The Graduation Year

Bioinformatics programme

University of Applied Sciences

Leiden

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Contents

1 Introduction

Ever since the successful sequencing of the human genome in 2001, a quiet revolution has taken place in bioscience. Research laboratories have since been able to collect vast quantities of biological data with relative ease yet the analysis of these data by bioinformaticians is now slowing down the progress of research. In the coming years, The Netherlands will require thousands of additional bioinformaticians.

The University of Applied Sciences Leiden started the four year, full-time Bioinformatics bachelor's degree in 2003. Learning in and with the professional field plays a predominant role in the teaching programme of the Bioinformatics degree. Students can work on assignments supplied by the professional field from as early as their second year. The fourth year is reserved for a graduation work placement. Here, the student learns how to function as a bioinformatician in the workplace. This represents a very important component of the course because the occupational field requires independent, self-responsible and creative professionals who are capable of adequately solving problems, in constantly changing circumstances. This presupposes insight into relevant professional situations, oversight of the spectrum of specific actions and a reflection of their own capabilities. The graduation assignment forms the conclusion of the course and is essentially an assessment to confirm the competences that a professional starting out in the field is required to possess.

The Bioinformatics course at UAS Leiden distinguishes itself as a course where the desired occupational profile is central. Only then can the accumulation of knowledge and skills take place efficiently and effectively in the context of the professional field.

This document covers the different aspects of the graduation year to offer clarity to the student and the work placement provider.

The assessment documents are not included in this document. These can all be found in the zipfile (bafstu_documenten_<collegejaar>.zip). The files in the zipfile are updated every academic year.

Where the word "he" appears in this document, "he" or "she" is meant. Where "his" appears, read "his" or "her".

Definitions

Graduation coordinator	The coordinator for graduation of the course Bioinformatics at UAS Leiden.
Graduation teacher	The UAS Leiden teacher who supervises the student and conducts evaluation meetings.
Graduation plan	A plan of action which focusses on describing the company/institution at which the student graduates, the activities and work undertaken there and the planning.
Graduation placement-application form	Form which the student fills in stating where he wishes to graduate and which assignment he wishes to complete there. This form is presented to the student career supervisor and the second teacher for approval.
Graduation report	The final report written by the student in which the assignment execution and the results are described.
Graduation	Period of 40 calendar weeks in which at least 190 days of 8 hours is dedicated to the graduation assignment. The commencement date can vary per person.
DLE (DLO)	Digital Learning Environment at UAS Leiden.
Examiner 1	The graduation teacher who chairs the graduation sitting and provides the intermediate and final assessments for the graduation.
Examiner 2	A teacher at UAS Leiden, appointed by the graduation coordinator, who provides the final assessment for the graduation.
Gradework	Place where students can hand in documents digitally and where teachers can assess this work.
EER (OER)	Education and Examination Regulations of the course. The EER is definitive in case of ambiguity or contradiction with this document.
(the) Course	The BSc degree course Bioinformatics at UAS Leiden.
Placement contract	Contract which is entered into at the beginning of the graduation between the student and the placement supervisor detailing agreements relating to the graduation.
Placement provider	The company or institution where the graduation takes place.
Student	The student is enrolled on the course Bioinformatics at the UAS Leiden.
Student career supervisor	Teacher at UAS Leiden who provides guidance to students during his/her course and approves the graduation assignment.
Workplace supervisor	The student supervisor at the company or institution where the student completes his/her graduation assignment.

2   Requirements to be able to graduate

To be able to start the graduation assignment, the student must have passed the propaedeutic exam (first year) and 170 EC of the course (see also EER).

Additionally, the student is required to have discussed the study plan with the student career supervisor, and the graduation assignment and the graduation placement must have been approved by the student career supervisor and a second teacher.

In the case of an international graduation assignment, the assignment can only be definitively approved when the student has met the following requirements (extra requirements, requirements stated above remain necessary):

- Authorisation from the department
- Completion of 'Registration form international placement or study'
- Attendance health and safety information session

More information on international graduation and the necessary form scan be found on the DLE. Contact the international coordinator.

A student who meets the requirements detailed above can commence a graduation placement at any time during the academic year. Only during the period from week 5 of period 4 up to and including period 5 is it not allowed to start a graduation placement.

3   Graduation assignment and graduation placement

3.1   Application procedure

- The student looks for a graduation placement. He can approach placement providers or make use of the graduation assignments on offer which are published on the DLE in the teaching group "Study guide bioinformatics" under "placements and graduation".
- The student formulates, after consultation with the workplace supervisor, his individual assignment and registers this in the graduation placement application form (bafstu_aanvraag.docx). If the student commences graduation in period 1 then the completed graduation placement application form must be submitted **before 1 June** (of the previous academic year) to the student career supervisor. If the student commences graduation in periods 2, 3 or 4 then the graduation placement application form must be submitted to the student career supervisor no later than 6 working weeks before graduation commences.
- The student career supervisor consults with the second teacher about the graduation assignment.
- When the graduation assignment is approved by both teachers, the graduation assignment is passed on to the graduation coordinator. The graduation coordinator assigns a graduation teacher. If the assignment is not approved, the student career supervisor makes it apparent to the student that the assignment needs to be adjusted or that a new assignment must be found.
- The future workplace supervisor and the student are updated by the graduation coordinator by email about the approval of the graduation assignment. The moment at which the student can actually commence his graduation depends on whether the student has met the requirements as stated in paragraph 2.

3.2   Requirements graduation assignment

The substance of the graduation assignment must meet the following requirements:
- Individual assignment
  The student must show that he is able to function independently as a bioinformatician. Hence the student must complete an individual assignment. In the situation whereby more than one student is conducting graduation assignments at the same workplace at the same time, the parameters of the assignments must be clearly defined. In addition, the students will be assigned different graduation teachers to enable individual assessments.
- Biology component and informatics component
  The graduation assignment must contain a biology component (minimum of 10%) as well as an informatics component (minimum of 10%). This means that when an application is created during the graduation assignment, this application will also be tested with biological data. This has to be connected to answering a biological

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research question. It follows that, vice versa, if the graduation assignment is primarily concerned with analysing biological data, scripts must also be written to be used in this analysis. Both the biological component and the informatics component must be traceable in the graduation report.

- **(Biological) data**
  Potential (biological) data that the student needs to carry out his assignment must be available at the beginning of the graduation placement.

- **Theoretical framework**
  The graduation assignment must be imbedded in a (academic) theoretical framework. The student must show in the graduation report to have read sufficient relevant academic literature, at least 10 articles.
- **Feasible within timescale**
- **Head-tail**
  The graduation assignment must have a "head" and a "tail". Multiple assignments during the graduation are permitted as long as these can be completed.
- **Vocational university (HBO) standard**
  The student must complete the graduation assignment at the standard of the Bioinformatics bachelor degree as described in annex I and paragraph 5. These competences are based on the competences as described for a bachelor of Applied Science.
- **Appropriate within the student's study trajectory**
  The graduation assignment must fit within the student's chosen study trajectory. The student must take responsibility for this. Assessment is provided by the student career supervisor.
- **Bioinformatics knowledge available**
  Knowledge of bioinformatics must be present at the graduation workplace, or the student must be able to easily approach a bioinformatician beyond the graduation placement organisation so that the student can be substantively supervised.

3.3 Requirements graduation workplace

To ensure that - in the interests of the student, the placement provider and the department - conditions for successful graduation are optimal, there are a number of requirements for the graduation workplace. These requirements are (but not limited to):
- the student has his own workplace which complies to health and safety regulations. The student conducts his activities from this workplace during the graduation;
- a workplace supervisor from within the organisation is entrusted with the supervision (both substantive and organisational) of the student. This workplace supervisor has regular contact with the student and participates in performance reviews;
- the workplace supervisor ensures commitment from the organisation towards the graduation and the graduation assignment;
- the workplace supervisor has at least HBO (vocational university) working and thinking capability;
- this commitment is enshrined in the placement contract. The responsibility for drawing up a contract lies with the student and the placement provider. An example of a placement contract can be found on the DLE in the teaching group "Study guide bioinformatics" under "placements and graduation". Should you wish to use another contract but you have questions then contact the graduation coordinator.

