



General aspects

Evaluation points	Remarks and feedback
<b>Reporting</b>	Positive points:  Suggestions for improvement:
<b>Verbal presentation &amp; discussion</b>	Positive points:  Suggestions for improvement:
<b>Research attitude</b>	Positive points:  Suggestions for improvement:
<b>Professional communication</b>	Positive points:  Suggestions for improvement:
<b>Research independence</b>	Positive points:  Suggestions for improvement:

Scientific aspects

<b>Research plan and context</b>	Positive points:  Suggestions for improvement:
<b>Theoretical and/or experimental skills</b>	Positive points:  Suggestions for improvement:
<b>Analysis skills</b>	Positive points:  Suggestions for improvement:
<b>Scientific approach &amp; handling of complexity</b>	Positive points:  Suggestions for improvement:

Learning objectives	Assessment criteria [weight]	≤ 5	6	7	8	9	10
1	<b>Problem formulation / definition of research area</b> [middle]	Unclear	Widely formulated	Clear and specific	Clear, specific and well defined	Clear, specific, well defined and original	Excellent and innovative
7	<b>Searching, consulting and usage of literature (and other scientific material)</b> [middle]	Hardly any connection to the scientific literature	Some scientific literature is mentioned	Satisfactory overview of the scientific literature	Clear overview and partly critical description of the	Critical evaluation of the scientific literature	Excellent; critical and in- depth evaluation of the scientific literature
1, 2	<b>Approach / design of research (incl. research plan)</b> [high]	Disorganized	Limited description; unclear motivation	Satisfactory description; appropriate motivation	Clear description; good motivation	Very thorough description; critical motivation	Excellent description; original and innovative
8	<b>Conclusions &amp; recommendations / scientific contribution</b> [high]	Unclear	Clear but not based on the reported results	Conclusions based on reported results; satisfactory recommendations for future research	Conclusions are properly connected to the reported results; good recommendations for future research	Well-thought-out conclusions; original recommendations for future research	Excellent; original and innovative scientific contribution

6	If applicable: <b>Indication of the importance and restrictions of the mathematical analysis with regard to a social issue</b> [ <i>low</i> ]	Unclear	Clear but not based on the reported results	Based on the reported results; satisfactory recommendations for the social issue	Properly connected to the reported results; good recommendations for the social issue	Well-thought-out conclusions; original recommendations for the social issue	Excellent; original and innovative recommendations for the social issue
8	<b>Integration of knowledge acquired in the bachelor programme AM</b> [ <i>high</i> ]	Insufficient	Sufficient, but not independently applied	Satisfactory; a small part is independently applied	Good; partly independently applied	Very good; largely independently applied	Excellent; completely independently applied in an original and innovative way
8	<b>Relating mathematical results to each other</b> [ <i>middle</i> ]	Insufficient	Sufficient	Satisfactory	Good	Very good	Excellent; shows in- depth insight into the problem and interconnections.

**Double Bachelor Applied Mathematics- Applied Physics**  
**Assessment form – Bachelor’s assignment**

**Test scheme bachelor’s assignment**

Module level		Osiris level			Subject level		
Topic	min. grade	Subject	min. grade	Weight	Subject <sup>4</sup>	Way of assessment	Weight (Approximately)
Bachelor’s assignment	≥ 5,5	General aspects	≥ 5,5	50%	Learning objective 1	Progress meeting with supervisor(s)	10%
					Learning objective 2	Attitude during the assignment and meetings	20%
					Learning objective 3	Observation from the supervisor(s)	10%
					Learning objective 4	Report	30%
					Learning objective 5	Presentation and discussion	20%
					Learning objective 6	Context in report and presentation	10%
		Scientific Aspects	≥ 5,5	50%	Learning objective 7	Context in report and presentation	20%
					Learning objective 8	Observation supervisor(s); report; presentation	80%

<sup>4</sup> The learning objectives are specified on the last page.

<p style="text-align: center;"><b>Learning objectives</b></p> <p>After finishing the bachelor's assignment, the student is able to:</p>	<p style="text-align: center;"><b>Way of assessment</b></p>	<p style="text-align: center;"><b>Weight</b> <i>(Approximately)</i></p>
1. Organize and plan a research project combining Applied Mathematics and Applied Physics disciplines, from problem analysis to inclusion of feedback.	Progress meeting with supervisor(s)	5%
2. Demonstrate independence in the preparation and implementation of a research project, including use of critical scientific thinking.	Attitude during the assignment and meetings	10%
3. Function professionally, in terms of communication with other students and teachers, as well as collaborate within the research community.	Observation from the supervisor(s)	5%
4. Provide a clear, structured, content-based, written report	Report	15%
5. Verbally present his/her research, through a clear, structured, content-based presentation, including discussion and questions/answers with a scientific audience (other students, graders, etc).	Presentation and discussion	10%
6. Place his/her research in a social context, as well as take into account safety, environmental, and ethical issues.	Context in report and presentation	5%
7. Gather, select and process relevant scientific information with the use of concept and theories from the relevant field, including state of the art.	Context in report and presentation	10%
8. Conduct Applied Mathematics and Applied Physics research at the level expected of a final year BSc student, including using a systematic/logical approach to: Problem analysis, formulation of research question, theoretical and/or experimental methods, data collection, and analysis (including computations where necessary); and to be able to explain, with reasoning, why these approaches have been chosen.	Observation supervisor(s); report; presentation	40%

Learning objectives 1 to 6 determine the general aspects (=50%); learning objectives 7 and 8 determine the scientific aspects of the assignment (=50%).

## **Course information**

### **Course description**

The Double Bachelor program in Applied Mathematics (AM) & Applied Physics (TN) ends with the bachelor's assignment. The bachelor's assignment is a research assignment of sufficient scope and complexity for both the AM and AP bachelor's program. The conducted research contributes to the scientific literature. The student shows that (s)he is a critical and independent researcher who can communicate the results to fellow students in writing and verbally.

This allows the student to apply the knowledge and skills gained from experiments, use of theoretical models, data analysis and verbal and written presentations throughout the entire Bachelor degree to a real area of research.

### **Course content**

The student is responsible for contacting a research group. The assignment then begins with an introduction and a literature study. Then the student must design a suitable research proposal (the research group will help with the latter) and make a planning. This enables the student, with appropriate supervision, to address the research question.

Before the student starts the assignment, (s)he must submit the assignment description and the names of the members of the graduation committee (supervisors) to the coordinator of the AM Bachelor's Assignment and Register your graduation project twice in Mobility online, once for AM and once for TN. the bachelor coordinator of TN checks whether the committee meets the TN requirements.

The research proposal must contain sufficient scope and complexity to satisfy the requirements of a bachelor's assignment. It also fits within the framework of ongoing scientific research of the host research group. Throughout the project, the student discusses progress with the supervisor and teacher and adjusts the future direction as appropriate.

The Bachelor assignment ends with a written report in the form of a scientific article, a 5 minute pitch and poster at the Bachelor Conference for AM and a verbal presentation, at the level expected of B3-students of AM & APh.

Assessment is done by the entire bachelor's assignment assessment committee.