

1.1 Achievement

COMPLETED

1104

hours

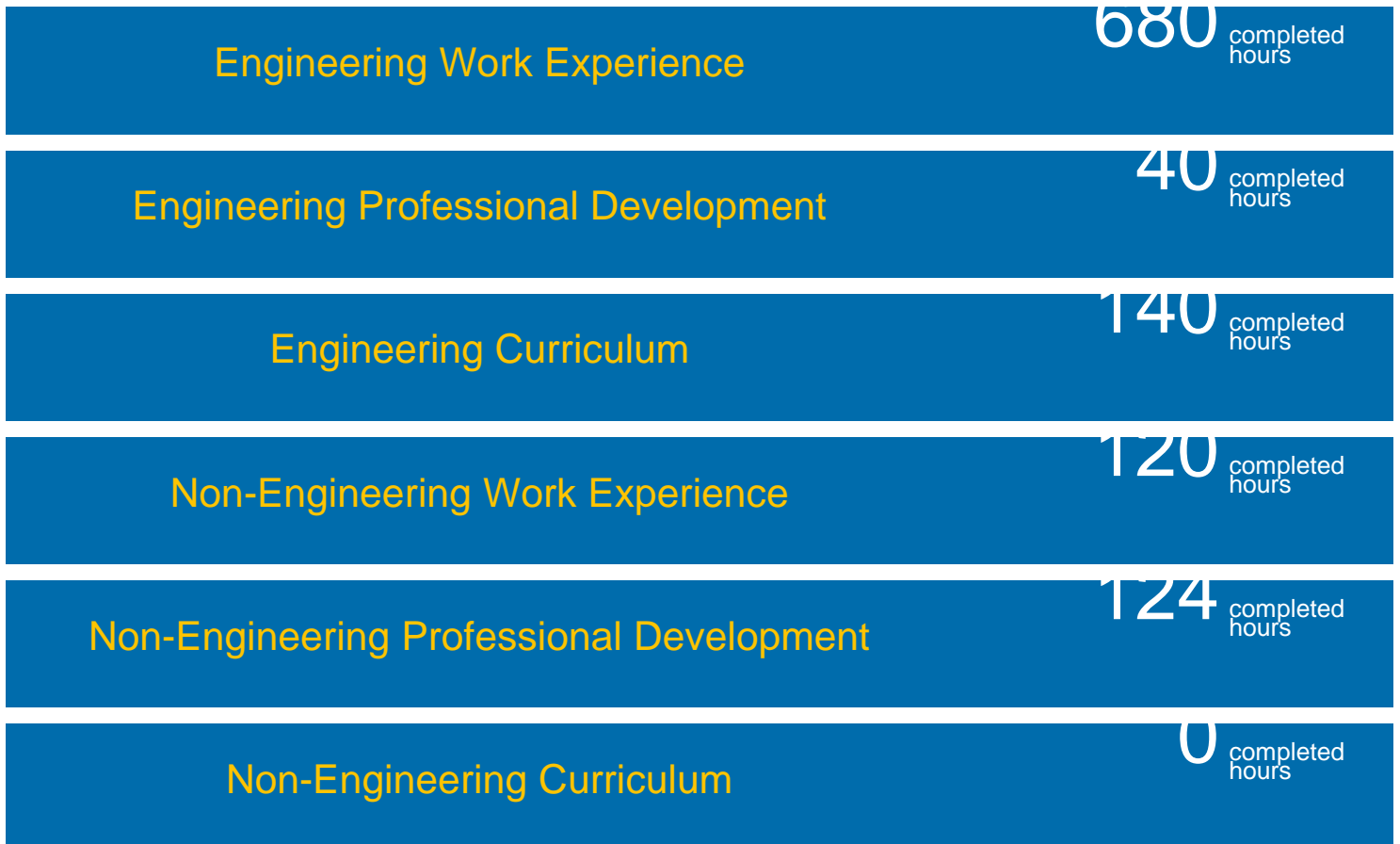
TARGET

420

hours



1.2 Activity Summary



1.3 Reflection Summary

Group Project

Hours claimed: 50 hour(s) as Engineering Curriculum

Our group was tasked with designing a spacecraft mission based on given requirements.

SKILLS UTILISED:

Teamwork

Describe a situation which demonstrates your ability to identify and work with the strengths and limitations of team members (and yourself!).

As part of the spacecraft design class, we split into groups of 4 and tasked with the design of a space mission including all subsystems designs, risk assessments, launch planning etc.

Within the team we all choose and/or voted on who will design and work with which subsystem. I chose the power and optics subsystem. Other subsystems included AOCS, propulsion, communication, thermal and structure.

We had weekly meetings where we would share our progress on our subsystems. Through constant communication, we could always see how everyone was faring with their tasks. Due to our different backgrounds (we each came from a different country), and also due to our different Bachelor degrees, there was always one person who had some experience in an area where another lacked it. In this way, through weekly official meetings but also through general communication throughout the week, we could, as a team, solve any problem that arose. For example, I didn't have much prior knowledge of spacecraft optics, whereas another team member knew a bit more about it. He helped me with my questions, and I also helped him with the risk assessment, which I had done once before in another project.

Through teamwork and constant communication, our team was able successfully design a space mission that fulfilled the requirements. Through sharing knowledge and helping each other, we accomplished something that would not have been accomplished had we focused only individually on each subsystem – at least not in the limited time frame that we had. Therefore, I was able to work with and recognise the advantages in the strengths and limitations of both myself and of my team members in the pursuit of a common goal.

Initiative and Enterprise

Describe a situation when you used initiative and created enthusiasm and support to make things happen.

