Rubric research projects. Version January 2024

		SEVERE FAIL (3)	FAIL (5)	PASS (6)	FAIR (7)	GOOD (8)	VERY GOOD (9)	EXCELLENT (10)
1	**Theoretical knowledge & understanding (15%)**							
1.1	can perform a literature study on a (sub)topic of research	Does not understand the literature provided by the supervisor	Has difficulty understanding literature provided by supervisor.	Understands the basics of the literature provided by the supervisor but had difficulty finding additional relevant articles.	Understands the literature provided by the supervisor and has found several relevant additions.	Has studied the literature provided by the supervisor well and expanded their knowledge with further literature they found themselves.	Has found and studied a significant amount of relevant literature based on starting materials provided by their supervisor.	Has independently performed a complete and relevant literature study on a topic provided by the supervisor.
1.2	recalls information and understands theoretical concepts from textbooks and primary literature that pertains to the topic of research	Does not understand relevant theoretical concepts at the MSc textbook level	Has difficulty understanding directly relevant theoretical concepts at the level of MSc textbooks, even when explained by the supervisor, and cannot reproduce them.	Understands and can reproduce directly relevant theoretical concepts at the level of MSc textbooks. Understands directly relevant theoretical concepts from primary literature after additional explanation.	Understands, can reproduce and reformulate to explain directly relevant theoretical concepts at the level of MSc textbooks and scientific literature.	Understands, can recall and explain directly relevant theoretical concepts and can combine information from different sources.	Understands, can recall and explain directly relevant theoretical concepts and can combine information from different sources. Is able to come up with a new piece of theory related to the research with help from the supervisor.	Showed understanding of theory beyond expectations. Has independently developed a new piece of theory relevant to the research.
1.3	can apply theory to predict potential outcomes of experiments and explain results	Is not able to relate theory to performed research	Has difficulty relating theory to the performed research.	Can discuss how theory relates to the performed research, but repeatedly needs additional guidance by supervisors.	Can apply relevant theory to the performed research after being shown how to do so once.	Has applied relevant theory to the performed research without assistance.	Has applied relevant theory to the performed research and can combine or extrapolate theory in a relevant way.	Has independently integrated existing theory from different fields or sources in a way relevant to the research.
2	**Planning and performing research (20%)**							
2.1	can plan research and perform experiments within an appropriate time frame and with the appropriate amount of supervision	Needs constant guidance from their supervisors to plan daily activities	Requires constant guidance from supervisors in planning their days or weeks, also towards the end of the project.	Has basic skills concerning experimental planning, requiring their planning to be adjusted often by themselves or by supervisor intervention.	Mostly good planning of experiments, but sometimes overestimated work that could be done on a short or long timescale or could have planned their days or weeks more efficiently.	Good planning of experiments with realistic expectations of the research that could be done in a day, week and month.	Good planning of experiments with realistic expectations of the research that could be done in a day, week and month, often multi-tasking parallel tasks, but more multi-tasking may improve efficiency.	Is able to plan experiments per day, week and month in an effective and efficient way, often multi-tasking parallel tasks, and shows excellent overall project management skills.
2.2	has the experimental and/or computer skills to apply standard research procedures in a safe way	The student did not work safely in a lab environment and/or the student was unable to perform basic experiments	Practical skills are minimal, only suitable for basic experiments / computations. This did not improve sufficiently during the project and/or student often exhibited unsafe behaviour in the lab / did not pay attention to digital security	Practical skills are adequate for basic, routine or repetitive tasks, but work is often sloppy and inaccurate and/or student sometimes exhibited potentially unsafe behaviour in the lab / when it comes to digital security	Practical skills are sufficient for routine tasks, but more complex experiments / computations required extensive supervision. Was able to work in the lab in a safe way / aware of digital security.	Good practical skills for routine tasks, sufficient skills for more complex experiments / computations. Was able to work in the lab in a safe way / aware of digital security. Sometimes searched for safety information.	Very good practical skills in both routine and complex tasks. Was able to work in the lab in a safe way / aware of digital security. Routinely searched for safety information.	Excellent practical skills in routine and complex tasks, showing an exceptional ability to master new techniques quickly. Actively contributed to a safe (also digital) work environment in the lab for themselves and others.
