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MSc Applied Physics
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UNIVERSITY OF TWENTE.

MASTER'S ASSIGNMENT DOUBLE PROGRAMMES AM & AP

Assessment form *(can be filled in digital)*

Name student | Student number

Research group | Cohort | Date of presentation

Title thesis

☐ *The report has been checked for plagiarism by the student.*

Grade Scientific Aspects, code 201900252 EC's 30 | Cum Laude AM Programme ☐

Grade General Aspect, code 201900251 EC's 30 | Cum Laude AP Programme ☐

How to use this form
On page 4 you find the general information and course information. On page 5 and 6 you find the assessment plan. Please read this before the assessment. On page 2 and 3 you will find the tables in which you indicate the strengths and/or the points for improvement for each subject. Subsequently fill in the two grades on page 1. And if applicable, that the master's degree was awarded with "cum laude".
After filling in the form, it has to be signed by the members of the master's final project committee. When digitally signed, after each digital signature the form will be saved. After that, the next one can sign.
Make or save a copy for the student and the research chair and send the assessment form to the office of Education Affairs: **BOZ-AM**, Paviljoen, BOZ-AM@utwente.nl **and BOZ-AP**, Paviljoen, BOZ-AP@utwente.nl

Master's Final Project Committee

	Titles and name	Affiliation	Signature[1]
Chair			
Daily supervisor			
Reference member[2]			
member (optional)			
member (optional)			
member (optional)			

[1]*Link to: How to Create a digital signature in Adobe Reader*

[2]*A member of a chair in the discipline committee Applied Physics other than the chair in which the final project is carried out.*

Scientifical aspects of assessment

	Comments and feedback
Research plan and positioning	Strong points
	Points for improvement
Theoretical and experimental skills	Strong points
	Points for improvement
Analysing skills	Strong points
	Points for improvement
Scientific approach & handling of complexity	Strong points
	Points for improvement
Integration Mathematical and Physical Aspects	Strong points
	Points for improvement
Reflective capabilities	Strong points
	Points for improvement

General Aspects Grade

	Comments and feedback
Reporting	Strong points
	Points for improvement
Oral presentation & discussion	Strong points
	Points for improvement
Professional research attitude	Strong points
	Points for improvement
Professional communication	Strong points
	Points for improvement
Arrangement of own work within conditions of research group	Strong points
	Points for improvement

Course information and assessment plan
Double Master Assignment AM-AP

General information

Course name, -code:	• MSc Assignment AM-AP: Scientific Aspects: 201800538 (30-35 EC) • MSc Assignment AM-AP: General Aspects: 201800537 (30-35 EC)
Lecturers (chair of the MGC is examiner/coordinator):	The MSc Graduation Committee (MGC) is responsible for the supervision and assessment. The committee consists of at least three members, who must hold a doctoral degree (PhD). The responsible examiner serves as a chair of the committee . The composition of the MGC must comply with the rules that apply to both the Applied Mathematics and Applied Physics programme.
Determining pass mark:	In the assessment of the MSc assignment, two marks will be determined: (i) One grade covers the quality of the scientific, mathematical and physical aspects and the research performance, (ii) One grade covers the other objectives, concerning the oral and written reporting as well as other general aspects of the research. For each mark a distinct course code has been assigned. The assignment can only be finalized when both grades are six (6) or higher.

Course Description

Course objectives

The main objective of the assignment is that the student learns and proves that (s)he is able to define, perform, complete and reflect on a research project in the applied physics and mathematical domain with a large degree of independence.
In the master's assignment, the objectives of the Applied Physics and Applied Mathematics programme are met, which focuses on acquiring most of the learning outcomes of the complete programme;

- a thorough knowledge of the basic physics and mathematics theories,
- a more in-depth knowledge of one or more sub-areas of physics and mathematics,
- knowledge of physical and mathematical technology, including skill in designing and applying measuring equipment and experimental techniques,
- orientation in the application areas of applied physics and applied mathematics,
- insight into how the sciences are interconnected and the relation between science and society and the resulting responsibilities,
- skills such as being able to acquire knowledge independently; being able to contribute creatively and systematically to solving issues relating to the subject area; being able to work with colleagues,
- in and outside the discipline; and communicative, social and organizational skills.