I was in a team of 4 for a spacecraft design unit. We were required to design an entire spacecraft mission based on a set of requirements. We had roughly 2 months to complete this project. During this time, it was dark most of the day (this exchange was above the arctic circle in Sweden, where during winter there is barely, if any, sunlight). In addition, we all had large workloads but not a lot of motivation due to constant darkness and the body feeling tired as result.

We met once a week to report on our progress and work together on any problems that we might have. These meetings would take around 1 to 2 hours depending on what problem had arisen. As part of the team, I felt that I should try to increase the motivation and energy levels in the team.

I decided to bake a cake and bring it to the meeting to encourage more enthusiasm for the meetings. Everyone in the team loved it and we ended up getting a lot more done in that meeting (after the cake was eaten).

I ended up starting a trend in my team and every week someone else would make a cake or bring treats. The meetings turned out to be great fun and everyone was much more motivated to meet up, myself included. We worked hard in every meeting, and received the highest grade in the class! I learnt that work needs to have a fun aspect as well and that breaks are very needed for any project (especially if carrying them out in the arctic circle). I also learnt that such breaks strengthened the bond between team members because it gave us the opportunity to chat and get to know each other. This really helped the team dynamic and opened up communication significantly.

LIDAR Group Project

Hours claimed: 90 hour(s) as Engineering Curriculum

In this project, a group of 4 of us were tasked with the design, procurement, construction, testing and demonstration of a spacecraft instrument. Our group chose to create a LIDAR instrument.

SKILLS UTILISED:

Communication

Describe the worst communication situation you have encountered and how you were able to overcome it.

I was the project manager for a team project consisting of designing, procuring components for, constructing, testing and demonstrating a LIDAR instrument system within a space instruments class during my exchange at (Uni). My team consisted of 3 other students and myself. As project leader, I called weekly project meetings. Throughout most meetings, nobody else spoke or responded to my questions, or if they did, then reluctantly so. There was awkward and quiet communication, if any.

As project leader I saw my role to consist of coordinating and managing the project, including time management, allocating tasks and most importantly to listen to all ideas and let all team members express their strengths and weaknesses in order to best allocate them to tasks, myself included. The problem was that my fellow team members did not readily express their ideas or their work progress.

I first tried to individually ask people to voice their ideas and opinions in team meetings during initial brainstorming, however this did not work - presumably because they felt "put on the spot". As a result I adapted my strategy and I suggested that everyone write down their ideas on pieces of paper and collect them afterwards. This worked better than the initial approach and we were able to discuss some ideas. However, the team meeting still felt very awkward and unmotivated. I saw that the problem was a lack of motivation, disinterest in the project and probably shyness. My next strategy was to put in a lot of work myself, communicate in a "bubbly" and optimistic fashion, in an attempt to motivate the team by being motivated myself and being a good role model. After a few weeks, the other team members were a bit more open, but still not very forthcoming or interested. To keep the project running as best as possible, I ended up

talking to my team members individually, outside of team meetings, which they were all more comfortable with. I still held meetings to update everybody on the project's progress, however I did most of the talking in these.

By talking to all team members individually outside of meetings, I could keep track of progress. Whilst the others were not aware of each other's working much of the time due to the lack of communication between them (which I could not force nor control, besides recommending more communication), through my constant communication with each team member I served as the middle point for team communication. As a result, the project could move forward. In my opinion the project would have been a lot more productive and successful if more communication had occurred. I believe I made the best of the situation and learnt how to calmly and professionally optimise a situation that was frustrating at times.

(Company) Engineering Challenge

Hours claimed: 40 hour(s) as Engineering Professional Development

As part of a group, designed a space mission based on a set of mission requirements. We presented our progress every day via online live video to (company), each student presenting at one point. This activity had a time limit of one week and at the end of this week the final results were presented. Our class successfully completed the activity on time to fulfil all given requirements.

SKILLS UTILISED:

Use of Tools and Technology

Describe a situation in which you were able to apply technology as a management tool in the workplace.

The (Company) Engineering Challenge required a lot of coordination within a short period of time. One helpful aspect to this project was that the whole class was in one room for the duration of the challenge (one full-time working week). Another helpful aspect was the technology tool of Excel Concord which allowed for rapid sharing of information.

In order to optimise our spacecraft design, we had to iterate it multiple times and every time each sub-group was required to recalculate or redesign in order to accommodate the new data or decision.

We all used the Excel Concord tool to record all our newest design calculations and data in real time. This meant that all class work, relevant to new iterations, could be accessed immediately and no delays would ensue from having to personally collect the data from a group all the time.

As a class we were able to iterate many times. It was a very efficient process due to Excel Concord, as well as of course general communication. Excel Concord aided technical communication. We ended up being the only team of the challenge who designed a mission that could fulfil all given requirements.

Use of Tools and Technology

Describe a situation when your ability to learn and work with current technology contributed to a productive outcome.

During the (Company) Engineering Challenge, our class was required to design a space mission within the time limit of one week.

I was part of the sub-group that was to perform the trajectory analysis. In order to do so, the most effective, available tool was STK (Systems Tool Kit). Within a week, I learned how to use this software to the standard that was required by this project

By using software tutorials and examples, I self-taught how to use the software. Within my sub-group, we also helped each other with this learning, and I could show other team members how to perform certain tasks with STK and they could show me the same, with different tasks.

In this way the whole team learnt how to use STK very quickly and we were able to perform trajectory analysis. Our results were used for other calculations and mission design aspects in other sub-groups.

Intercultural Competence

Describe a situation or project where a positive outcome depended on the work of people from a wide range of backgrounds and ideas.

During my time at exchange, my Spacecraft Design class had the opportunity to participate in the week-long (Company) Engineering Challenge, where 4 teams from 4 universities were tasked with completing a full mission design based off a set of mission requirements. The Master's class (as part of my Monash exchange) was made up of people from all over the globe, who had studied their bachelor's degrees in numerous countries and were part of numerous cultures.