4 Progression and substance of the graduation placement

The graduation assignment forms the conclusion to the course and is essentially an assessment to confirm the competences that a new professional is required to possess. During the graduation assignment the student will perform practical work in response to a clear problem definition.

The graduation assignment will as a rule take place externally at a company, research institute, university or hospital in The Netherlands or internationally. The graduation assignment, including reporting and the graduation sitting, has a duration of 36 to 40 working weeks.

The proposal for the graduation assignment is submitted by the workplace supervisor, however the student develops the assignment himself in a plan of action.

The course of the graduation internship can be found in the document 'Important data <collegejaar.pdf>')

4.1 The progression of the graduation placement

- Week -1 (prior to commencement graduation): Return day 1 (*start meeting and intervision*)
- As soon as the student begins his graduation he notifies his graduation teacher.
- In week 4 of the graduation period the Plan of Action (PVA) is submitted to the graduation teacher.
- In week 5 or 6 the first visit to the placement takes place by the graduation teacher. During this first placement visit the PvA will be discussed as well as confirmation of the dates for subsequent placement visits.
- In weeks 16 to and including 19 an intermediate assessment takes place during the second placement visit. The graduation teacher, together with the workplace supervisor, will complete the intermediate assessment form (bafstu_tussentijdse_beoordeling.docx). The intermediate assessment will subsequently be immediately discussed with the student. For more information on the intermediate assessment, see paragraph 5.1.1.
- In week 25 the student submits a written intermediate report to the graduation teacher. See paragraph 4.2.5 for details.
- In weeks 27-29 the third placement visit takes place. During this third placement visit the written intermediate report is discussed amongst other matters. Furthermore, using the earlier intermediate assessment, it will be determined whether the student has improved
- In week 35 the student submits a digital version of the final graduation report via Gradework.
- The graduation coordinator appoints a second examiner (examiner 2).
- The graduation teacher (= examiner 1) and examiner 2 issue the final Go / No go decision for the graduation sitting based on the submitted reports. Appeals against this decision can be made to the graduation coordinator and subsequently to the examination board of the department.
- In weeks 38 to and including 42 the graduation sitting takes place at UAS Leiden. The student gives a presentation and answers questions about the completed graduation assignment. The workplace supervisor attends the presentation.

A number of 'return days' are also planned during the graduation. At return days, all students engaged in graduation placements (except those at international graduations) return to UAS Leiden where a variety of activities take place. In the document belangrijke_data.pdf an overview of dates for the return days and for the activities is provided.

4.2 Substance of the graduation placement

The components of the graduation placement are:

1. Plan of action
2. Practical work
3. Orientation day
4. Placement presentation (at college, for students during return day 3)
5. Written intermediate report
6. Intermediate report at graduation workplace
7. Poster presentation (at college during return day 4)
8. Final presentation at graduation workplace
9. Graduation report
10. Graduation presentation and defence of the graduation report

4.2.1 Plan of Action

No later than 4 weeks after the graduation has commenced the Plan of Action (PvA) (following approval by the workplace supervisor) must be submitted via Gradework. Immediately after digitally submitting the PvA the student informs the graduation teacher of this by email. The PvA is marked either with a pass (P) or a fail (F). A pass for the PvA is a necessary requirement to pass the teaching component bafstu. If the PvA is marked as a fail then it must be improved upon (by way of a re-take) before the student can substantively continue with the graduation assignment. The PvA can be written in Dutch or English. Before the PvA is submitted it must be approved by the workplace supervisor.

The PvA includes the following components:

- a) Title and title page
- b) Introduction
- c) Objective/research question
- d) Products
- e) Flowchart
- f) Planning
- g) Risk assessment
- h) Project parameters
- i) Supervision
- j) References

Size: circa 10 pages (A4)

Ad a)   The title as it is likely to appear on the final graduation report with the addition of "Plan of Action". The title page must include your name, the date, the draft number, UAS Leiden and the course Bioinformatics, the period in which you will complete your graduation assignment, the details of the placement workplace where you complete your graduation assignment, the name of the workplace supervisor (with title) and the name of your graduation teacher (with title).

Ad b)   Includes the objective or the hypothesis of the graduation assignment plus all the background information the reader needs to understand the assignment. This is a substantive piece of text in which the *what, why* and *how* are described and for which you must be properly read-up. The *what* concerns a clarification of the title; with the *why* it is important to place the research in a broader framework (indicate the public interest and give a description of the background); the *how* should detail in short what you are going to do. Don't transcribe from the "commissioning client" but use your own words. This piece should form the bulk of the introduction of the graduation report. Sources are referred to according to the AMA rules.

Ad c)   Here, the objective of the graduation assignment is repeated briefly and concisely.

Ad d)   Herein is described which products are exactly going to be delivered.

Ad e)   The flowchart provides an overview of the research project and, where necessary, of the to be developed software.

Ad f)   Overall time planning in weeks. Make a list of everything you need to carry out to ensure the successful completion of your graduation assignment. For example: Literature research, write programme X that can do Y, write a report, etc. This is set out in a schedule in weeks according to when the graduation takes place. If participation in exams or teaching for other modules coincides with the graduation this must be incorporated into the planning.

Ad g)   Herein are described which risks are apparent during the graduation. For each risk, an assessment must be made of the likelihood that certain scenarios occur and how these might impact the progress of the project. Ways to avoid or mitigate each risk will be discussed beforehand.

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Ad h)   Herein the student states what the parameters of the graduation assignment shall be. In other words: what the student shall *not* do. This is to avoid ambiguity in arrangements with the commissioning client.

Ad i)   Herein the type and scope of the supervision is described.

Ad j)   Provide an overview of the literature which you have used to write the PvA. Make sure you also reference literature you have used in the correct place in the PvA text. Use the AMA rules.

4.2.2 Realisation of the graduation assignment

The graduation placement offers the student the opportunity to, whilst completing a bioinformatics assignment, gain learning and practical experience in a representative working environment. The student is also introduced to the specific activities, organisational structure and culture of a particular organisation. This experience can contribute towards choosing a professional career later on. Skills such as working independently, communication, cooperation, taking initiative, planning and presentation are important and can be practised during the graduation.
A project-based approach is central to carrying out the graduation assignment. In addition, attention is given to evaluation, feedback and adjusting the Plan of Action (where necessary). The graduation assignment is carried out under the responsibility of the workplace supervisor. Completing the graduation assignment is one of the three components on which the student is assessed (see document bafstu_uitvoering.pdf).

4.2.3 Guided tour and accompaniment orientation day

It is important to introduce students to potential future placement workplaces at an early stage. Within the bslb02 programme, second year students must participate in an orientation day. The orientation days take place in period 3. The duration of the orientation day is one half day (morning or afternoon). The appointments can only be confirmed once the timetable for the third period is published.
Accompanying these second year students will be the graduation student, obviously after getting permission from the head of the placement workplace or the workplace supervisor.
To enable the second year students to make an informed choice at which graduation they wish to spend a half day orientation, the graduation students will pass on information about their graduation assignment and placement during the return day 2. For this they prepare an A4 with personal details and details about their placement (see annex II). These A4 papers are handed out on return day 2. The second year students are expected to choose one of the placements during return day 2.

What action is the graduation student expected to undertake?
Firstly, he must ask the workplace supervisor if he agrees to the visit of 2-5 second year students during the orientation day.
If second year students have chosen 'your' placement workplace, then it is expected that they "shadow" you. This means: they are able to observe you and you explain to them what you are doing. Perhaps you could organise a guided tour of the company/institution. This way you are of no extra burden to your workplace supervisor and for you it is instructive and fun ti be able to pass on the things that you have learnt.
Possible activities during the orientation day:
- Presentation by graduate student
- Attend work meeting/presentation
- Guided tour of the company/institution
- Working on a short assignment which is related to the graduation assignment (ensure students bring laptops)

4.2.4 Placement presentation

During the return day 3, the student gives a presentation to second and third year bioinformatics students about the graduation placement. Attention should be given to the company/institution/department where the placement takes place. The objective of the graduation assignment and the approach to be taken is discussed during the presentation. Furthermore, attention is given to the results obtained up to that point and what needs to be done in the remainder of the graduation placement.

