Research Methods and Professional Practice (RMPP) was a module that lasted for 12 weeks. Within this module I learned various things.

I for example learned about ethics one should follow as an IT expert / Cyber Security expert as well as ethics that must be considered while doing a master thesis. Several interesting case studies from real life examples were provided to use, where we could have fruitful discussions on the importance of ethics for cyber security professionals. Some of the cases clearly showed that due to the rapid development of technology which especially happen in the IT sector and due to the lack of laws ethics is key to have as an integral part of your thinking and motivation as an IT expert. Ethics doing a master thesis is also very important, since personal data you obtain shall also not be leaked. You also may not publish or analyze anything that is outside of the consent the individuals have given you. Not following ethics guidelines in the master thesis besides having obvious severe penalties from the university would also shed a negative light on once personal reputation.

Another key method I learned, which will effectively prepare me for my master thesis, was how to efficiently scan and read a lot of literature during a literature review to for example investigate on how well current scientific literature covers a certain topic and if there are relevant gaps within the literature sources. To do so I had to learn to be efficient at reading documents, but I also had to learn where to best find sources that might contribute to the topic. Finding a good stream of sources is a very important task to manage based on my experience, since once you have for example identified an area where researchers exchange their ideas on a certain topic on a regular basis, it is easier to get an understanding on the current state of literature in this area. In my example I identified that there was a working group in the Institute of Electrical and Electronics Engineers (IEEE), which published on a regular basis scientific article about exactly the topic I was investigating. This discovery helped to create a very good literature review.

While doing the literature review, I understood firsthand that creating a research question can only be an iterative process, since by identifying a gap in literature you are inevitably forced to alter your research question to make sure to exactly cover the gap you identify while conducting the literature research. While doing the research proposal outline, I also understood that the research question is influenced by your master thesis. You will for example realize when you try to establish a timeline for your project that your research question might be unfocused. I also learned about the methodology of research and about research design. I learned about quantitative and qualitative research design. I was able to discover quantitative research more closely since this was part of my research proposal outline. I decided in my research proposal to do an experiment, which for me as an engineer is a great fit, since I like to solve practical puzzles and challenges by conducting experiments a lot. But I also feel confident to do qualitative research with questionnaires, interviews etc., since this was covered in detail in the course, too. Additionally, I got a better understanding of statistic and how to apply it, which might be key in my master thesis, since professional analysis of data is likely to be an important item of the thesis. While doing my research proposal outline, I also had to present the aims and objectives of the project. This little exercise showed my that preparation is key, since by setting up

a timeline I reflected on what I am planning to do in my thesis, which made me realize that the research question was too broad because I needed to conduct too many experiments to cover the topic in full. The same is also true for the risk assessment of my thesis, I had to conduct. Here I saw that I had some risks with higher likeliness potentially happening towards the end of the project that might jeopardize the thesis. This realization made me redesign the project timelines and the underlying research question once more.

All the afore mentioned methods and skills I developed during this module are key to provide me for my upcoming master thesis. I am now able to do relevant tasks such as literature review, define a research question, plan my timelines, assess, and mitigate risks that I might encounter during my thesis. I also do have sufficient background on methods like statistics and I also do know enough about the different research designs and methods. This will enable me to have a good outline / a good base for my master thesis.

The literature we should read was also very helpful. Especially the book “Projects in Computing and Information Systems: A Student's Guide” by Christian W. Dawson (2015) was very helpful to me and is likely to be very helpful also for my thesis. The book has so many interesting chapters like “project planning and risk management” or like “Literature searching and literature reviews” that it is hard for me to pick one that stood out. The book is a great guide for many questions that might arise during a master thesis. It was however for sure a great source of additional information for me to conduct this module successfully.

Now the “only” action I must do, is to fill the outline / the base with content such as experiments and a literature review. Whilst knowing this is most of the workload and therefore also a tremendous challenge, I am happy to know that I have the basic structure of my work already planned out and a clear schedule of actions I need to take at which steps along the process. This is the reason, why I am looking forward to the next challenge which will be my Master of Science thesis, for which I feel well prepared.

References

Dawson, C. (2015) *Projects in Computing and Information Systems A Student ’ s Guide*, *Information Systems*.