Through concurrent engineering, we worked simultaneously on different aspects and subsystems of the space mission and continuously updated all new information and calculations on a shared database. This allowed us to continuously iterate our overall design at maximum efficiency. This also meant continuously communicating with many different nationalities and backgrounds for a full week. It was important to speak clearly (the Australian accent was difficult to understand for many non-Australians) and precisely (to get information across as efficiently and as possible).

I worked a lot on speaking clearer, slower and more precisely. I learnt this from the other students, for the majority of whom English was not their first language. I could apply this to the 5-minute oral presentation I presented to summarise the work of my sub-team, for which my audience included my class, (Company) and other universities (one from England and one from Spain). Through speaking with everyone in the class at some point, I saw that each person had different strengths and different ways of approaching a problem. As a class we were able to harness everyone's different strengths and had sessions wherein everyone could voice their opinion. If someone had a problem that they couldn't solve, he/she would ask the whole class, and everyone would brainstorm together to find a solution as fast as possible. Since everyone's work relied on all other work done in the class, this was imperative to designing a mission. This is the reason for concurrent engineering practices.

Our class was the only out of the 4 competing classes to develop a mission design that fulfilled all given requirements. Due to our openness to others, strong and clear communication skills between all members, and maximising each person's individual skillset, we successfully worked as a team to design a space mission within a week.

(Company) Internship

Hours claimed: 280 hour(s) as Engineering Work Experience

(Company) is a German manufacturer of passenger seats for commercial aircraft. During my internship there, I worked on technical engineering topics within the certification area, using their CDB database to organise flammability test certificates and writing flammability test reports. I gained experience in professional report writing skills, German and English communication skills.

SKILLS UTILISED:

Creativity and Innovation

Describe a project or situation where you felt the conventional approach was not suitable or ideal - where you had to challenge perceptions of how things are - and convey new ideas to stakeholders.

I was tasked with organising the roughly 1000 official test certificates of the company. Prior, they were to be found in many different folders, unlabelled, and not easily found, which resulted in tests being repeated or a lot of time being wasted to find them.

It was my task to find all test certificates and create a system to organise them for easy access. I was expected to use the existing internal database and its labelling system to file the certificates. I asked other colleagues how they intuitively would search for the certificates normally, as I wanted to create a system best suited to employee's needs. Overall, things like the date, the type of test, whether the test item consisted of single parts or assemblies, the test code, materials, and manufacturer of the parts were important search filters for the certificates.

I saw that the current labelling system of the internal database did not support enough filters to organise the test certificates in a way that would make one specific certificate easy and fast to find. I suggested to my boss that, with the help of the IT department, we could customise the database search window to accommodate this. My boss was happy with this idea, as it also had not been thought of before. My boss approved my idea. Together with the IT department I altered the search window to include more filters and labels, and I wrote a corresponding set of nomenclature instructions for anyone who were to file certificates in the system in future.

On several occasions I was approached and asked for a specific test certificate. I was able to find it almost immediately using my new system, and showed others how to use it. I was told that I had saved my colleagues hours of searching time.

(Company) Internship

Hours claimed: 400 hour(s) as Engineering Work Experience

I completed a 3-month long paid internship at (Company), a medium-sized company in Germany, that performs system engineering in the space industry such as the design, analysis, integrations and testing of instruments and subsystems of satellites. Among others, my tasks included the design and construction of a test rig for a magnetic moment test, incoming inspections of flight hardware, and supporting the quality assurance of a calibration system of a satellite spectrometer by developing a verification matrix. Through these tasks, I further developed my Solidworks skills, professional writing skills for official reports and documentation, and German language skills. I gained experience in working in both ISO 8 standard and ISO 5 standard clean rooms, in performing ultrasound cleaning of parts, in manual drilling, and in integration of a satellite instrument.

SKILLS UTILISED:

Professionalism

Describe a time when you needed to take responsibility for your own actions.

Some flight model hardware parts were delivered back to the company.

It was my responsibility along with another colleague to perform the incoming inspection for these parts. This included closely examining each part, taking close-up images of any faults, filling out and signing inspections reports, filing these reports, and reporting all things amiss to the payload manager.

We performed all incoming inspections and photo taking together. I offered to finish the other tasks (filling out and signing inspections reports, filing these reports, and reporting all things amiss to the payload manager) and my colleague agreed. We both signed the reports, but I was the one who filled them out and reported the faults to the payloads manager, therefore carrying a lot of responsibility for the incoming inspection. Additionally, it was a lot of responsibility to handle the flight model parts during inspection, as they are very expensive and unique.

Due to acting professionally, that is, working with integrity, reporting everything, and handling all items with extreme care, the incoming inspections were successfully performed.

Problem Identification and Solution

Describe a situation in which you faced a significant obstacle to succeeding with an important work project or activity.

A test procedure that I had written had been checked and approved by several colleagues and was ready for official release. The day before official release, I found a major error in the base assumptions that had been given to me. I was the first to recognise this mistake. The current test procedure would not have upheld industry standards and any testing would have been unusable as a result. The problem that presented itself was one that could waste a lot of time and money. To correct the error in the test procedure would mean to change the entire test procedure. The implications were that new hardware had to be used for the test setup and the written procedure had to be changed within a week.

I identified the problem and asked for a second opinion from an experienced colleague, who confirmed the mistake. I decided to first find a solution before presenting the problem to my boss. I tasked myself with finding a solution as quickly as possible and then presenting the problem and solution to my boss to get approval to change the test procedure.

Finding a solution included performing new measurements for the test setup and using Solidworks CAD to update and create a new 3D model to confirm all dimensions and provide professional images for the procedure document. Once I was certain that the problem was solved and the correct base assumption and test requirements would be verified with the new test setup, I approached my supervisor and told her of the problem and of the solution. She was happy that I had found the mistake and happier that I already had the solution. With her approval I finalised all paperwork for the new test procedure within a week.