4.2.5 Intermediate written report

The student hands in an intermediate written report in week 25. Submission of the report is to the graduation teacher via email. This intermediate written report includes at least the (final) introduction, materials and methods, first results and a part of the discussion of the final graduation report. The intermediate written report can be written in Dutch or English. The intention is however that the intermediate written report and the final graduation report are written in the same language.

The workplace supervisor must approve the intermediate written report prior to submission.

4.2.6 Intermediate presentation at graduation workplace

During the graduation placement the student gives at least one intermediate presentation to his colleagues at the placement workplace. In this presentation, the objective of the graduation assignment and the approach to be taken is discussed. Furthermore, attention is given to the results obtained up to that point and what needs to be done in the remainder of the graduation placement. This intermediate presentation is planned by the workplace supervisor.

4.2.7 Poster presentation

The student makes a poster about his/her placement and presents this on return day 4 to first year bioinformatics students, teachers and workplace supervisors. The poster is also digitally submitted to the graduation coordinator. The poster can be either in Dutch or English. The poster should conform in terms of content and layout to requirements customary to posters which are presented at academic meetings (A0 or A1 size). The workplace supervisor must approve the poster before it is submitted and presented. The poster presentation concludes with the awarding of the poster prize for the best poster(s).

4.2.8 Final presentation at graduation workplace

The student gives this final presentation of 20-30 minutes to colleagues at the graduation workplace in which he explains about the work that is described in the graduation report. This presentation can be (largely) the same as the graduation presentation that the student will give during the graduation sitting. The final presentation at the graduation workplace must have taken place before the graduation presentation takes place.

4.2.9 Graduation report

The graduation report is one of the three components on which the student is assessed. The graduation report can be written in Dutch or English.

The graduation report is a comprehensive essay for which the guidelines have been compiled in annex III. The writing of the report actually starts with the plan of action in which the objective of the project and the analysis of the problem (with literature references) are described.

When the structure of the report has more or less been determined, work can commence during the graduation placement with, for example, the writing of the experimental section (Materials and Methods and Results). The written pieces must be submitted to the workplace supervisor.

In week 35 a digital version of the graduation report must be handed in via Gradework. Submission of possible annexes is also done via Gradework. The precise deadline for handing in the documents mentioned above is stated in the document bafstu_belangrijke_data.pdf.
If the graduation report is not submitted by the established deadline in week 35, the module bafstu will be marked with a "fail" (F).

The guideline for writing the graduation report is that the workplace supervisor gives feedback about the whole report no more than twice. The graduate report can only be submitted once it has been approved by the workplace supervisor.

An extension for handing in the graduation report can be applied for via email from the graduation teacher and the graduation coordinator. If you wish to postpone the submission of the graduation report, this must be applied for no later than one week before the established report deadline. An extension can be granted for up to two months after the conclusion of the graduation placement.
If the graduation report has not been submitted within 2 months after the conclusion of the graduation placement, the module bafstu will be marked with a "fail" (F).

The report has the structure of an academic article, as follows:
1) Title page
2) Abstract (this **must be written in English!**);
3) Introduction (with objective/research question);
4) Materials en Methods;
5) Results;
6) Conclusion & Discussion;
7) References.

Annex III contains an extensive description of the requirements that the report must meet.
If desired by the student and the workplace supervisor, the report may be written in English. Just as with a report written in Dutch, it must be grammatically correct.
Annexes can be added to the report. However, the report must be readable without having to continuously refer to the annexes.
The document bafstu_verslag.pdf gives a detailed account of how the report is assessed. In response to the graduation report, the graduation teacher and examiner 2 give either a "Go" or "No-Go" for the graduation sitting.
In the case of a "Go", this means that the report has been assessed as a pass or that the report is a fail but can be easily improved to a pass by some simple adjustments. In both cases the provisionally planned graduation sitting can go ahead.
In the case of a "No-Go", this means that the report has been assessed as a fail. The consequence of a "No-Go" is that the provisionally planned graduation sitting cannot go ahead and a new date must be planned for the graduation sitting. If the report is assessed as a fail, the student is given one opportunity to improve the report and to re-submit it. The date for re-submitting the graduation report is established in consultation with the graduation teacher and the workplace supervisor.

4.2.10 Graduation presentation and defence of the graduation report

The graduation presentation is one of the three components on which the student is assessed (see document bafstu_verdediging.pdf).

During the graduation sitting the student gives a presentation of between 20 and no more than 30 minutes in which he explains the work that is described in the graduation report. The maximum presentation duration of 30 minutes is strictly enforced. Any part of the presentation beyond the 30 minute cut off point will not count towards the assessment of the presentation. This presentation can be given in Dutch or English. Following on from the presentation, the student will spend approximately 20 minutes answering questions from the workplace supervisor, examiner 1, examiner 2 and potentially from external experts about the presentation and the graduation report. The external expert could, for example, be someone from the bioinformatics department examination board or a bioinformatics teacher from another applied sciences university. The external expert will provide feedback on the graduation sitting procedure, the standard of graduation and the assessment of the graduation. This information is used by the bioinformatics department to, where necessary, improve areas with a view to future accreditation of the course.

The external expert is not an examiner and therefore does not influence the grade given for the graduation sitting and/or the report. This grade is determined by the two examiners (teachers from the department) and an additional advisory role of the workplace supervisor.

5 Assessment of bafstu

5.1.1 Intermediate assessment

An intermediate assessment of the bafstu module takes place in the weeks 16 to and including 19. Examiner 1, in consultation with the workplace supervisor, completes the form for the intermediate assessment (bafstu_tussentijdse_beoordeling.docx). During the intermediate assessment the practical work (completion of the graduation assignment) is assessed. If the result of the intermediate assessment is a fail (< 5.5) the consequence is that the graduation placement must be extended by four months. During the remaining, extended graduation period the student will have to improve the realisation of the graduation assignment to a pass to be able to conclude the bafstu module with a pass. Extension of the graduation period is only possible in consultation with and following the approval of the workplace supervisor.

5.1.2 Final assessment

The final assessment of bafstu consists of the three following components:

1. Completion of the graduation assignment;
2. Graduation report;
3. Graduation defence

The final grade for bafstu is rounded to half points. The course credit "graduation (bafstu)" is obtained when a pass grade (at least 5.5) is achieved for each of the three components listed above. If one or more of the components is marked with a fail (grade < 5.5) a fail (F) will be registered for bafstu in Osiris. A detailed overview of the assessment criteria is presented in the documents bafstu_uitvoering.pdf; bafstu_verslag.pdf and bafstu_verdedging.pdf

6 Re-take

If, during the final assessment, a component is assessed as a fail (grade < 5.5) the student has the right to re-take (= the second opportunity) each component once. If during the second opportunity one or more components is still assessed as a fail (grade < 5.5), the student must repeat the entire graduation period at a different location (read: different graduation placement).

7 Supervisor tasks

For the duration of the graduation year the student has two supervisors: the graduation teacher from the college and the workplace supervisor at the company or institution at which the student completes his graduation assignment. This paragraph describes the tasks of the different supervisors. At the end of the graduation year the workplace supervisor will be asked to complete a questionnaire to evaluate the content and the standard of the course.

7.1 Tasks of the workplace supervisor

As a rule, per student, there is one person who acts as a point of contact and as the supervisor responsible for the graduation placement. In addition to supervising the student, the workplace supervisor is in regular contact with the graduation teacher regarding the functioning of the student. For the final assessment, consultation takes place between the workplace supervisor and both examiners. Herein the workplace supervisor has an advisory role. The workplace supervisor needs to have substantive expertise which means at least a higher education level of thinking and working.