2.3	can solve procedural problems or difficulties	The student is does not recognize problems	When encountering problems, the student does not recognise there is an issue and/or is unable to continue without a supervisor's direct guidance.	Does not always recognize problems. When encountering problems, usually requires immediate help from a supervisor to continue, but can apply the solution to the same problem next time.	When encountering problems, the student can identify the issue and can come up with an appropriate solution with some help from a supervisor.	Student can solve minor problems independently. Student recognises potential issues and problems, can think of multiple ways to solve the issue and is able reflect on their suitability in a discussion with a supervisor.	Student can solve most problems independently. Recognises major issues, for which student can formulate an appropriate solution before consulting their supervisor.	Student can solve problems independently and also knows when to consult a supervisor to check their approach.
2.4	can make a relevant original contribution to the project	The student did not make original contributions to the project	Has not made an independent contribution to the project and did not attempt to contribute with own suggestions.	Carried out experiments / computations but was not able to make independent contributions to the project, largely because suggestions for the project were irrelevant or not feasible.	Has made some relevant or feasible suggestions for the project.	Has supplied several relevant, original ideas or approaches for the project, some of which were implemented.	Frequently suggested relevant, original ideas or approaches for the project, many of which were implemented.	Has had many original or brilliant ideas that took the research to a whole new level. Regularly impressed supervisors.
2.5	can produce reliable, significant results.	The results are unreliable, key experiments are missing, data is not ordered, results cannot be interpreted, and/or cannot be reproduced	Supervisors feel the experiments / calculations should be redone before results can be trusted.	Supervisors feel the results might be suitable for inclusion in external reports or publications, but thorough checks and possibly duplication are required.	Supervisors trust most of the results and expect some might be suitable for inclusion in external reports or publications after additional checks.	Supervisors trust most of the results and expect those can be included in a publication after additional checks.	Supervisors are confident in the reliability of most results, but some experiments / computations may require complementary work before they can be included in a publication.	Supervisors are confident in the reliability of all the results and have included or would include all results in a publication without hesitation.

3	**Scientific attitude (20%)**							
3.1	takes responsibility for the progress and completion of the project	Showed no interest for the proper progress and completion of the project	Did not demonstrate sufficient care or interest for theprogress and completion of the project within the originally set timeframe.	Showed some responsibility for the progress and completion of the project, but obvious issues were avoided or ignored.	Took satisfactory responsibility for the proper progress and completion of the project.	Generally took responsibility for the proper progress and completion of the project, showing initiative in detecting issues.	Took full responsibility for the progress of the research project, sometimes proposing initiative in solving issues.	Took full ownership of the progress and completion of the project beyond expectation, independently detected and solved issues.
3.2	shows a critical scientific attitude towards their own work and the literature (can analyse results and evaluate their validity and accuracy; can compare and contrast own results to results by others; can formulate scientifically-sound conclusions)	The student did not show a critical attitude towards their own results	Has a very limited critical attitude towards own results.	Has difficulty evaluating their results and literature in a critical way, often requiring a supervisor to point out possible interpretations.	Most of the time showed an appropriate critical attitude towards their own results, but often struggles to apply the same critical attitude to literature and specialist opinion. Sometimes draws conclusions based on too little data or makes other short-sighted interpretations.	Shows a sufficient critical attitude towards their own results, literature and specialists. Mostly able to appropriately evaluate their results and draw sound conclusions, sometimes with input from supervisors.	Good critical attitude towards their own results and literature. Able to appropriately evaluate their results and draw well-founded conclusions independent of supervisors.	Shows a well-balanced critical attitude towards their own results, literature and specialists, allowing them to draw well-founded conclusions and fully oversee the positioning and implications of their own work related to others.
3.3	can communicate about their research in informal settings (on a day-to-day basis with direct supervisor and colleagues)	The student cannot explain what they have been doing in their experiment / calculations.	Was usually not able to explain why certain choices or approaches were made in the daily research setting.	While able to explain the basics of their research, in-depth understanding was missing during informal communication, having to look up details when asked.	Was usually able to explain their current experiment / calculation and its relationship to other experiments / calculations, but struggled with discussing different approaches or defending choices.	Usually had no difficulty relating their experiment / calculation to the bigger picture without preparation, and was able to discuss and defend their experiments / calculations when asked.	Was able to discuss and defend their current experiment / calculation and discuss how it relates to the overall research.	Showed a clear command of the details of the experiments / calculations, approaches and alternatives and was able to discuss the overall research in depth at any time.