General aspects that will be assessed include;

- Reporting,
- Oral presentation & discussion,
- Professional research attitude,
  Professional communication,
- Arrangement of own work within conditions of the research group.

Course Content

The individual master's assignment comprises the completion of the double master programme Applied Physics and Applied Mathematics. The assignment is performed in one of the research groups within the Applied Physics or Applied Mathematics domain of the University of Twente under the supervision of a researcher with a doctors degree and the responsibility of a master's final project committee.
The assignment can be performed (partially) within a research group outside the domain of Applied Physics and/or Applied Mathematics or an external institute or organization. This needs the approval of the master's examination boards of Applied Physics and Applied Mathematics.
The student has to perform a substantial research or design project that meets scientific criteria. The level of profundity and complexity is defined by the chair of the MSc graduation committee. The student completes the assignment with a written report (the MSc thesis) and an oral public presentation.

	Component	Sub-component	<5.5 (Fail)	6 (Sufficient)	8 (Good)	10 (Excellent)	Grade	Weight	Final grade
Physics Aspects	Research planning and positioning	Planning	Unable to effectively plan a project. Does not leave room for setbacks. Unable to meet deadlines.	With some help a research plan was made by the student. Does not leave room for setbacks, sometimes misses deadlines.	Can make a research plan including some room for setbacks or change of plans. Not all deadlines are met.	Can make and execute a planning, including leaving room and flexibility for setbacks, and possible change of research direction. Meets all deadlines.		0,1	
		Positioning	Lacks the understanding of the implications of this subject matter on the topic of the thesis in general.	Understanding of the implications of this subject matter on the topic of the thesis is sometimes lacking	The student is aware of and can reflect on some of the implications of this work and current discussions in the literature related to the thesis topic.	The student is aware and able to reflect on the implications of this work and discussions in the literature beyond (but related to) the topic of the thesis.			
	Theoretical and experimental/ computational skills	Use of scientific literature	The student was unable to grasp the current state of the topic in the literature	The student understand and uses literature which has been suggested by the supervisor(s)	The student has found most of the relevant literature and can discuss and explain the contents	Has independently performed a detailed literature study and is able to explain in detail the current state of research		0,3	
		Application of scientific knowledge	Is unable to apply the relevant scientific knowledge to the project.	Is able to apply the relevant scientific knowledge to the problems of the project with some difficulty or with help of the supervisor(s).	Can independently apply scientific knowledge to their own project, with little help of the supervisors.	Can apply, fully independently, state of the art scientific knowledge to the research project.			
		Experimental/ computational skills	The student is unable to perform independent (computational) experiments of the level taught in the programme, required for the research	The student was able to perform rudimentary (computational) experiments with little help and sufficient to complete the research	The student can indepedently perform (computational) experiments to solve the research question	The student has extended the computational tools or the experiment, beyond what was available, and performed novel experiments			
	Analysing skills	Problem analysis	The student is unable to analyse a problem and extract and understand the fundamental mechanisms at play.	The student is performed a basic analysis of the problem together with the supervisor and understands the mechanisms.	The student performed a detailed analysis of the problem and understand the physical mechanisms at play.	The student is fully able to analyse the problem, understand the physical mechanisms at play, and can make predictions based on that.		0,3	
	Scientific approach and handling of complexity	Scientific method	The student is unable to follow the scientific method of question, hypothesis, experiment/computation, analyze, report, question	The student is able to follow the scientific method with help of the supervisor.	The student uses the scientific method with little help of the supervisor.	The student uses the scientific method independently and critically.		0,15	
		Dealing with complexity	The student is unable to handle complexity and is reliant on the supervisor for understanding.	The student is able to, with some help of the supervisor(s), to dealh with the complexities of the problem.	The student is able to aquire missing knowledge and apply it to the complexity of the problem	has the skill to independently apply the obtained knowledge in the context of more advanced ideas or applications			
		Creativity	The student does not show any creativity.	Student has fulfilled the basic parts of the project to finish the assignment, with minor creative input.	Part of the work originates from the student's creative ideas. The direction is augmented/ guided the supervisor	The student is in the lead in choosing the steps taken in the project, contributing creatively towards new approaches			
	Reflective capabilities	Critical approach	The student almost never questions the correctness of the data. The validity of the outcome is very uncertain	The student is critical to part of their own results, but not in general. Validity of the results has to be verified.	Can evaluate the reliability of own results, and questions the reliability of results from external sources (literature or specialists).	Critically evaluates the reliability of own results, and can judge whether results from external sources are reliable.		0,15	
		Skill to recognize what is important	The student cannot distingish major from minor problems, even after input from supervisor	The student can distingish major from minor problems after input from supervisor	The student is able to distinguish and makes choices, with little help of the supervisor(s).	The student is independently fully ableand makes choices accordingly.			