The test could go ahead as planned with minimal delay and full compliance with official aerospace test standards. I learnt to always criticise and double-check my basic assumptions, whether I make them or someone else does.

Problem Identification and Solution

Describe a time when you came up with a new approach to a problem.

To organise all requirements of a project, they were recorded in a verification matrix. However, there were just under 1000 requirements. It was easy to miss some during testing only find out later about the requirement and that it could have been fulfilled had the testing incorporated one or two more steps.

I was tasked with making a packaging test procedure and updating the verification matrix. While updating the matrix and looking through test reports, I noticed that some requirements were missed.

I approached my boss and told him of these missed requirements. I suggested making a complementary matrix to categorise all requirements in their applicable testing area. He was happy about the idea and approved it.

My new matrix was incorporated into test planning and helped identify which requirements still had to be fulfilled.

Initiative and Enterprise

Describe a situation when you showed initiative and took the lead.

I had finished early with my other tasks and knew my boss had meetings all day. With some time on my hands, I decided to find out what the company still needed done for another project I had helped out a bit in. The project testing phase had begun and I was aware that work was still to be done before testing could commence.

I searched through the project folder and project timeline. I saw that a test procedure for a magnetic moment test had not yet been written, and that the test was to be performed in the coming months. For a test to be performed, the corresponding test procedure first had to be officially released.

I started work on the test procedure, referring to similar past procedures, ECSS standards, and advice from other colleagues who had experience in integration and testing. As I had taken the lead to begin the test procedure, I ended up taking the lead for the magnetic moment test in general. I wrote the test procedure entirely, organised and ran the Test Readiness Review meeting, was given the authority to procure necessary parts as well as to have parts (that I designed) manufactured internally, and worked a total of 2 months on this test preparation.

As I had started on the test procedure ahead of time, I saved time for the project in general. In acting with initiative and not waiting for work to be handed to me, I ended up securing for myself 2 months worth of work, during which time I was given the main responsibility for the magnetic moment test.

Professionalism

Describe a time when you had to make decisions about when and how to align behaviours with organisational culture and protocol.

There was a situation in which another colleague had given me a project to do. However, my colleague had misunderstood a key requirement that set the base assumption for the project and had given me wrong instructions as a result. I worked for 2 months on this project using the base assumptions that he had given me. On the day before an official release of my work and official documentation was to occur, I noticed the mistake. The implications of this was that my 2 months of work did not fulfil a key requirement and was therefore unusable.

I had several options. I could have shared the problem with my boss immediately and asked for advice about what to do. This would have been the easy option. I could have confronted my colleague who had misunderstood the requirement and demanded that he fix it. I could have told my boss about my colleague's mistake. I believe I chose the most professional way to deal with the situation and instead set about solving the problem myself.

I first had to know if I had understood the base assumption correctly and that there indeed is a mistake. I asked another colleague who had experience in similar work, who confirmed that there was a mistake. After confirming the problem, I took new measurements of key equipment and ultimately determined that the problem could be fixed within a week, considering that all documentation had to be updated and changed almost totally. Once being certain that I could fix the problem myself and how to go about this, I approached my boss (before the official release deadline of the documentation). I conveyed the problem and solution all at once. My boss was relieved that a solution to the problem had already been found. I did not name the colleague who had give me the wrong information. My boss gave me the go-ahead to change the documentation and update the project.

I made these decisions because I could recognise that the project was the priority and that blaming someone would be unproductive. I chose the most productive and professional route.

The official release of the project documentation ensued a week later, and all requirements were correctly fulfilled. I learnt that one should always try to find a solution to a problem before making the problem your boss' problem. I also learnt that people make mistakes and that I should not take base assumptions for true without double checking them myself and looking at official spacecraft engineering standards.

Creativity and Innovation

Describe a time when you were able to develop or design a novel product, processes or strategies.

Instead of outsourcing a magnetic moment test, it was preferable to do one internally in the company. A test setup had to therefore be created to satisfy ECSS standards and test requirements.

I was tasked with the design and construction of a magnetic moment test rig. It was required that the magnetometer could be turned in all three axes whilst having the centre of the magnetometer remain in the exact centre of the rotation. The company wanted to be able to reuse such a rotation platform for different magnetometers with different dimensions, thus it had to have a generalised design that could be adapted to fit multiple different magnetometers.

My first steps included finding ready-to-buy rotation mechanisms with high accuracy rotation. The challenge lay in then ensuring that the sensor centre did not move, which was depended on its dimensions. Using Solidworks, I designed and created adaptors to fit the magnetometer to the rotation platform. I played around with different designs to see which ones were optimal (the least cost, easiest to use, least amount of material costs). I then made engineering drawings of them.

These adapters were approved and then manufactured internally and were successfully applied in the magnetometer test.

(Company) Representative

Hours claimed: 84 hour(s) as Non-Engineering Professional Development

Organised and led outdoor rock-climbing trips as well as weekly indoor rock-climbing.

Assisted with the supervision, organisation and running of other activities on (company) club trips, during which a high level of responsibility was required, further strengthening my self-initiate and managing skills. I was part of (club) as a climbing representative for 1 full year.

SKILLS UTILISED:

Communication

Describe a time when your communication skills made a difference to a situation and/or contributed to a productive or harmonious outcome.

I, along with the other rock-climbing representative of (club), organised and ran a 3-day outdoor rock-climbing trip. The trip was for beginners as well as for more experienced climbers. It was a multi-cultural group of participants, with some not as fluent in English.

Since there were beginner climbers on the trip, a safety instruction was required before any climbing could commence.