3.4	can communicate research progress and results to colleagues, supervisors and experts in progress meetings and work discussions	The student is unable to communicate their results to colleagues. Essential details were always missing. Data was poorly organized.	Showed up to meetings unprepared and/or was not aware of the outcome of own experiments / calculations and/or had major difficulty explaining the results or overseeing the whole project.	Meetings were often inefficient,because student struggled to explain their progress, current issues, did not recognise2 important details or did not prepare well enough.	Communication about research was sometimes inefficient because student had difficulty explaining their research, not separating main issues and details or leaving out relevant details.	Scheduled communication about research was generally efficient, and student mostly joined in discussions.	Presented effective overviews of their research or current issues at any meeting and was able to be an equal partner in discussions about the science of the topic.	Was always well-prepared for meetings, presenting an excellent overview of their project and providing relevant issues to discuss. Was able to engage in in- depth, topical scientific discussions with their peers.
4	**Personal skills (10%)**							
4.1	has English language skills to communicate with fellow researchers	Has major difficulty communicating in English	Level of English communication is insufficient, often causing misunderstanding between supervisor and student.	Weak level of English speaking and comprehension, requiring supervisors and colleagues to simplify their language to communicate.	Sufficient level of English speaking and comprehension to function in the group.	Good level of English speaking and comprehension. Colleagues occasionally had to clarify or rephrase.	Very good level of English speaking and comprehension. Colleagues never had to clarify their English language.	Excellent level of English speaking and understanding, (almost) at the level of a native speaker.
4.2	shows an appropriate work attitude (e.g. being on time, working appropriate hours, being professional) should we describe motivation here? Interaction with colleagues is in 4.3	The work attitude was poor, e.g., the student was regularly absent, while equipment/time was allocated, and others counted on their presence or student was often late	Work attitude was poor and/or student regularly arrived late or left early, showed no motivation for the project. .	Work attitude was mostly sufficient, but student occasionally arrived late or left early. Had periods of poor motivation.	Work attitude was reasonable, but student showed up late or left early once or twice or had a short period of less motivation.	Work attitude was mostly professional, with student rarely showing up late. Generally was motivated to work.	Was always on time, showed a good work attitude and acted professional. Was always motivated to work.	Was impressive in their work attitude. Was always on time, consistently professional and was always focused on their research. Was highly motivated.
4.3	Acts as a team player within a research team (e.g. helps others when needed and is courteous and respectful towards others)	Collaboration with others was non-existent and/or caused conflicts.	Was not seen as a team player and/or did not help others when needed.	Was mostly an invisible colleague, did not interact much with the members in a team.	Had no difficulties functioning in the team, but could have more active in interactions.	Was a good team player, contributed to the overall work environment and would help others when asked.	Was a very good team player, would spontaneously help others and was involved in generating a plesant work environment.	Would make an excellent colleague and showed responsibility for the performance of the whole team.
4.4	responds well to feedback or criticism and has improved themselves as a scientist	The student does not respond or improve upon receiving constructive criticism	Did not respond well to feedback, e.g., got defensive or ignored the comments, and therefore did not improve as a scientist throughout the project.	Sometimes struggled with receiving feedback and was unable or unwilling to change certain things even after repeated comments.	Mostly responded well to feedback, but sometimes struggled to implement it.	Responded well to feedback and tried to act upon it, developing as a scientist during the project.	Responded well to feedback and acted upon it.Sometimes actively sought feedback, strongly developing as a scientist during the project.	Reacted to feedback well, actively sought feedback and acted upon it, very strongly developing as a scientist during the project.

5	**Reporting (25%)**							
5.1	is able to keep good and clear notes of the experiments in their lab journal	There is no lab book, or major parts of the lab book are missing	Lab book is not clear and experiments cannot be reproduced on the basis of the journal alone and/or computer folder structure is not clear and calculations cannot be reproduced.	Lab book contains the basic information; it is a challenge to find results and reproduce experiments and/or calculation input files are difficult to retrieve.	Lab book contains the basic information; it is feasible to find the results but experiment descriptions lack sufficient details. and/or the folders structure can be improved, not all calculations can be reproduced.	Lab book is useable and contains the essential information; it is easy to find the results and most experiments are clearly described and/or based on the structured approach in data storage, most calculations can be reproduced.	Lab book is very clear; it is straightforward to find the results and reproduce experiments and/or based on the structured approach in data storage, all calculations can be reproduced.	Lab book is excellent as a guide to reproduce experiments; all results are clearly described and linked to folders containing the relevant data and/or based on the structured approach in data storage including additional explanation, all calculations can be reproduced.
