1. COMPETENCE: RESEARCH

Within the Applied Science domain, the Bachelor of Science conducts research that either contributes to solving a problem or developing a method, or leads to greater insight into a subject within his professional environment.

	Level I	Level II	Level III	Level IV
	The student *performs simple research in response to a problem statement and setup provided.* He demonstrates this by:	The student *makes a major contribution to a research strategy provided and conducts the research.* He demonstrates this by:	The student *translates a problem provided into a research strategy and conducts the research.* He demonstrates this by:	Experienced professional (see description of competence above). He demonstrates this by:
a. Setting an objective for the research assignment	Communicating with the client about the problem and the objective of the research	Analysing a problem in consultation and in a coordinated way and translating it into the objectives of the research assignment.	Analysing, independently, a problem provided and translating it into the objective of the research assignment.	Analysing a problem independently and translating it into the objective of the research assignment.
b. Using literature or sources	Gaining an insight into the professional aspects of the research by studying the literature or sources provided.	Gaining an insight into the problem and the professional aspects of the research by studying the literature or sources the student has selected.	Selecting and obtaining, without assistance, scientific and other literature or sources in order to study the problem in greater depth, thereby validating the reliability of the different sources of information.	Selecting and obtaining, without assistance, scientific and other literature and/or sources in order to study the problem in full depth, thereby validating the reliability of the different sources of information.
c. Determining the research design	Explaining the relationship between the research question provided, sub-questions and research activities.	Formulating, under supervision, sub-questions and research activities regarding the research to be carried out.	Formulating, without assistance, sub-questions and research activities regarding the research to be carried out.	Formulating, without assistance, sub-questions and research activities regarding the research to be carried out.
d. Drawing up a work plan for research	Developing an approach to carrying out the research activities of a simple research assignment according to a format provided, including the planning of the work.	Preparing a work plan in consultation, drawing up the plan independently, taking account of any preconditions.	Preparing a work plan without assistance, taking into account the interdependencies of various research activities and preconditions.	Methodically drawing up a work plan, allowing time for evaluation and adjustment and taking account of preconditions and uncertainties.
e. Carrying out the research activities and obtaining the research results	Working in accordance with the work plan when carrying out the assignment and finding effective ways of achieving the intended results. Applying basic knowledge or skills.	Working in accordance with the work plan when carrying out the assignment. Implementing the work plan effectively and efficiently and determining whether interim adjustments are necessary on the basis of interim results. Applying relevant knowledge or skills.	Implementing a complex work plan effectively and efficiently and updating it as necessary in between times. Acquiring relevant knowledge and putting it into practice.	Implementing a complex work plan effectively and efficiently and working with dynamic scheduling as necessary. Acquiring relevant knowledge and putting it into practice.
f. Processing and checking data	Summarising the data from the research activities, structuring it in the light of the research question and presenting it clearly. Reflecting critically on the results to determine whether they are realistic.	Summarising and interpreting the full or partial results in relation to the assignment/ research question. Critically reflecting on the reliability of the results.	Logically and clearly combining the full or partial results and interpreting them in relation to the research question. Performing an analysis of the reliability of the results.	Summarising, structuring and interpreting the results in relation to the research question. Ensuring that the results are reliable.
g. Formulating research conclusions and recommendations	Using the research results to formulate conclusions relating to the research question and if necessary submitting a proposal for improving the implementation of the assignment/the research.	Using the research results to formulate conclusions relating to the research question and using these to make a proposal for follow-up steps.	Using the research results to formulate and interpret conclusions relating to the research question. Making proposals for follow-up research based on the conclusions.	Making proposals for follow-up research based on the conclusions and other insights. Continue on page 80 →

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h. Reporting	Reporting orally and/or in writing on the assignment in accordance with specified guidelines.	Combining the results into one report in accordance with the applicable guidelines/ standard.	Reporting on the research in accordance with the standard applicable in the professional field.	Reporting on the results of the research in accordance with the standard applicable/valid in the professional field.
i. Cooperation and communication	Actively working as part of a team, processing the feedback on the work delivered to achieve better results. Being able to communicate concisely about goals and results as the work progresses.	Acting as a full team member in the student's working environment, where feedback and reflection lead to better results, reasoned choices and effective coordination in conducting the research. Being able to match communication on progress to the situation.	Acting as a full member and working as part of a team which also contains staff from other professional field(s). Communicating independently about the relevant substantive aspects of the progress.	Collaborating in a result-oriented way in a multidisciplinary setting. Communicating and reporting effectively on progress and coordination.

Definitions Competence Research

- Research involves working on an issue such as solving a problem, developing a method or gaining a greater understanding of a subject. Where the word '**problem**' is used in the competence indicators, it can also refer to a type of issue other than solving a problem. The word 'question' has deliberately not been used so as to avoid confusion with the term 'research question'.
- **Provided** indicates that there is a client who makes demands on, or has expectations of, the result. This is a higher level than a student who devises and conducts his or her own research in which the result or the quality of the result is of no importance.
- **Research strategy** concerns the objective, the research question and the design of the research.
- **Preconditions** relate to available resources (availability of resources in the widest sense), quality assurance (which also includes management measures), safety, health, welfare, the environment, sustainability and ethics.
- **Work plan** involves as a minimum the objectives, the design, the approach, the preconditions and the planning.
- **Complex work plan** is used when, for example, the plan is on a large scale in terms of duration and involves a multitude of substantive aspects, strict requirements for the quality of the results, multiple disciplines that need to be managed, a high risk factor or a lot of interaction and communication.
- **Follow-up steps** concern new objectives for solving the problem, developing a method, gaining insight into a subject or any other type of follow-up research.
- **The follow-up to a research assignment** may involve, for example: follow-up research, using a developed method, developing a product or ending work on a development.
- **Dynamic scheduling** produces a schedule that is not fixed in advance, but is constantly updated based on the results obtained.
- The **reliability** of the results can be derived from statistical calculations, but also from other calculations, literature or additional experiments.