As one of the rock-climbing representatives, I offered to perform the safety demonstration at the crag. I knew that it was imperative that I communicate clearly the safety instructions to all participants, as rock-climbing was not without risk and I carried responsibility within the (company) club to ensure safety on all trips.

I made sure to have eye-contact with as many listeners as possible and spoke as clearly as possible so that all could understand me. I demonstrated physically everything I was talking about (how to tie in with the rope, how to check the other person, how to belay etc.) and made sure that everyone could see what I was doing. I also tried to make it a bit of fun and got a volunteer to help with the demonstration so that it wasn't boring and so that I didn't lose the listeners' attention. I asked if there were any questions at the end and made an effort to chat with everyone on the trip throughout the trip so that they knew that I was approachable and that they could talk to me if any issues or questions should arise.

I got a couple of questions and could clear them up without a problem. No incidents occurred on the trip and everything ran smoothly and safely.

Planning and Organisation

Describe a situation that demonstrates your ability to organise and develop a system to facilitate your work.

(Club) ran regular outdoor and indoor climbing trips for its members, for which my fellow rock-climbing representative and I were responsible. There was a large interest in the trips, and good organisation and planning were necessary for a successful trip.

To run a trip, there are many factors to consider, such as dietary requirements, contact details, the nearest hospital, equipment organisation and inventory, accommodation, payment handling etc. I was mainly tasked with the equipment, official risk assessment and payment/ registrations for the trip, although we both worked together as a team to complete all tasks.

Numerous tasks to do with planning and organisation ensued:

- Making a google form and corresponding spreadsheet to record all registrations and details and participants.
- Filling out a risk assessment form
- Sorting through all the climbing gear, making an inventory which took a day, removing any equipment that was nearing its expiration date, recording all equipment. Then sorting out which equipment to bring on the trip
- Organising carpooling between participants, as well as meeting place etc.
- Speaking to camping accommodation staff and making a large booking
- Making a trip itinerary

I knew that this was to be one of the last trips that I would run, as I was to go on exchange the following year. Therefore, I also wrote a set of instructions detailing how to fill out all official club documentation specific to climbing, so that my successor can easily learn how to run a club trip. Such a set of instructions hadn't existed before my role in the club. I therefore developed a system to facilitate both my work and that of my successor.

Due to all of the above tasks, the trip ran smoothly. The club now also had an updated inventory for future trips of all climbing equipment. My successor also thanked me later for the set of instructions I had written, as it had saved her a lot of time with trip organisation.

(Name) Club committee member

Hours claimed: 40 hour(s) as Non-Engineering Professional Development

I was a committee member of the student club (removed). I helped organise social events for students and worked as a volunteer bartender for a three-day student orientation event, working ten hours each day.

SKILLS UTILISED:

Intercultural Competence

Describe a situation in which you demonstrated a commitment to social and cultural inclusion and diversity.

(Club)'s main commitment was to build and facilitate social inclusion and involvement of students at the Kiruna campus (which had less than 100 students in total and therefore was very small). Roughly half the students were international students (myself included).

We wanted to organise an event that included many cultures. Of course Eurovision was a perfect context for this, especially as it was relatively early in the year and therefore not everybody at uni knew each other yet.

As committee member, I was to organise the Facebook event for the Eurovision talent show. The (removed) club itself organised an act for the talent show. I also helped set up the venue and spread the word at uni that

everyone is welcome and encouraged to come to the talent show for some good fun.

We had many people attend the Eurovision talent show, and many students represented their own cultures by singing/ dancing/ etc. to music of their mother tongue or home country. Overall, everyone's unique background was celebrated and encouraged through this social event.

Private Mathematics Tutor

Hours claimed: 50 hour(s) as Non-Engineering Work Experience

Worked as a private Year 9, Year 10 and Year 11 mathematics tutor, preparing worksheets and revision material, as well as assisting with any points of difficulty that the student experienced.

SKILLS UTILISED:

Communication

Describe a time you were expected to read and synthesize complex information in a way that was easily understood by others.

I was a mathematics tutor for year 9, 10 and 11 maths. One of my students struggled to understand many mathematical concepts.

My student was falling behind in class which is part of the reason I was tutoring her, so that she could get extra practice before the tests and exams. We would go through problems she didn't understand and I would explain as clearly as I could until she understood the mathematics behind the problems.

In order to be able to teach the required mathematics, I had to understand it myself first and therefore spent some time to look through various school maths books to see in which ways the books explained the problems. I made summaries for my student using every day language so that it was as simplified as possible for easy understanding. While tutoring her, I made sure to explain the same thing in several different ways until she understood it and could perform the maths herself.

Although high school mathematics was not complex to myself at the time (as I was undergoing university level mathematics), the maths was complex to my student. She did not understand all the explanations in the textbook but after I simplified it and explained it in several different ways, she could understand the maths much better. Once she understood the maths properly, she was able to solve problems much faster. After several months of tutoring she told me that she now felt more confident

CPD Section 1: *Ethics and Professional Accountability*

Drawing upon your CPD experiences, provide examples for two of the following situations.

Part 1:

1. A situation where you had to consider your actions in terms of **ethical conduct**, specifically relating to the Engineers Australia Code of Ethics (Page 4). **(250 words)** You must [download the code here and read it.](#)

Which one of the four behaviours from the Code of Ethics are you describing?

2. Practise competently

Which sub-point are you describing? Please cut and paste the full text from the sub-point.

2.1 Maintain and develop knowledge and skills:

- a) continue to develop relevant knowledge and expertise
- b) act in a careful and diligent manner
- c) seek peer review
- d) support the ongoing development of others

Describe a situation where you considered your actions in these terms?