5.2	can write an accurate report on performed research, with a logical structure and in good academic English (the final product)	The report is not finished	Report is roughly finished but contains errors despite repeated feedback of supervisors and/or misses important parts.	The report fulfils the basic requirements but lacks scientific depth and/or lacks structure and clarity.	The report fulfils the basic requirements and is generally readable but structure, clarity or English could be improved.	Report is free of scientific errors and fulfils the requirements in terms of contents, structure and clarity.	Very good report in terms of content, structure and clarity with good depth of scientific interpretations.	Excellent report in terms of content, structure, clarity and scientific interpretations with exceptional use of academic English.
5.3	can write a report independently (the process)	The student was unable to organize data and write a report	Required extensive corrections and coaching in many iterations by the supervisors to finish the report.	Required multiple rounds of extensive corrections from the supervisors to achieve an acceptable report.	Report was written by the student with support and feedback from the supervisors in multiple rounds.	Wrote the report with only one round of feedback from the supervisors (excluding initial discussions).	Independently wrote an acceptable first version of the report, which required only minor corrections by the supervisors to achieve the final product.	Independently wrote a complete, good report that impressed the supervisors and required little or no feedback or corrections.
6	**Presenting (not the Thesis Talk) (10%)**	**evaluate the performance of the student in presentations for the group (not the Thesis Talk)**						
6.1	can construct a presentation for the targeted audience	The student did not construct a coherent presentation. The majority of the audience was unable to understand the presentation	Content is not chosen properly, or information does not support the topic and claims. Information is unclear or incorrect. Presentation does not match the targeted audience. Presentation is too long or too short.	Content is understandable for direct supervisors only. The goal of the research or presentation is not clear. Story lacks structure or main issues and details are not separated. Some information is unclear or incorrect.	Most colleagues can comprehend the story, but the background or relevance of the research is missing or too much data is presented. All information is correct, but some conclusions are not fully supported.	The goal of the research and presentation is explained well. All information is correct and relevant and supports the main messages.	Appropriate and relevant material is presented and placed into a broader perspective if relevant. Student presented relevant parts of their research. All elements were well-balanced.	The presentation storyline is logical and balanced. Student shows understanding of the theory and practice of their scientific field and can place their own work in context. Conclusions are well- supported and correct.
6.2	Is able to make a clear and attractive presentation	Slide layout is unprofessional or does not support the message. Illegible graphs, text or other visuals.	Slide layout is unprofessional and does not support the message of the research.	Slide layout can be improved on multiple points. Not all figures and graphs are legible.	Slide layout is not optimal but does not distract from the presentation. Figures and graphs are inconsistent but mostly legible.	Slides are mostly well-designed for the purpose and support the message. Figures and graphs are clear.	Slides are all appropriately formatted and look appealing. Figures and graphs are attractive.	Slides are professional and appealing to look at with a uniform design. Figures and graphs are clear, attractive, and self-explanatory.
6.3	has appropriate presentation skills	Student is not able to make comprehensive sentences, cannot explain their research and/or does not face the audience.	Student talks too fast or too quietly, with no eye contact with audience.	Student can still improve on their speaking skills and strongly relies on their notes.	Student is mostly easy to hear but looks mostly at direct supervisors.	Student has a clear voice and makes contact with the audience.	Student uses a clear voice and intonation, speaks at a good pace and has regular eye contact with audience.	Student projects enthusiasm about topic, uses a clear voice and intonation, speaks at a good pace and connects to everyone in the audience.
6.4	can engage in a discussion about their research after a presentation	The student did not engage in a discussion. They were unable to answer the questions and they do not understand how questions are related to their research	Cannot properly defend their results or slides. Does not understand questions, and gives irrelevant or incomplete answers.	Struggles to answer questions, often referring questions to supervisors.	Can reformulate the information on the slides to clarify and answers most questions coherently. Sometimes needs help from supervisors.	Can expand on the information on the slides to clarify and provide additional explanations. Answers to questions are to- the-point and concise, rarely needs help from supervisors.	Answers questions well, showing insight beyond what was presented already and an understanding of the research beyond their own experiments / computations.	Can engage in a critical confrontation of their own results and conclusions, drawing on their own material or knowledge of the literature. Is able to convince the audience of their interpretations.