General tasks and areas of attention for the workplace supervisor
- Potential interns receive information about the company/institution and the graduation assignment;
- Makes arrangements about the start of the graduation placement;
- Maintains communication between the authorised department at the company/institution regarding formal issues such as the placement contract (this is primarily a matter between the placement provider and the student); acts as intermediary between the company/institution concerned and the student;
- Examines the structure and content of the brochure "The Graduation Year" for the course Bioinformatics;
- Introduces the student at the company/institution, familiarises the student and goes through the rules;
- Ensures that the student adheres to the safety and other regulations at the placement workplace;
- Supervises and supports the student in the completion of the graduation assignment and with searching for information (with decreasing intensity so that over time, the student can work independently); the student may work no more than one day per week from home;
- Gives the student the opportunity to maintain contact with the UAS Leiden (amongst others via the return days) and in particular with the graduation teacher;
- Informs the student about the (intermediate) performance review; where necessary suggesting points of improvement. In case of problems, contact the graduation teacher;
- Discusses progress with the graduation teacher, including the student's performance. Potentially makes agreements about the confidentiality of reports;
- Provides the student with the necessary information to start with and supervise the writing of a Plan of Action. The Plan of Action must be approved by the workplace supervisor before it can be submitted;
- Plans the student's intermediate presentation and final presentation to colleague researchers at the graduation workplace;

- In consultation with the student and the graduation teacher makes agreements early on about the general structure and format of the graduation report;
- Allows the student the opportunity to write a report and support the student herein. Supervises the student in improving or adding to the report (if necessary). The guideline for this is that the student receives feedback no more than twice regarding the graduation report. Reports that are submitted by the student to the college first have to be approved by the workplace supervisor;
- Participates in the graduation sitting and advises and provides the information to the two examiners need to be able to make an assessment of the graduation (see documents bafstu_verdediging.pdf and bafstu_uitvoering.pdf);
- Supervises the student in making a poster. The poster must be approved by the workplace supervisor before it can be submitted to the college;
- Attendance at the poster presentation is highly appreciated by the bioinformatics department.

Table 2: Chronological overview of the workplace supervisor's activities

week	what	tasks
1	commencement graduation	
2-6	• graduation teacher visits placement workplace (if graduation takes place in The Netherlands) • graduation teacher calls workplace supervisor and student (if graduation takes place outside of The Netherlands)	Discussion (Preliminary) discussion PvA
4	Student sends Plan of Action to graduation teacher	support student in drawing up Plan of Action Approve PvA
16-19	• graduation teacher visits placement workplace (if graduation takes place in The Netherlands). • graduation teacher calls workplace supervisor and student (if graduation takes place outside of The Netherlands)	complete the intermediate assessment form together with the graduation teacher
25	Student hands in intermediate written report	support student in drawing up the intermediate report
27-29	• graduation teacher visits placement workplace (if graduation takes place in The Netherlands) • graduation teacher calls workplace supervisor and student (if graduation takes place outside of The Netherlands)	discuss the intermediate written report
35	Student hands in graduation report	assist student with writing of the report. Approval of the report.
38-42	Graduation sitting	attend graduation sitting at UAS Leiden

7.2 Tasks of the graduation teacher

- Visits student at the graduation workplace at least three times;
- Discusses the progress of the graduation placement and indicates when certain actions by concerned parties are required. The graduation teacher also conveys a clear picture of what is expected of the workplace supervisor. This brochure serves as a starting point;

- Maintains contact with the workplace supervisor and the student through placement visits, return days, email and telephone;
- An important task of the graduation teacher is to consider whether the student is comfortable in his new situation and if the graduation assignment is suited to the particular student. Where problems arise he seeks solutions, in consultation with the student and the workplace supervisor;
- Is the direct point of contact for all manner of issues during the graduation research phase;
- During the writing of the report the graduation teacher can ask to see certain parts before these are passed on to the supervisor for assessment. The graduation teacher can hereby determine whether the report is written according to the guidelines for the course Bioinformatics. In addition, it is important that the graduation teacher monitors whether the student keeps to his own time schedule;
- Functions as first examiner and together with the second examiner is responsible for the assessment attributed to the graduation. The graduation teacher is in charge of the grading administration (the grades must be submitted to Osiris by the graduation teacher himself);
- During the return days the graduation teacher holds an intervision meeting with students who are graduating;
- The graduation teacher attends the poster presentation;
- Through his contacts in the occupational field, it is expected of the graduation teacher that he introduces relevant new knowledge to the department. Furthermore, he maintains contact with the workplace supervisor so that this workplace supervisor remains part of his network;
- The graduation teacher also monitors whether theses are eligible to be nominated for prizes and notifies the examination board of this.

8   Miscellaneous items regarding the graduation placement

- Working times and time off during the graduation placement are determined by the placement providing company/institution. Academic holidays are not relevant. If an intern is ill, it is up to them to make arrangements with the graduation teacher and the workplace supervisor to catch up the missed time;

- During the graduation period there are return activities at the college (see document bafstu_belangrijke_data.pdf): the student must participate in these return activities;

- A placement contract must be signed for each graduation placement. The responsibility for drawing up a contract lies with the student and the placement provider. An example of a placement contract can be found on the DLE in the teaching group "Study guide bioinformatics" under "placements and graduation". Should you wish to use another contract but you have questions then contact the graduation coordinator;

- It is commonplace that a student may deal with confidential data during their graduation assignment. Arrangements needs to be made concerning this between UAS Leiden and the placement provider beforehand. Usually, a 'confidentiality agreement' is signed by the graduation teacher;

- Some placement providing institutions will only take an intern after they have undergone a medical examination. This examination is organised and budgeted for by the placement provider.

9 Issue of diploma (degree) and application for graduation ceremony

There are two graduation ceremonies per academic year: one in March and one in August. If you have started bafstu in this academic year in September, then only the later date applies.

<u>To participate in the graduation ceremony your grade list must be complete some time in advance and all assessments confirmed.</u>

Therefore, check your grades list as soon as possible for problems which are set out in paragraph 9.1 and discuss any questions you might have about this with your mentor. If there is a mistake, be aware of the deadline for grade corrections. These can be found in the document "bafstu_belangrijke_data.pdf".

9.1 What to do if there is a mistake in your grades list

It is possible that there may be issues with your grades list. Below are some frequent problems and the solutions.

Problem: There are still conceptual grades on my list.
Solution: Contact the teacher who submitted the grades and ask them to change them to actual grades.

Problem: Grades which I have achieved are not yet visible on my study progress overview.
Solution: Contact the teacher who gave the module, ask them to submit the grade and to make it an actual grade.

Problem: I passed part of a module in one year and another part in another year. Now there are two module codes for this module on my list but no credits.
Solution: Send an amendment request to the examination board Science & Technology via https://examencommissie.hsleiden.nl/eis.html, in which you show which module(s) and exams it concerns. Be aware of the ultimate deadline for this, found in the document "bafstu_belangrijke_data.pdf".

Problem: I passed a module in a later year than intended and now it has been added to the bottom of my list under the heading 'miscellaneous'.
Solution: Send an amendment request to the examination board Science & Technology via https://examencommissie.hsleiden.nl/eis.html, in which you show which module(s) it concerns. Be aware of the ultimate deadline for this, found in the document "bafstu_belangrijke_data.pdf".

Problem: I selected an individual choice minor ('free minor') which is compiled from different module from the course Bioinformatics, possibly with modules from a different course. These modules are not grouped in one component or they are grouped in one component but the credits are not (completely) assigned to my grades list.

Solution: Send an amendment request to the examination board Science & Technology via https://examencommissie.hsleiden.nl/eis.html, in which you show which module(s) it concerns. Be aware of the ultimate deadline for this, found in the document "bafstu_belangrijke_data.pdf".

9.2   Interim diploma request

If you do not wish to receive your diploma at the graduation ceremony, this is possible. Once per month (1st of the month) Student Affairs checks whether there are students who meet all the requirements to receive a diploma. Those students receive an automatic notification.

If there are issues with your grades list then you must indicate this yourself. Check the list in paragraph 9.1. If you need to notify the examination board that your grades list requires adjustment, do this 4 weeks before the 1st of the month in which you want to receive your diploma at the latest via https://examencommissie.hsleiden.nl/eis.html.