At my (Company) internship, I was required to create engineering drawings of parts that I had designed on Solidworks. These parts would then be manufactured internally and become part of a magnetic moment test setup that I was mainly responsible for. As I had not made any engineering drawings since my first two years at university, I knew that I had to brush up on my skills. Furthermore, the technical drawing standards in Germany were slightly different to those in Australia (such as general layout and labelling differences or preferences). As outlined in the Practise Competence behaviour of the Code of Ethics, one must "continue to develop relevant knowledge". Through online resources, I self-taught how to make a professional engineering drawing. One must also "act in a careful and diligent manner", which I did by closely paying attention to what dimensions needed to be labelled to avoid redundant labelling. Once the drawings were complete, I asked several colleagues to double check them to ensure their adequacy, thereby following the Code of Ethics, which states to "seek peer support". In fact, from my peers and their feedback I learnt more than from any online resource. Lastly, one "must support the ongoing development of other", which I did later, when another fellow intern asked me on advice on technical engineering drawings. Having learnt from my colleagues, who were experts in their fields and in the mechanical workshop, I could deliver advice to this intern.

Word Count: 242

Minimum Words = 150

Maximum Words = 250

Assessors Comments:

Part 2

(choose only 1 of the following situations):

- A. A situation where you had to consider whether **due diligence** had been applied in relation to risk management compliance.
- B. A situation where you had to consider the **safety of other people**.
- C. A situation where you had to consider **environmental protection concerns**.
- D. A situation where you had to recognise and address **intellectual property** requirements.

(250 words)

Scenario B: Safety

During my time as Rock-Climbing Representative for the (Club), I was responsible, along with the other Rock-Climbing Representative, for an outdoor rock-climbing trip. As rock-climbing is considered an "extreme sport" by many, we had to especially consider the safety of all participants on the trip. There were also beginners on the trip, which means that extra precautions had to be taken by us as supervisors. Another risk factor consisted of the fact that the nearest hospital was a long way away, as we were in the middle of a national park. As an experienced climber, I performed the safety demonstration before any climbing commenced. Throughout this demonstration, I spoke as clearly as possible to get the vital safety

information across to all participants. When everyone started climbing, we continuously checked everyone's rope knots and whether they were all safely tied in. We also made sure that everyone had had a go at tying themselves in, before the actual climbing commenced. Overall, it was a successful outdoor climbing trip without any incidents.

Word Count: 176

Minimum Words = 175

Maximum Words = 250

Assessors Comments:

CPD Section 2: *Effective Communication*

Drawing upon your CPD experiences to answer the questions in each Part below.

Part 1

Reflect on a time when you gave an **oral presentation**. Describe the audience and how you tailored your oral and visual communication to suit the audience. *How effective was this method and what would you change in the future? (250 words)*

What was the oral presentation?:

I gave an oral presentation in my (subject) class whilst on exchange to (university) in (year). I presented the optical instruments and power subsystem of a spacecraft that my team presented in concept. I presented for ten minutes.

Who was the audience?:

The audience consisted of the rest of the (subject) class and our lecturer, who was marking the oral presentation.

How did you tailor your oral and visual presentation?:

I tailored my part of the oral presentation to be as precise as possible, and to show only the most vital information. I spent some time beforehand learning what I would say by heart and knowing my topic extremely well. I placed a limited amount of information on the slides. This way, my audience would not be distracted by too much information on my slides, but rather could concentrate on listening to what I conveyed instead. I also included a lot of visual information in the form of flowcharts, tables, graphs and images.

How effective was your method?:

I received a distinction for my part of the oral presentation. I was asked a couple of questions at the end of my presentation by my lecturer and I was able to answer all of them. Due to my oral presentation practice beforehand, I delivered the presentation with a lot of confidence, and felt very satisfied with my efforts.

What would you change in future:

Instead of learning everything off by heart, I would in future try to only learn my main points off by heart and deliver the rest in a more natural fashion, rather than in prepared sentences.

Word Count: 246

Minimum Words = 175

Maximum Words = 250

Assessors Comments:

Part 2

Describe and **contrast two different formal engineering written reports** that you have produced, in terms of their objectives, target audiences, writing style and structure. *How was each of these reports was appropriate for the intended purpose? (250 words)*

Report 1: Concept Design Report

Objective: To present and review the Phase C mission design of a spacecraft mission fulfilling a set of given mission requirements.

Target Audience: Students and professional space engineers

Writing Style and Structure: Formal writing style using IEEE referencing, formal report structure including chapters: Abstract, Introduction, Mission Statement Document, State of the Art, Technical Requirements and Requirement Justification, Mission Description Document, Preliminary Design Definition File, Project Management, References and Appendix.

How was it appropriate for purpose?: The structure was mapped off official reports in the space industry. This report was appropriate for the intended purpose of describing technical details of spacecraft subsystems, modes, technical budgets and requirements in an organised fashion, because it did so logically and precisely through clearly labelled sections, subsections and subsubsections. It was created on LaTeX/OVERLEAF, a program that creates collaborative authoring tools for scientists and STEM-related endeavours.

Report 2: Electronics in Space Laboratory Report

Objective: To present the results of a laboratory experiment that explores and compares AC and DC gain of the different circuits built around a 741 Op Amp with theoretical hypotheses.

Target Audience: Electrical engineers and fellow Master-level student engineers

Writing Style and Structure: Formal writing style was used, and structure corresponded to standard laboratory report structure, including the chapters: Abstract, Introduction, Experimental Procedure, Results, Discussion, Conclusion, and References (IEEE referencing style).

How was it appropriate for purpose?: It was appropriate for purpose as it successfully fulfilled its objectives and presented all results of the experiment via photos, diagrams, tables and discussion of results.

