Part 1: Assessment Form Double Bachelor Physics & Mathematics (NS-320B)

Use of this form, including assessment score form (Part 2), is mandatory for all double bachelor thesis research projects Physics and Mathematics. It must be filled out and signed by both project supervisors and sent to the administration office (h.j.a.cunen@uu.nl).

Student	
First and last name	
Student number	
Telephone	
Email address	
Research Project	
Project title	
Number of EC (15 for regular project)	
Honours project (yes, no)	
Project supervisor Physics	
Name and title (must be staff of the Department of Physics holding or in training for BKO)	
Email address	
Project supervisor Mathematics	
Name and title (must be staff of the Department of Mathematics holding or in training for BKO)	
Email address	
Experts: if internal or external experts have been consulted, please note them here	
Name and title	
Affiliation	
Email address	

Assessment in words

Describe the project and assess the performance of the student using the protocol as set up in Part 2 of this form. Determine the strong and weak points of the student's work. Please address the three main aspects of the project, i.e. Research skills and results, Thesis knowledge/content, and Oral presentation. The final grade should be determined on the basis of the assessment criteria listed in Part 2 and along the rules described in Part 3 to ensure an equalized assessment of the research projects and to offer clarity to the students and board of examiners about the assessment.

Additional points that affect the assessment but do not become apparent in the assessment of Part 2 should be thoroughly motivated by the first reviewer. The final grade may deviate from the 'target final grade' (see Part 3, supplemental information) by a maximum of ±0,5 points.

Category grades and final grade

Plagiarism check:	☐	Thesis publicly available (see supplemental information)		☐ Yes ☒ No	
Research skills: A		Thesis: B		Oral presentation: C	
Final grade:		(this grade will be recorded in OSIRIS and included in the student's grade list)			

Signatures

Project supervisor Physics **Herewith the supervisor confirms that this assessment has been discussed with the Mathematics supervisor and the student.**	Date: Name: Signature:	
Second reviewer **Herewith the supervisor confirms that this assessment has been discussed with the Physics supervisor, the reading committee and the student**	Date: Name: Signature:	

Part 2: Category grades (combined Physics and Mathematics reviewers)

Grade A: Research skills and results (50%)

Grade:

Comment/subgrade[1]:

A1: Background knowledge

_____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Missing or unrelated to the project.	• An appropriate overview of prior knowledge.	• Excellent overview of prior knowledge • New concepts and techniques are understood and the broader context is seen.

A2: Research question(s)

_____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Missing or is not related to the research field and/or approach.	• Appropriate formulation of research question(s).	• Excellent and clear. • Follow logically from given state of the art knowledge.

A3: Design and execute research plan

_____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Executes only plans devised by the supervisor. • Has problems comprehending and executing plans devised by the supervisor.	• Proposes new valid calculations or measurements based on previous results. • Has creative ideas.	• "Owns" the project. • Proposes many new, relevant calculations or measurements • Student has original, creative ideas.

A4: Experimental/theoretical approach

_____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• There are significant shortcomings. • The approach is inappropriate/illogical. • Fails to produce meaningful results.	• Appropriate implementation of the approach. • It is clear that the research questions can be addressed.	• Excellent implementation of the approach. • Alternative approaches are considered and the chosen approach is the most appropriate to address the research questions. • Potential difficulties/problems are seen and avoided/solved in a smart/ingenious way.

A5: Data analysis and interpretation

_____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Depends on supervisor for correct interpretation of results. • Invalid statistical analysis.	• Provides correct analysis and interpretation of results.	• Provides correct analysis and interpretation of results from the start of the project. • Recognizes implications of his results in a broader scientific and societal context.

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[1] The examiners are strongly encouraged to supply a written comment (one word is sufficient) or a subgrade for each item, as feedback to the student and to supplement the 'assessment in words' in Part 1.
If subgrades are specified, the grade is not necessarily equal to the arithmetic mean of the subgrades.

A6: Professional attitude   _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Fails to work independently (e.g. cannot perform simple tasks or calculations without constant input).	• Works independently to solve well defined problems.	• Works independently. • Solves most problems him/her-self.

A7: Social skills   _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Does not act as a member of a research group. Not responsive to advice.	• Works well together and takes initiative, becomes easily part of a group. Asks others for advice and helps others when necessary.	• Exceptional social skills.

A8: Integrity   _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Data manipulated or left out.[2]	• Accurate, reliable and trustworthy. • Shows awareness of confidentiality of information.	• Exceptionally accurate, reliable and trustworthy.

A9: Critical attitude   _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Critical attitude is absent.	• Has critical attitude towards (published) research.	• Critical attitude is based on intellectual depth and profundity.

Grade B: Thesis (35%)   Grade:

Comment/subgrade[1]

B1: Background information   _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Missing or unrelated to the project.	• An appropriate overview of prior knowledge is given.	• Excellent overview of prior knowledge. • New concepts and techniques are explained and put in a broader context.

B2: Research question(s)   _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Missing or is not related to background information and approach.	• Appropriate formulation of research question(s).	• Excellent and clear. • Follow logically from given background information.