9.3   Proof of graduation for enrolment master's degree

If you wish to start a master's degree in the academic year after obtaining your diploma you will need to prove you have achieved a BSc to enrol. If you have not yet received or collected your diploma but it is visible in Osiris that you have passed, you can request the examination board Science & Technology via https://examencommissie.hsleiden.nl/eis.html to provide a signed statement of graduation. You will, at a future point, have to submit your diploma to the master's course.

10 Offering new graduation assignments

If you wish to offer a graduation assignment you can send your name, email address and a few key words regarding your research to pijpe.j@hsleiden.nl. Your details will be added to the list of candidate placement and graduation assignment providers. If a student is interested in graduating at your workplace, we will contact you.

For questions you can contact the graduation teacher or the graduation coordinator Jeroen Pijpe pijpe.j@hsleiden.nl.

Annex I: Competences Bachelor of Applied Science

The course Bioinformatics at the UAS Leiden falls under the Bachelor of Science. The competences for the domain Applied Science are formulated based on the existing national vocational and qualification profiles.
In 2008 the Domain Applied Science, in consultation with the national professional field, drafted a joint competence-oriented profile description of a Bachelor of Science. In this competence profile the competences and competence indicators are described for a professional with five years' working experience after graduating from one of the courses that issue a Bachelor of Science diploma.
This profile description was revised in a number of areas and republished in 2010. This document, containing an elaboration of the intermediate levels of the domain competences, represents an addition to the 2008 defined competences and competence profiles. The aim is to provide insight for the professional field into the possible standards structure within the courses. This formulation came about at the end of 2010 / beginning of 2011 following an exchange and a comparison between formulations from different applied science universities.

The impact of this per course can vary between different applied science universities, based on their own profiling of the courses and the application of competences within the course, as they are formulated in their own course policy and course competency profiles.

The profile of the Domain Applied Science (DAS) covers eight competences, of which seven are applicable to a bioinformatician. The seven competences identified by DAS are described below, together with the associated competences.
The course has a major/minor structure whereby the major (main part) phase of 210 EC consists of a propaedeutics (preparatory) phase of 60 EC and a post-propaedeutics phase of 150 EC. The minor (the choice part) comprises a maximum of 30 EC and is a component of the propaedeutics phase. The qualifications of the bioinformatician are described in competences with their associated operational indicators at different levels. The operational indicators that belong to the competences are described without context.
The course profile of Bioinformatics is derived from the competency-oriented profile description of the Bachelor of Science. This was reviewed in 2007 by the professional field and published in2008[1]. In 2016 an improved, 2.0 version was published[2].

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[1] Bachelor of Applied Science-Een competentiegerichte profielbeschrijving, Domein Applied Science, december 2008.
[2] Bachelor of Science in het Domein Applied Science -Een competentiegerichte profielbeschrijving, versie 2.0, Domein Applied Science, september 2016.

1. Competentie Onderzoeken

De Bachelor of Science doet binnen het domein Applied Science onderzoek dat ofwel bijdraagt aan de oplossing van een probleem, of de ontwikkeling van een methode, ofwel leidt tot groter inzicht in een onderwerp binnen de eigen werkomgeving.

	Niveau I	Niveau II	Niveau III	Niveau IV
	De student voert een eenvoudig onderzoek uit n.a.v. een aangereikte vraagstelling.	De student vertaalt een aangereikt probleem in concrete vraagstellingen, kiest onder begeleiding een onderzoeksstrategie en voert het onderzoek ui	De student vertaalt een probleem naar een onderzoeksstrategie en voert het onderzoek uit.	Ervaren beroepsbeoefenaar (zie beschrijving competentie hierboven).
	Hij laat dat zien door:	Hij laat dat zien door:	Hij laat dat zien door:	Hij laat dat zien door:
A	Inhoudelijk met de opdrachtgever over de opdracht te communiceren (bv. interne of externe opdrachtgever); een gegeven casus te analyseren, een onderzoeksvraag te formuleren en deze op te delen in deelvragen.	Op basis van relevante deelvragen het probleem te analyseren en de gekozen onderzoeksstrategie te verantwoorden.	De gekozen onderzoeksstrategie te verantwoorden.	Over voldoende deskundigheid en initiatief te beschikken om op natuurwetenschappelijk gebied problemen op te sporen en te analyseren.
B	(Zo nodig) in overleg met de opdrachtgever de vraagstelling te verhelderen. In overleg met de opdrachtgever doelstellingen te formuleren vanuit een aangereikte eenvoudige doelstelling.	Deelvragen van het uit te voeren onderzoek te formuleren. In overleg met de opdrachtgever doelstellingen te analyseren en om te zetten in het gewenste onderzoek.	Voorstel(len) te doen over te volgen strategie en uitvoering.	De doelstellingen van een gewenst onderzoek vanuit de vraagstelling op te stellen.
C	Gebruik te maken van aangereikte literatuur om de vraag te verhelderen.	Relevante bronnen te selecteren en te gebruiken om zich verder in de onderzoeksvraag te verdiepen.	Gebruik te maken van relevante criteria om de betrouwbaarheid van bronnen in te schatten.	Zelfstandig (wetenschappelijke) literatuur te selecteren en te verkrijgen om zich verder in het probleem te verdiepen, daarbij de betrouwbaarheid van de verschillende informatiebronnen correct inschattend.
D	Voor de opdracht een werkplan/ plan van aanpak te maken volgens een aangereikt protocol (met doel, opzet, tijdsduur en planning, rekening houdend met veiligheids- en milieuvoorschriften).	Een werkplan te maken, in overleg met opdrachtgever, zelfstandig een aanpak voor uitvoering van het onderzoek te ontwerpen, rekening houdend met veiligheid, kwaliteit, milieu.	Zelfstandig een werkplan te ontwerpen en de daarin verwerkte randvoorwaarden te motiveren.	Een uitvoerbaar en duurzaam werkplan (met budget) te maken, waarbij rekening wordt gehouden met kwaliteitszorg, veiligheid, gezondheid, welzijn, milieu, duurzaamheid en ethiek.
E	Bij uitvoering van de opdracht te werken conform het werkplan/stappenplan.	Bij uitvoering van de opdracht te werken conform werkplan. Het werkplan efficiënt uit te voeren en zo nodig tussentijds aan te passen.	Het werkplan effectief en efficiënt uit te voeren en zo nodig tussentijds aan te passen.	Het werkplan planmatig uit te (laten) voeren door gebruik te maken van relevante methoden, technieken en apparaten.
F	Actief mee te werken in een team.	Te functioneren als volwaardig teamlid in de eigen werkomgeving (d.m.v. reflectie en feedback).	Afhankelijk van het karakter van de opdracht als volwaardig lid te functioneren en samen te werken in een team waarin ook	Resultaatgericht samen te werken in multidisciplinair verband.

			medewerkers uit andere vakgebied(en) zitten.	
G	Het resultaat van de opdracht zo nodig rekenkundig/statistisch te bewerken en samen te vatten, te structureren in het licht van de onderzoeksvraag en overzichtelijk in beeld te brengen.	(Deel)resultaten samen te vatten en te interpreteren in relatie tot de opdracht/ onderzoeksvraag.	(Deel)resultaten logisch en overzichtelijk te combineren en in relatie tot de onderzoeksvraag conclusies te trekken.	De resultaten samen te vatten, te structureren en te interpreteren in relatie tot de onderzoeksvraag.
H	Mondeling en/of schriftelijk volgens aangegeven richtlijnen over de opdracht te rapporteren.	De (deel)resultaten te combineren in één rapportage volgens de geldende richtlijnen/ standaard.	Over het onderzoek te rapporteren volgens de in het werkveld geldende standaard.	Resultaten te rapporteren volgens de in het werkveld geldende standaard.
I	Conclusies te formuleren uit de onderzoeksresultaten en zo nodig een voorstel te doen om uitvoering van de opdracht/ het onderzoek te verbeteren.	Een voorstel tot vervolgstappen te doen op basis van de combinatie van deelresultaten.	Een strategie voor vervolgonderzoek te formuleren; een voorstel tot vervolgstappen te doen op basis van analyse van resultaten.	Op basis van de verkregen resultaten voorstellen te doen voor een vervolg op het onderzoek.