Word Count: 226

Minimum Words = 175

Maximum Words = 250

Assessors Comments:

CPD Section 3: *Self-Management and Professional Conduct*

Drawing upon your CPD experiences, provide an example of **one** of the following:

Part 1

(choose only 1 of the following situations):

- A. A time where you had to **critically assess your professional performance** as an engineer (e.g. ability to analyse, judge and make decisions). What criteria did you use to self-review your engineering performance? How did this help to improve yourself as an engineer?
- B. A situation where you needed to **apply time management and prioritisation skills** to a project. What steps or decisions were needed to achieve the project requirements? To what extent did your project goals conflict with your personal goals/expectations? **(250 words)**

Option B: Applied time management and prioritisation

During my exchange to (University), I was the project manager for a group of four. We were tasked with designing, constructing, testing and demonstrating a LIDAR altimetry system within five months. This was part of the (subject) unit. Prioritisation was key to completing this project, as it was time sensitive and a lot of work. Time sensitive aspects included the procurement of parts, as delivery time lasted several weeks, as well as seasonal influences - the winter in (Location) reached temperatures well below -20°C, below which the batteries could not operate (we had to test our system outside due to range requirements). As project manager, I took these time limitations into account and created a Gantt chart early on to plan all tasks for the team. Through weekly team meetings, progress was recorded, and our time management plan adjusted if required. For example, we had difficulties with the resolution of the LIDAR data. Applying prioritisation skills, we simplified our design so that we could still finish the project in time. Unfortunately, due to such difficulties and unexpected problems, the high standard of our LIDAR system that we had set in the beginning could not be achieved within the time frame. Our shared project goals and my personal expectations as project manager were compromised due to unforeseen problems and uncontrollable time restrictions. However, thanks to prioritising tasks that ensured the main project goal of constructing a working LIDAR system, we could successfully demonstrate our system.

Word Count: 249

Minimum Words = 175

Maximum Words = 250

Assessors Comments:

Part 2

Give **two examples of professional engineering societies** and reflect on the impact the professional bodies have on the engineering profession and the general society. Have they helped you to improve yourself as an engineer, and if so how? How might they help you in the future? **(250 words) NOTE: These must be professional societies, such as EA, IMechE, Professionals Australia, SAE-A, AIAA, Engineers Without Borders etc. and not student societies or university clubs, such as MESS, MAMEC, Robogals etc.**

Professional Society 1: (removed)

(Removed) is run by student volunteers and young professionals to promote involvement in the aerospace industry. They run the major (Name removed) conference each year, a 4-day STEM networking event where undergraduate and postgraduate students can learn about the different areas of the aerospace industry in Australia and attend workshops. I attended the (Event) in Sydney. This made me aware of what the Australian aerospace industry has to offer, especially as I previously thought that most aerospace jobs would be outside of Australia. I now consider jobs in Australia, and not just overseas.

Professional Society 2: (removed)

(Removed) supports international cooperation and networking of space experts, engineers, CEOs and other decision-makers in the space industry. Each year they run the (Event) with more than 6000 attendees. I attended the (Event) in Adelaide, which included networking for a week, space forums, technical workshops, lectures and talks by industry representatives such as the CEOs of NASA, ESA, and Elon Musk. Due to the international nature of this event, I benefited from obtaining an overview of the current

opportunities and technologies worldwide. It has greatly inspired me to this day and confirmed my passion for space engineering. I plan on attending future (Event) as they are invaluable in networking on a global scale. Being on their email list, I get updated on the latest space news. I believe they contribute greatly to information sharing within the space engineering profession and general society and taught me a lot about industry trends.

Word Count: 250

Minimum Words = 175

Maximum Words = 250

Assessors Comments:

CPD Section 4: *Innovation and Creativity*

Drawing upon your CPD experiences, provide an example of **one** of the following:

Part 1

(choose only 1 of the following situations):

- A. A time when you used **creative or innovative approaches** in either a technical or non-technical context;
- B. A time when you **assessed or systematically evaluated** a new development within the field of engineering;
- C. A time when you **engaged with professionals** from outside your field of study to increase your awareness of broader issues relating to STEM and/or the business environment. **(400 words)**

Scenario A: Creativity or Innovation

During my internship at (Company), I was responsible for creating a magnetic moment test setup. It was to save the company a lot of time and money to perform the test internally rather than outsourcing it to another company. It was very important that the test setup satisfy ECSS standards as well as other test requirements provided to me by my company supervisors.

I set about designing and constructing the test rig. This involved brainstorming, visualising and sketching ideas on paper. A main requirement was that the magnetometer - the sensor in the test - could be turned in all three axes whilst having the centre of the magnetometer remain in the exact centre of the rotation. (Company) also wanted to be able to reuse such a rotation platform for different magnetometers with different dimensions, thus it had to have a generalised design that could be adapted to fit multiple different magnetometers. The overall challenge lay in ensuring that the sensor centre did not move, which was depended on its dimensions. After my initial brainstorming, I used Solidworks to design and create adaptors to secure the magnetometer to the rotation platform. I began laying out possible designs with different dimensions and made sure that they fulfilled all requirements. Then I performed a trade-off, considering which design required the least complex adaptors and the least amount of materials whilst still providing adequate stability. It was also important to weigh up the costs of parts that could be readily bought as well as the parts that had to be manufactured internally. The former, ready-to-buy parts consisted of rotation mechanisms with high accuracy rotation.

Lastly, I made technical engineering drawings of the final designs of the adaptors (there were a total of five adaptors that allowed for two different sensors to be secured to the rotation platform). These adaptors and corresponding drawings were approved by my supervisor and the mechanical department. The adaptors were then manufactured internally and later successfully applied in the magnetometer test.