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[2] In case of fraud or plagiarism, the reviewers will inform the Board of Examiners.

B3: Experimental/theoretical approach   _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• There are significant omissions. • The approach is inappropriate/illogical. • Fails to reveal how results were obtained.	• Appropriate description of the approach. • It is clear that the research questions can be addressed.	• Excellent description of the approach. • It is clear why the chosen approach is the most appropriate to address the research questions. • Crucial steps are identified and highlighted. • Context is provided w.r.t. alternative approaches.

B4: Presentation of the results   _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Unclear whether results are useful to address research question. • Missing or inadequate treatment of errors and uncertainties.	• Clearly visible that the results relate to the research question. • Appropriate treatment of uncertainties and errors.	• Excellent presentation of results. • Results are appropriate to gain deeper conceptual understanding of some aspects related to the research question. • Excellent treatment of uncertainties and errors.

B5: Discussion and conclusions   _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Basic knowledge of physics is insufficient. • Inappropriate and wrong conclusions. • Data inadequately discussed, sticking rigidly to existing concepts or using invalid arguments. • Conclusions weak or not supported by evidence.	• Demonstrates sufficient knowledge and understanding. • Demonstrates sufficient understanding of techniques and concepts. • Relation data and research question discussed adequately, using valid arguments. • Conclusions in line with presented evidence.	• Excellent in depth discussion of data in relation to research question. • Critical discussion in the light of the specified errors and uncertainties • Excellent discussion of how the data relate to current knowledge of the subject, and suggestions for future research.

B6: Quality of the references   _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Missing or unrelated to the content[2]	• Appropriate to make the point.	• Excellent/varied choice of literature.

B7: Structure   _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Clear structure is absent or the content of the sections is often inappropriate (e.g. details of the method explained in the result section, etc.).	• Clear structure visible with following mandatory sections: Abstract, Introduction, Method, and Result/Discussion section(s). • Content in the sections is generally appropriate. • References are provided in a consistent style.	Additionally: • Content in the sections is always appropriate and is presented in an exceptionally well-considered way.

B8: Tables and Figures _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Figures and tables missing, irrelevant, or ill-presented.	• Figures and tables can be understood without additional information.	• Figures and tables are clearly presented and self-explaining. • The layout of figures and tables is of high quality (publishable).

B9: Writing Style _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Style too wordy or too concise. • Severe and numerous spelling or grammar mistakes.	• Use of language, grammar and spelling sufficient.	• Grammar and style support legibility of the document. • Writing flows smoothly.

Grade C: Oral presentation (15%)

Grade: _____

Comment/subgrade[1]

C1: Content and structure _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• The presentation is not easy to follow and conclusions do not always follow from data. No or weak discussion of the results.	• Provides a reasonable view of the research, but the presentation can be clearer. Line of reasoning and how the conclusions were reached are not always clear. Fitting the research into a broader framework is not adequate at all points.	• Excellent structure, relevant introduction which connects with the aims of the study, fascinating results, good graphics, excellent discussion, clear implications with perspectives on future research.

C2: Presentation skills _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• Poor slides, no contact with audience, cannot answer questions.	• Knows how to retain the interest of listeners. Slides provide the audience with necessary information.	• Professional presentation in all aspects.

C3: Interdisciplinary Style _____

Insufficient (<6)	Satisfactory (7-8)	Excellent (>8)
• The two presentations are "the same", no consideration for the respective target audience is shown in this regard.	• The student gives the minimally requisite background to the field with which the target audience is assumed not to be familiar.	• The student has carefully considered the audience in crafting both presentations and makes use of, e.g., analogies and aids to convey those aspects that the audience will not be familiar with.

Part 3: Supplemental information

Guidelines for obtaining the final grade

1.   The final grade is a combination of the subgrades (A, B and C):

A: Research skills   weight 50%
B: Thesis   weight 35%
C: Oral presentation   weight 15%

2.   The above subgrades are determined using the rubrics in Part 2, which should be considered a guideline for the supervisors to structure their "Assessment in words" section of Part 1. It is important to identify how well the student did within the context of the individual disciplines, as well as how well they managed to merge these.

3.   It is recommended that both supervisors propose subgrades and discuss possible difference between each other, in order to reach a common conclusion.

4.   The minimum grade necessary to pass is 5.0 for all subsections.

5.   A target final grade is calculated according to:

target final grade $= 0.5 * \text{Grade}_{\text{Research skills}} + 0.35 * \text{Grade}_{\text{Thesiss}} + 0.15 * \text{Grade}_{\text{Oral presentation}}$

6.   The final grade may deviate from the target final grade by 0.5 points and this should be adequately justified in the written motivation for the final grade (Part 1). It is recommended to use (up to) +0.5 points to reward excellent interdisciplinary research, for instance.

7.   After the mark is finalized and the document submitted, the marking can be evaluated by the "Reading Committee" of the Mathematics department. This does not impact the final mark.

8.   Rules for extensions and retakes are described in the Education and Examination Regulations.

Availability thesis

On upload in Osiris the thesis will by default not be publicly available. Deviations from this default are only possible under special circumstances in consultation with the educational director.