2. Competentie experimenteren

De Bachelor of Science voert experimenten uit binnen het domein Applied Science zodat aantoonbaar betrouwbare resultaten worden verkregen.

	Niveau I	Niveau II	Niveau III	Niveau IV
	De student voert een experiment uit volgens voorschrift.	De student kiest een geschikt voorschrift, past dit zo nodig aan en voert het uit.	De student zet met begeleiding experimenten op en voert deze zelfstandig en systematisch uit.	Ervaren beroepsbeoefenaar (zie beschrijving competentie hierboven).
	Hij laat dat zien door:	Hij laat dat zien door:	Hij laat dat zien door:	Hij laat dat zien door:
A	Desgevraagd uit te leggen wat de bedoeling van het experiment is.	Een voorschrift te kiezen en uit te leggen waarom het geschikt is voor het experiment.	Een globaal beschreven procedure of vooropgezet synthesedoel om te zetten naar (een) werkvoorschrift(en) en meerdere methoden te combineren tot een proefopzet.	Een onderzoeksvraag te vertalen naar een adequate experimentele opzet inclusief werkvoorschriften.
B	Desgevraagd het principe van de gebruikte methode uit te leggen.	Beschikbare methoden en voorschriften op geschiktheid te beoordelen en experimentele problemen op te lossen (troublesshooting).	Methoden en technieken te kiezen en te anticiperen op mogelijke experimentele problemen.	Zodanige kennis, inzicht en vaardigheid te tonen dat werkzaamheden op een verantwoorde, veilige en kritische wijze kunnen worden uitgevoerd met de juiste methoden, technieken en apparatuur.
C	Apparatuur volgens voorschrift te bedienen.	Beschikbare apparatuur op geschiktheid te beoordelen en zo nodig instellingen aan te passen.	Bij opzet en uitvoering van experimenten rekening te houden met mogelijkheden en beperkingen van de te gebruiken apparatuur.	Zich zelfstandig verder te verdiepen in methodieken en achtergronden (waaronder mogelijkheden en beperkingen van de apparatuur).
D	Op basis van een voorschrift een experiment adequaat voor te bereiden, uit te	Een werkplanning te maken voor uitvoering van een voorschrift, dit te beoordelen op	Een planning te maken voor een aantal experimenten, deze uit te voeren en binnen de	Werkvoorschriften nauwgezet te volgen en zo nodig bij te stellen, zodat aantoonbaar

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	voeren en binnen de gestelde tijd resultaten te verkrijgen in overeenstemming met de veiligheids- en milieuvoorschriften.	veiligheids- en milieuaspecten en uit te voeren, en binnen de gestelde tijd reproduceerbare resultaten te verkrijgen.	gestelde tijd reproduceerbare resultaten te verkrijgen.	betrouwbare en reproduceerbare resultaten worden verkregen.
E	Een voorschrift uit te voeren volgens de veiligheidsvoorschriften.	De milieu- en veiligheidsaspecten van een voorschrift te beoordelen.	Bij de proefopzet rekening te houden met milieu- en veiligheids- aspecten en hierover met zijn omgeving te communiceren.	Rekening te houden met veiligheid, gezondheid, milieu en hygiëne en de experimenten zo duurzaam mogelijk uit te voeren.
F	Meetresultaten adequaat en correct te bewerken en in te schatten of een gevonden uitkomst realistisch is.	De betrouwbaarheid van een resultaat te beoordelen op basis van statistische overwegingen.	Een (statistische) methode te kiezen om de betrouwbaarheid van het gevonden resultaat te beoordelen.	(Statistische) technieken toe te passen om de resultaten te verwerken/valideren en de kwaliteit ervan te borgen.
G	Een nauwkeurig en overzichtelijk labjournaal bij te houden.	Een nauwkeurig en overzichtelijk labjournaal bij te houden en adequate conclusies uit de experimentele resultaten in de rapportage op te nemen.	Een nauwkeurig en overzichtelijk labjournaal bij te houden met adequate conclusies en in de rapportage de betrouwbaarheid van de gevonden resultaten te verantwoorden.	Resultaten te rapporteren volgens de in het werkveld geldende standaard.
H	Zo nodig een voorstel te doen om uitvoering van een voorschrift te verbeteren.	Voorstellen te doen tot verbetering van het voorschrift.	Voorstellen te doen tot verbetering van het voorschrift en zo nodig methoden voor te stellen voor vervolgexperimenten.	Op basis van de onderzoeksresultaten voorstellen te doen voor vervolgexperimenten.
I	Een planning te maken voor het werk dat op een practicumdag (deel) gedaan moet worden, teneinde dit efficiënt uit te kunnen voeren.	Een planning te maken voor het uitvoeren van experimenteel werk binnen een afgebakend project dat qua tijdsduur van beperkte omvang is (enkele weken).	Een planning te maken voor de opzet en uitvoering van experimenteel werk binnen een project van langere duur (minimaal een half jaar, zoals bij de afstudeeropdracht), waarbij regelmatige aanpassing van de planning op basis van de voortgang vereist is.	Snel en efficiënt het beoogde doel te bereiken door middel van het toepassen van projectplanning.

Waar 'apparatuur' staat, kan voor een bio-informaticus 'software/ computer/ besturingsplatform' worden gelezen; waar 'experiment' staat, kan voor een bio-informaticus vaak 'analyse' worden ingevuld. Waar 'labjournaal' staat, geldt voor een bio-informaticus 'logboek'.

3. Competentie ontwikkelen
NVT.

4. Competentie beheren | coördineren

De Bachelor of Science ontwikkelt, implementeert en onderhoudt een beheersysteem of onderdelen daarvan, zodat het systeem voldoet aan de betreffende wet- en regelgeving, kwaliteitsnormen en de normen en waarden van de organisatie.

	Niveau I	Niveau II	Niveau III	Niveau IV
	De student toetst het werk aan de eisen van verschillende beheersystemen.	De student levert een bijdrage aan één of meer beheersystemen binnen de organisatie.	De student implementeert en onderhoudt een beheersysteem.	Ervaren beroepsbeoefenaar (zie beschrijving competentie hierboven).
	Hij laat dat zien door:	Hij laat dat zien door:	Hij laat dat zien door:	Hij laat dat zien door:
A	Een (eventueel) probleem bij uitvoering	Voorstellen te doen ter oplossing van	Mogelijke problemen te voorzien bij uitvoering	Eventuele problemen met betrekking tot de

