved careful component selection, layout design and electrical / thermal performance analysis. The critical design review meetings with my supervisors and fellow avionics engineers enhanced the final hardware design and underlined the importance of teamwork and communication in engineering. To create a robust enclosure for the PCB, I explored 3D modelling using OnShape which expanded my engineering competencies. The assembly of the enclosures offered practical insights and highlighted the importance of an iterative approach in engineering design. Conclusively, my experience at Gilmour Space Technologies was a journey of continual learning, proactive engagement, and iterative design in the engineering discipline, equipping me with invaluable skills for my future engineering endeavours.</p>	<p>Conclusion</p>

Word Count 1925

Professional Report #3: Meetings, code-reviews and KPI planning	
Organization	Gilmour Space Technologies
Location	5-Mellennium CCT, Helensvale,
Supervisor	Mr. Alex Forward
Dates	21/11/2022 – 24/2/2023
Title/Role	Avionics Engineer Intern
Category	A

Description	Competency Claimed
During my work experience at Gilmour Space Technologies, I was involved in daily stand-up sessions, weekly sprints, weekly team meetings, code	Introduction

<p>reviews, and planning quarterly Key Performance Indicators (KPIs). The quarterly company meetings allowed me to achieve a business and management perspective within the company, and the regular team meetings gave me insight into the company's approach to collaboration and tools for managing engineering projects. The code reviews and KPI setting that I was involved with taught me about leadership, teamwork, and the importance of multidisciplinary and multicultural perspectives.</p>	
<p>During my internship at Gilmour Space Technologies, I had the opportunity to participate in company-wide quarterly update meetings. Here, each engineering department presented their recent work, thereby providing an interdisciplinary understanding of the company's engineering practices and their approach to sustainable practices.</p> <p>In these meetings, I observed how each department adhered to the standards and codes of practice, as well as legislative and statutory requirements, for their respective projects. One of the most prominent aspects I noticed was the company's focus on safety engineering and risk management, particularly for flight critical technology. I also noted their commitment to the social, environmental, and economic principles of sustainable engineering practice.</p> <p>To actively understand the safety measures and risk management, I took the initiative to ask pointed questions during presentations, specifically on safety protocols and contingency plans in the development and testing of rockets. For instance, I asked about the procedures in place to mitigate the risk of launch failures and safety protocols for handling propellants.</p> <p>In exploring the company's focus on environmentally friendly and economically feasible practices, I requested information about how materials were sourced and recycled and the strategies for minimising waste during manufacturing. I found that the company was dedicated to sourcing materials responsibly and recycling or reusing waste where possible, such as recycling leftover metal materials from the manufacturing process.</p> <p>Moving forward, I aim to continue applying the principles of sustainable engineering practice that I learned at Gilmour Space Technologies. I will carry forward the lessons learned regarding adherence to standards and safety practices, as well as the importance of understanding social, environmental, and economic sustainability. Moreover, I plan to incorporate the project management strategies that I observed in future work.</p>	<p>1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline.</p> <p>- Clearer about my role</p> <p>- Added specific examples</p>
<p>During my internship at Gilmour Space Technologies, I was entrusted with managing my own product as part of our Software and Avionics projects. My responsibilities extended beyond participation in the stand-up meetings, agile sprints, and sprint reviews as I was deeply involved in the active conduct and management of the project.</p> <p>In applying agile methodologies, I operated both individually and collaboratively, swiftly responding to shifts in priorities across the team and strategically aligning my project to complement broader team goals. Each</p>	<p>2.4 Application of systematic approaches to the conduct and management of engineering projects.</p>

<p>day at the stand-up meetings, I articulated my progress, addressed any blockers, and aligned my daily focus with the team. This helped optimize our collective and individual outputs.</p> <p>I applied project management tools, such as Kan Ban boards, for backlog management and task tracking. Additionally, I used burndown charts to monitor the project's progression effectively. These tools played a pivotal role in the successful planning and execution of my project. Moreover, during sprint reviews, I took the initiative to realistically assess the effort put into the project, incorporating feedback to adapt strategies and increase project productivity. I was also conscious of the need to integrate business planning and financial management considerations into our strategies, aligning the project with the company's broader organizational goals.</p> <p>In retrospect, these meetings also allowed me to evaluate the project's performance within the overall implementation context, identifying areas for improvement. This process honed my skills in applying systematic approaches to manage engineering projects and encouraged a commitment to continuous improvement in engineering practices. In my future roles, I plan to leverage these valuable experiences and the skills acquired to manage complex engineering projects more efficiently.</p>	<p>- Clearer about example that demonstrates the competence.</p>
<p>My work experience within a defence company presented my first encounter with strict confidentiality requirements and the protection of sensitive information, starting with the signing of a non-disclosure agreement. The engineering practice, particularly within the defence industry, requires a high level of ethical conduct and professional accountability.</p> <p>The situation required me to uphold the Engineers Australia's Code of Ethics and established norms of professional conduct. This entailed respecting the intellectual property rights of the company, understanding the need for due diligence in certification, compliance, and risk management processes, and being accountable for the safety of others.</p> <p>Despite my excitement for the opportunity, I responsibly adhered to the terms of my non-disclosure agreement. I refrained from sharing any sensitive information or images publicly and maintained discretion even in casual conversations outside of work. I adhered to the company's stringent policies on certification, compliance, and risk management. Furthermore, I ensured the safe handling of equipment and materials, and complied with workplace health and safety protocols. As part of my orientation, I received training from the security team to understand cyber vulnerabilities associated with my work laptop and digital assets.</p> <p>Through this experience, I demonstrated a strong commitment to upholding ethical conduct and professional accountability. I realised that any breach could lead to serious consequences, not only for the company's operations and potentially national security, but also for my own employment. This experience underscored the importance of understanding and upholding the principles of ethical conduct, professional</p>	<p>3.1 Ethical conduct and professional accountability.</p> <p>- Added DEEP framework</p>