Word Count: 333

Minimum Words = 300

Maximum Words = 400

Assessors Comments:

Part 2

Reflect on how and why the example you have selected is evidence of your **creative, innovative and pro-active demeanour**. **(100 words)**

Creativity and innovation were at the core of a successful completion of this task, which required the design of something that had not been designed before at the company. The later analysis and optimisation of different design ideas also required my creativity and innovation skills, as well as my critical thinking and problem-solving skills. Throughout the technical drawing phase, I was also proactive because I sought out the help of colleagues in the mechanical department whilst creating the technical engineering drawings, to learn the different labelling and layout standards in Germany for technical drawings.

Word Count: 94

Minimum Words = 75

Maximum Words = 100

Assessors Comments:

CPD Section 5: *Management of Information*

Drawing upon your CPD experiences, provide an example of **one** of the following:

Part 1

(choose only 1 of the following situations):

- A. A time when you **located the information you required via a systematic search of multiple sources** (both online and physical).
- B. A time when you **critically assessed the accuracy, reliability or authenticity of an information source and found it inadequate**.
- C. A time when you **utilised document identification, tracking, naming conventions and/or version control procedures**. (400 words)

Scenario C: Document ID and management

As part of my internship at (Company), I worked within the certification area, using the CDB database of the company to organise flammability test certificates. This included locating all test certificates (there were around 1000 of them) and creating a documentation system to organise them for easy access.

Firstly, I set about locating all certificates and recording and tracking them in an Excel spreadsheet that I had set up. Using my documentation system, I recorded all relevant data about the certificates, including name, date, testing facility, version, test item, material, manufacturer and the test code. I thereby demonstrated document identification, tracking and an early form of version control. Version identification was important because there were often either more than one version of a test, or the same test had been repeated because a colleague was unable to find the existing test certificate as there was no test certificate documentation system in place beforehand. The value of my work lay in creating a well-documented database that allowed for employees to easily locate test certificates, thereby avoiding future waste of time and money spent in searching and repeating already-completed tests.

Once I had documented all documents that I could find, I was tasked with using the existing internal database and its labelling system to file the flammability test certificates. I asked other colleagues how they would intuitively search for the certificates normally, as I wanted to create a system best suited to employees' needs. Overall, things like the date, the type of test, whether the test item consisted of single parts or assemblies, the test code, materials, and manufacturer of the parts were important search filters for the certificates. Together with the IT department I altered the search window to include more filters and labels, and I wrote a corresponding set of nomenclature instructions for anyone who will file certificates into the system in future. I thereby created new naming conventions for the test certificates. My nomenclature instructions became an official document and will facilitate the implementation of my naming and filing system to include other types of test certificates, e.g. shock and thermal test certificates, in future.

Word Count: 358

Minimum Words = 300

Maximum Words = 400

Assessors Comments:

Part 2

Reflect on how and why the example you have selected is evidence of your **professional use and management of information**. (100 words)

This exemplifies my professional use and management of information through my systematic documentation of information (of the certificates) via Excel, as well as through writing an official document providing instructions for using the filing system that I had created. I managed the information in a professional manner by ensuring that I did not overlook any certificates by recording everything in a thorough fashion. I believe I displayed further professionalism by doing what is most beneficial for the company – I attempted to tailor the naming conventions to the company by asking several employees' about how they would search for test certificates.

Word Count: 100

Minimum Words = 75

Maximum Words = 100

Assessors Comments:

CPD Section 6: *Being an effective part of a Team*

Drawing upon your CPD experiences, provide an example of **one** of the following:

Part 1

Describe a time when you were part of a project where there was conflict within the team and reflect on:

- Your role within the project team.
- How did you accommodate varying personality types and gain the trust of your peers & team members?
- What did the team do to resolve the situation?
- What you would do differently in the future and why?

(500 words)

What was **the team**, and what was **your role** within it?:

I was the project manager for a team of four during my exchange unit, (Subject) Project. Our project consisted of designing, procuring components for, constructing, testing and demonstrating a LIDAR instrument system. As project manager, I was responsible for time management, progress reports and the procurement of parts, called weekly meetings, completed the risk assessments, was the spokesperson to our supervisor, and organised and performed the testing of our system.

What was **the conflict** within the team?:

There were two types of conflict:

- During initial brainstorming about what sort of spacecraft instrument to develop, each team member had a different idea and was unwilling to accept each other's ideas. Conflict ensued, as ideas, including my own, were refused very quickly and there was a lot of tension and passive hostility toward one another.
- A longer lasting, passive conflict was that of an unwillingness or inability to communicate with each other. I strongly encouraged communication in team meetings and outside of them, but due to shy personality types or disinterested attitudes, miscommunication or lack of awareness of what the others were doing delayed work overall. Frequent disagreement and frustration ensued as a result.

How did you **accommodate varying personality types** and gain the trust of your peers and team members?:

I did not micromanage my team members, instead listened to their opinions and ideas openly to gain their trust. However, this was challenging because of a lack of willingness to communicate. At team meetings I accommodated for the shy personality types by trying to engage them as much as possible in the discussion. For the disinterested attitudes, I tried to be motivated myself and put in a lot of work and so lead by example.

What did the team do to **resolve the situation**?:

To solve the brainstorming conflict, I suggested everyone make a list of pros and cons for each idea and assess the feasibility, then present this in the next team meeting. In the next meeting, communication flowed better as everyone had something to say, and I made a point of allowing everyone their time to speak without interruptions and objections.

The communication problem was not solved as a team. However, as team leader I talked to my team members individually, outside of team meetings, which they were all more comfortable with. I still held meetings to update everybody on the project's progress, however I did most of the talking in these. I served as the middle point for team communication, could keep track of progress, and share this progress in the meetings.

What you would **do differently in the future** and **why**?:

I learnt that not every team member is motivated or able to communicate. Several members also missed meetings and did not do the work, which was frustrating. In future, I would confront everyone more directly about these issues and try to solve them that way, instead of becoming the medium for team communication myself and accepting the problem. This is important for them as well so that they may learn from the situation and work on their communication skills.