	van een beheersysteem op te merken en te benoemen.	voorkomende problemen bij uitvoering en onderhoud van een beheersysteem.	en onderhoud van een beheersysteem.	ontwikkeling, uitvoering en onderhoud van een (data)beheersysteem te analyseren.
B	Mogelijkheden tot verbetering van de uitvoering van een beheersysteem te inventariseren.	Voorstellen te doen ter verbetering van een beheersysteem.	Een verbeterplan voor een beheersysteem op te stellen en uit te (laten) voeren.	Een verbeterplan op te stellen, uit te voeren en te evalueren waarmee de problemen creatief, gestructureerd economisch verantwoord kunnen worden opgelost.
C	Er blijk van te geven op de hoogte te zijn van relevante wet- en regelgeving.	Elementen van wet- en regelgeving te vertalen in aanpassing van een beheersysteem.	Nieuwe wet- en regelgeving of maatschappelijk gewenste ontwikkelingen te verwerken in een bestaand beheersysteem.	Rekening te houden met wet- en regelgeving en (internationaal) geldende normen en waarden, met name met betrekking tot duurzaamheid en betrouwbaarheid.
D	De uitvoering van zijn werkzaamheden in te passen in de op zijn werkplek gehanteerde beheersystemen.	Naleving van de richtlijnen van algemeen geldende beheersystemen te controleren.	De op zijn werkplek gehanteerde beheersystemen te onderhouden (verbeteren) en desgewenst een nieuw systeem te implementeren.	Activiteiten te coördineren met betrekking tot de ontwikkeling, implementatie en het onderhouden van het (data)beheersysteem (of onderdelen daarvan).
E	Te rapporteren over (de naleving van de richtlijnen) van de gehanteerde beheersystemen bij uitvoering van zijn werkzaamheden.	Te rapporteren over uitvoering van één of meer beheersystemen op zijn werkplek.	Te rapporteren over en presenteren van veranderingen in één of meer beheersystemen.	Informatie te rapporteren en presenteren volgens de in het werkveld geldende standaard.
F	Medewerkers desgevraagd informatie te verschaffen over uitvoering van de gehanteerde beheersystemen.	Medewerkers adequaat te informeren over de inhoud van een beheersysteem en hen te attenderen op eventuele wijzigingen.	Medewerkers te ondersteunen in de toepassing van een beheersysteem.	Medewerkers adequaat te informeren over de inhoud en toepassing van het (data)beheer-systeem en over eventuele wijzigingen.
G	De ontwikkeling ter hand te nemen aan de hand van daartoe beschikbare proces-beschrijvingen.	In een lopend ontwikkelingsproces de planning aan te passen aan de resultaten van de eerste ontwikkelingsstappen.	Voorstellen te doen voor vervolgontwikkelings-stappen in een lopend ontwikkelingsproces.	Voorstellen te doen voor nieuw te ontwikkelen producten, processen of methoden.

5. Competentie adviseren | in- en verkopen

De Bachelor of Science geeft goed onderbouwde adviezen over het ontwerpen, verbeteren of toepassen van producten, processen en methoden en brengt renderende transacties tot stand met goederen of diensten binnen het domein Applied Science.

	Niveau I	Niveau II	Niveau III	Niveau IV
	De student verdiept zich in de problemen en/of wensen van gebruikers.	De student draagt bij aan het oplossen van een technisch probleem van een gebruiker.	De student geeft een concreet advies op een specifieke vraag.	Ervaren beroepsbeoefenaar (zie beschrijving competentie hierboven).
	Hij laat dat zien door:	Hij laat dat zien door:	Hij laat dat zien door:	Hij laat dat zien door:
A	Te luisteren naar de klant.	Relevante open vragen te stellen.	Flexibel met de veranderende eisen van de klant om te gaan.	Zich servicegericht op te stellen.
B	De opdracht helder en eenduidig te omschrijven.	De geïdentificeerde wensen van de klant te	Een gemotiveerd advies uit te brengen.	De vraagstelling van de opdrachtgever te verhelderen.

	Niveau I	Niveau II	Niveau III	Niveau IV
		rapporteren/ presenteren.		
C	Marktonderzoeks-gegevens te analyseren.	Marktonderzoeks-gegevens te interpreteren.	Marktontwikkelingen te signaleren en hierop in te spelen.	(Markt)onderzoek op te stellen en uit te voeren.
D	Acties te benoemen die op een marktonderzoek volgen.	Een actieplan op te stellen voor een marktonderzoek.	Een adviesplan op te stellen, rekening houdend met de eigen concurrentiepositie.	(Delen van) advies op te stellen.
E	De wensen van klant/opdrachtgever of gebruiker te herkennen als een relevant (technisch) probleem.	De wens van de klant te identificeren.	Met creatieve oplossingen te komen bij specifieke problemen of ontwikkelingen.	In overleg met onderzoekers en ontwikkelaars wensen en vragen van klanten te vertalen naar haalbare oplossingen of adviezen.
F	De klant/ opdrachtgever of gebruiker te kennen.	Op basis van vertrouwen een band op te bouwen.	Rekening te houden met de omgeving van de klant.	Relaties met klanten op een adequate wijze te onderhouden.
G	Verschillende onderhandelings-technieken te herkennen.	Geschikte onderhandelings-technieken toe te passen.	Belanghebbenden te overtuigen zodat wenselijke activiteiten ondernomen kunnen worden.	Bij in- en verkoop onder-handelings-technieken toe te passen.

6. Competentie Instrueren | begeleiden | doceren | coachen

De Bachelor of Science instrueert en begeleidt medewerkers en klanten bij het aanleren van nieuwe kennis en vaardigheden binnen het domein Applied Science.

	Niveau I	Niveau II	Niveau III	Niveau IV
	De student: geeft op verzoek eigen kennis en vaardigheden door aan medewerkers (door demonstreren en toelichten). Hij laat dat zien door:	De student: neemt initiatief tot instructie van medewerkers met een tekort aan kennis en vaardigheden. Hij laat dat zien door:	De student: brengt kennis en vaardigheden op didactisch verantwoorde wijze over aan medewerkers. Hij laat dat zien door:	Ervaren beroepsbeoefenaar (zie beschrijving competentie hierboven). Hij laat dat zien door:
A	Een bijdrage te leveren aan de instructie/demonstratie aan collegamedewerkers, studenten of leerlingen inzake een praktijkproef, etc.	Het verzorgen van een instructie/demonstratie aan collega-medewerkers, -studenten of leerlingen inzake een praktijkproef, etc.	Het zelfstandig verzorgen van een theoretische inleiding met instructie/demonstratie aan collega-medewerkers, -studenten, leerlingen of cursisten inzake praktijkproeven, etc.	Het zelfstandig verzorgen van theoretische inleidingen, instructies en demonstraties aan medewerkers, leerlingen, studenten of cursisten inzake praktische experimenten, het gebruik van apparaten, materialen en dergelijke.
B	Een bijdrage te leveren aan de begeleiding van medewerkers, leerlingen, studenten of cursisten inzake te gebruiken methodes en apparatuur, etc.	Mee te werken aan de begeleiding van medewerkers, leerlingen, studenten of cursisten inzake te gebruiken methodes en apparatuur, etc.	Een deel van de begeleiding te verzorgen van medewerkers, leerlingen, studenten of cursisten inzake te gebruiken methodes en apparatuur, etc.	Het begeleiden van medewerkers, leerlingen, studenten of cursisten inzake te gebruiken methodes en apparatuur, alsmede bij het verrichten van literatuuronderzoek, bij (praktijk) opdrachten.
C	Zaken helder uiteen te zetten.	Informatie over te brengen, rekening houdend met de doelgroep.	Complexe informatie over te brengen, rekening houdend met de doelgroep.	In diverse onderwijssituaties didactische vaardigheden toe te passen.

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D	Zich bewust te zijn van het belang van voortdurende deskundigheids-ontwikkeling.	Activiteiten te ontplooien t.a.v. de eigen deskundigheids-ontwikkeling en die van anderen.	Op basis van eigen ervaringen een bijdrage te leveren aan het coachen van medewerkers.	Het coachen van medewerkers en teams bij de ontwikkeling van deskundigheid.
E	Op verzoek feedback te geven op de evaluatie/beoordeling van de resultaten van instructies, etc.	Een beargumenteerde beoordeling/evaluatie te geven van de resultaten van instructies, etc.	Een bijdrage te leveren aan het opstellen van beoordelingscriteria en suggesties te doen voor verdere ontwikkeling.	Het evalueren en beoordelen van de resultaten van instructies, training en/of scholing.

7. Competentie leidinggeven | managen

De Bachelor of Science geeft richting en sturing aan organisatieprocessen en de daarbij betrokken medewerkers, teneinde de doelen te realiseren van het organisatieonderdeel of project waar hij leiding aan geeft.