<p>accountability, and intellectual property safeguarding in engineering, particularly within defence companies.</p>	
<p>Upon commencing my internship at Gilmour Space Technologies, one of the initial challenges I encountered was understanding the aerospace design process' intricate data and system specifications. An essential part of my role was to access, evaluate, and effectively utilize the company's comprehensive information database and external databases.</p> <p>My primary task was to absorb and apply specific details from a wide range of resources, which included proprietary company reports, industry research, and NASA documentation. This task was crucial in maintaining the high engineering standards upheld by the company.</p> <p>To tackle this, I became proficient in accessing and systematically searching the company's extensive database, and the use of indexes and other search facilities. For external databases, I frequently used Google Scholar and NASA's Technical Reports Server (NTRS) to access research papers and mission documentation including the "NASA System Safety Handbook". In addition to locating and accessing these resources, I critically evaluated their accuracy, reliability and authenticity to ensure that the data used in the company's design processes were relevant and reliable. Simultaneously, I was learning about and implementing common document identification, tracking, and control procedures within the company's system, which included the use of SharePoint for document control.</p> <p>The systematic and thoughtful application of these actions led to an enhancement of my skills in the professional use and management of information. It facilitated an efficient workflow within the company, thereby contributing to maintaining the company's high engineering standards.</p> <p>Through this experience, I gained a deep understanding of the importance of managing and using information effectively, especially in a complex and highly technical field like the aerospace industry. The cruciality of assessing the reliability of data and the benefits of systematic document control procedures were key lessons I took away from this experience.</p>	<p>3.4 Professional use and management of information.</p> <p>- Added specifics about how I accessed information and an example of a document I accessed.</p>
<p>During my internship, one of my core responsibilities was participating in code reviews and setting KPIs. Code reviews were a platform where multiple lines of code were discussed and dissected by team members, allowing me to grasp the nuances of teamwork and the importance of diverse perspectives. Additionally, I was entrusted with setting manageable KPIs that aligned with the department's broader goals, a process which required diligent planning, execution, and monitoring.</p> <p>The experience of observing and participating in the code reviews was enlightening. Not only did it help me appreciate the various technical viewpoints within my team, but it also underscored the importance of collaboration in producing a refined final code. Similarly, the responsibility of setting KPIs gave me a sense of leadership and taught me the importance of making informed decisions.</p>	<p>3.6 Effective team membership and team leadership.</p> <p>- Clarified and specified specific events/interactions.</p>

<p>One memorable instance was during a code review where I was trying to decode CAN packets. Initially, I was using a method that, as pointed out by a senior engineer, was inefficient. Open to suggestions, I discussed my reasoning behind the chosen approach, which led to an enriching conversation about different coding strategies. The senior engineer then introduced me to the concept of enumeration, a far more efficient method. This incident underlined the importance of expert advice and constructive criticism in enhancing both personal performance and the overall team's effectiveness.</p> <p>In terms of KPI's, at the start of my internship, I set a goal to test all types of Remote Data Acquisition Unites (RDAUs). However, as the project progressed, it became apparent that this goal was too ambitious given the time and resources available. After consulting with my supervisor, I revised the KPI to focus on testing just one type of RDAU. This adjustment taught me the importance of setting realistic KPIs, reassessing them considering changing circumstances, and the value of aligning individual goals with broader project objectives.</p> <p>Moving forward, I plan to utilize these experiences to positively influence my future engineering career. I aim to ensure that my decisions are always informed and balanced, considering both the short and long-term effects on my team and the project. Additionally, I will strive to foster an environment where everyone feels comfortable discussing ideas and criticisms, contributing to the team's collective growth and the quality of our work.</p>	
<p>During my work experience at Gilmour Space Technologies, I had the opportunity to immerse myself in various aspects of the company's operations and culture. I became deeply involved in daily stand-up sessions, weekly sprints, team meetings, code reviews and KPI planning. The practical experiences provided me with a deep understanding of the inner workings of the organisation and the roles of various engineering departments. This multidimensional understanding was complemented by valuable insights into leadership, teamwork, and the importance of respecting and fostering multicultural and multidisciplinary perspectives. The company-wide quarterly update meetings were instrumental in providing a broad business and project management perspective. By having the opportunity to hear each department's contribution and how they fit into the broader organization's goals, I was able to appreciate the strategic alignment of our individual engineering projects. I was able to gain insights into the safety measures and risk management strategies at the foundation of the company's commitment to sustainable and responsible engineering. I was deeply influenced by the ethical conduct, confidentiality and intellectual property within the company. My first experience with a non-disclosure agreement really helped me to understand the importance and seriousness of my responsibilities within my role. This experience assisted me in grasping the importance of maintaining high levels of integrity and professionalism within the engineering and defence sector. My experience also enhanced my skills with professional information use and management. Having an extensive</p>	<p>Conclusion</p>

<p>database of information at my disposal taught me to become proficient in locating, analysing, and utilizing data effectively. This gave me a practical lesson in critical analysis and information management. Participating in code reviews and KPI planning allowed me to comprehend the intricacies of team dynamics and offered me the opportunity to grow as a team member and a leader. Through these experiences I was able to learn the value of diverse viewpoints and the importance of taking the initiative and fulfilling leadership roles. My work experience at Gilmour Space Technologies was incredibly enriching as it provided me with a comprehensive understanding of the various facets of working in an engineering organization. This includes teamwork, leadership, ethical conduct and effective information management. The insights and skills that I have gained from these experiences have been instrumental to developing my foundation as a professional engineer.</p>	
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