General Aspects	Reporting	The report is properly structured	The report lacks any structure and cohesion	The report exhibits basic structure	The different sections are partially connected, reference each other, and form a partially cohesive story	The different sections are fully interconnected and form a cohesive story		0,3	
		The report is clearly written	The report, including the figures, is difficult to read and fails to deliver the main message	Report is difficult to read, lacking proper argumentation, and a general message is barely conveyed	Well readable and most arguments and messages have been clearly described	The level of a scientific publication, engaging the reader, conveying a clear message supported by high-quality figures and illustrations.			
		The report uses proper English	The report contains numerous grammatical mistakes, incoherent sentences. The level is unadequate for a scientific environment	The report is written using a minimal level for a scientific environment, only contains minor mistakes	The report is written at an advanced level, and lacks grammatical mistakes	The report is written at a high level including the correct use of technical terms			
	Oral presentation and discussion	Depth of argumentation	The student is unable to provide basic argumentation in response to questions	The student is able to provide basic arguments, supported by some physical laws/concepts	The student has detailed argumentation for most of the questions using physical laws/concepts	The student replies the questions referencing literature and uses argumentation using fundamental physical laws/concepts		0,2	
		Quality of the presentation	The lay audience nor experts are able to extract useful information. The presentation lacked structure	Basic information could be extracted from the presentation. Structure is basic, and visual aids are used minimally	Audience was able to extract the main message. The presentation structure was clear with some visual aids	Engaging presentation with clear structure and using clear visual aids to explain their story			
	Professional communication and collaboration Professional research attitude	Independence	The student was dependent on the supervisor(s) for continuous steering, no responsibility taken	Takes regular steering from the supervisor(s). Takes the bare minimum of responsibility for the project.	Can mostly work independently. Needs some steering. But takes responsibility of the project	Takes charge of the project, proactively and independently, with little steering of the supervisor(s). Takes full responsibility		0,2	
		Dealing with criticism	Non-responsive or defensive towards critisism in a counter-productive or demotivating way.	Sometimes responds in a defensive way to critisism, or only weakly responds to critisism.	Handles critisisms in a positive manner and learn from critisisms from the supervisor(s).	The student is pro-actively searching for critisism to improve their research project.			
		Level of English	Is not able to write nor converse at a sufficient level for a scientific environment	Is able to write and converse at a sufficient level for a scientific environment	Comfortable communicating in English spoken and written	Flawless use of academic English, including jargon, both written and spoken			
		Communication	Does not communicate the progress of the project with the supervisor(s).	Only communicates the bare minimum to update the supervisor(s) on the progress of the project, but mainly on inquiry by the supervisor(s).	Pro-actively communicates the progress of their project and has lively discussions and actively shared ideas with the supervisor(s).	Clear communication between the student, the supervisor(s), and other researchers resulting in a beneficial and stimulating scientific environment.		0,3	
		Colleboration	Creates conflict and generally is difficult in interactions	Does not really engage but functions	Interacts well with other, is helpful in other projects	Actively engages with other and creates synergy in the group.			