	Niveau I	Niveau II	Niveau III	Niveau IV
	De student verleent assistentie en geeft richting aan medewerkers wanneer daar om wordt gevraagd.	De student verleent assistentie en geeft richting aan medewerkers om prestaties te verbeteren.	De student: zorgt dat doelen en rollen van leden van een team gedefinieerd zijn en ondersteunt het functioneren van de leden in het realiseren van de teamdoelen.	Ervaren beroepsbeoefenaar (zie beschrijving competentie hierboven).
	Hij laat dat zien door:	Hij laat dat zien door:	Hij laat dat zien door:	Hij laat dat zien door:
A	Blijk te geven van begrip van plaats en functie van zijn organisatie-onderdeel (stage-/afstudeerplek).	Eigen kennis en inzichten in te brengen bij het aanpakken van (nieuwe) activiteiten in de organisatie.	Ervoor te zorgen dat medewerkers duidelijk weten wat hun rol is in het bereiken van organisatiedoelen en hen hierbij te begeleiden.	Een visie te hebben betreffende het organisatieonderdeel en deze uit te dragen.
B	Mede voor taak- en werkverdeling te zorgen.	Assistentie te verlenen bij het oplossen van knelpunten in de planning en prioriteitstelling van werkzaamheden.	Bij het plannen van werkzaamheden een taakverdeling aan te geven, alsmede tijdpad, prioriteit-stelling en andere randvoorwaarden in termen van tijd, geld, kwaliteit, informatie en organisatie.	Project- en planmatig te werken.
C	Aanspreekbaar en bereikbaar te zijn voor medewerkers, medestudenten en docenten.	Medewerkers te motiveren door hen aan te spreken op hun kwaliteiten.	Taken te delegeren aan medewerkers overeenkomstig hun functie en kwaliteiten.	Medewerkers te coachen door te inspireren, te overtuigen, te motiveren, respect te tonen, samenwerking te stimuleren en te delegeren.
D	Eerlijk en betrouwbaar te handelen naar medewerkers, medestudenten en docenten.	Medewerkers aan te spreken op hun omgang met collega's.	Open en helder te zijn over de eigen positie en conflicten helpen op te lossen.	Zelf het voorbeeld naar medewerkers te geven.
E	Anderen te steunen in hun initiatieven.	Medewerkers te stimuleren om zelf nieuwe initiatieven te ontplooien.	Medewerkers te helpen bij het uitwerken van hun initiatieven.	Medewerkers een gevoel van gedeelde verantwoordelijkheid te geven.
F	Vanuit zijn eigen werkzaamheden bij te dragen aan vergaderingen en werkoverleggen.	In vergaderingen en werkoverleggen mee te denken met andere medewerkers en initiatief te nemen tot het oplossen van knelpunten.	De deelnemers aan de vergadering een doelgerichte bijdrage te laten leveren vanuit hun rol in het team.	Het voorzitten van vergaderingen en werkoverleg.

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G	Heldere en eenduidige uitleg of instructies te geven over een te verrichten taak.	Met andere medewerkers te overleggen om een gezamenlijk einddoel te bereiken.	Medewerkers op voortgang te sturen om de gestelde doelen te halen.	Taak- en procesgericht te communiceren.
H	Medewerkers inzicht te geven in het belang van de randvoorwaarden van het project.	In overleg een gemaakte planning bij te stellen om binnen gestelde randvoorwaarden te blijven.	De taken aan de deelnemers van het project zodanig toe te delen dat de randvoorwaarden optimaal kunnen worden gerealiseerd.	Een project te beheersen in termen van tijd, geld, kwaliteit, informatie en organisatie.

8. Competentie zelfsturing

De Bachelor of Science stuurt zichzelf in zijn functioneren en in zijn ontwikkeling en zorgt dat hij qua kennis en vaardigheden op de hoogte is van de nieuwste ontwikkelingen, ook in relatie tot ethische dilemma's en maatschappelijk geaccepteerde normen en waarden.

	Niveau I	Niveau II	Niveau III	Niveau IV
	De student reflecteert op eigen functioneren. Hij laat dat zien door:	De student reflecteert op eigen functioneren en ontwikkeling. Hij laat dat zien door:	De student stuurt zichzelf in eigen functioneren. Hij laat dat zien door:	Ervaren beroepsbeoefenaar (zie beschrijving competentie hierboven). Hij laat dat zien door:
A	Naar een vastgesteld leerdoel toe te werken. De leerstrategie en de daaruit voortvloeiende resultaten te bespreken; zich bewust te zijn van de functie van een leerdoel en hoe hij dat gebruikt in zijn leerstrategie.	In overleg/zelfstandig eigen leerdoel en leerstrategie te bepalen en op het resultaat te reflecteren.	Een loopbaanontwikkelingsplan te maken en zelf nieuwe leerdoelen te bepalen.	Op zelfstandige wijze een leerdoel en een leerstrategie te bepalen en uit te voeren en het resultaat terug te koppelen naar het leerdoel.
B	De eventuele noodzaak tot aanpassing van het eigen functioneren te benoemen in de studieomgeving.	Feedback op eigen functioneren te gebruiken voor aanpassing aan de werkomgeving.	Zijn functioneren aan te passen aan de eisen van de verschillende werkomgevingen.	Zich snel aan te passen aan veranderende werkomgevingen.
C	Over beroepsmatige en ethische dilemma's met anderen te communiceren en beroepsmatige of ethische dilemma's te benoemen.	Eventuele beroepsmatige en ethische dilemma's te constateren en daarover zijn mening te geven.	Aan de hand van maatschappelijk geaccepteerde beroepsmatige en ethische normen en waarden zijn standpunt te bepalen.	Bij beroepsmatige en ethische dilemma's een afweging te maken en een besluit te nemen, rekening houdend met maatschappelijk geaccepteerde normen en waarden.
D	Informatie te zoeken om eigen functioneren te verbeteren.	Kritiek op geleverd werk te verwerken en eigen functioneren met collega's te bespreken.	Eigen functioneren op grond van ervaringen aan te passen.	Feedback te geven en te ontvangen.
E	Eigen handelen en denken kritisch te evalueren. Bewust te zijn van het effect van de eigen werkhouding op anderen, zoals groepsleden bij een project.	Voor zichzelf inzake eigen handelen conclusies te trekken en die zo nodig ook naar anderen te verwoorden.	Eigen handelen naar anderen te verantwoorden en te maken keuzes te motiveren.	Eigen denken en handelen kritisch te evalueren en verantwoording af te leggen en te verwerken.

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During the graduation the student must meet the following required levels:

	Competence						
	1. Research	2. Experimentation	4. Management/coordination	5. Advice/procurement and sales	6. Instruction/supervision/teaching/coaching	7. Managing people	8. Self-management
Required level	III	III	II	II	II	II	II

Annex II: Information A4 for orientation day

During the return day 2 you will provide second year students who have showed an interest an A4 with the most important information. Make sure to take at least 20 copies to hand out.

What needs to be on the A4?

1.   **Details of the institution where your placement**

   is:

   Address   :

   Department   :

   Accessibility   :

   Max. number of mini-interns :

2.   Your details

   Name   :

   Address   :

   Telephone no. mobile/placement   :

   Email UAS Leiden/placement:

3.   Short description of your graduation assignment and your activities

Annex III: Requirements report

<u>Writing a report: an overview</u>

General

A report is, like a presentation, a way of communicating to others about the work/research that you have carried out. A report has the same function as an article and therefore has the same structure. The difference between a report and an article is that the article is written once the research question has been answered, whereas a report is a representation of an experiment or placement period. For this reason, negative research can also be described.

Given that the aim of the report is to be read by others, try to make it as readable as possible. This can be achieved by:

- writing briefly and concisely, leave out unnecessary information. Consider when writing each word/sentence whether it is necessary to include them;
- avoiding complicated sentence constructs;
- guiding the reader through the report. Show clear relationships between pieces of text in the report and explain the reasons for experiments;
  1. not using too many leading sentence constructs. Use as many active sentence constructs as possible (so DON'T write: this report will describe… but DO write: the report describes research into…);
  2. not making grammatical or spelling mistakes. This distracts the reader from your report.

Further, it is uncommon to use we/I/one in sentences (so DON'T write: I have researched…; but DO write: this report describes the research in which…).

Other tips:

- When you have written a piece of text, you can't see the mistakes. Hence, don't look at your text for a day or two, then re-read it;
- Read your report out loud; you will notice whether the sentences run smoothly;
- Let a fellow student read your report and invite feedback;
- Arrange for your supervisor to look at a concept version of the report.

Structure of a report

A report is built up from the following components:

- Title page
- Abstract
- Introduction
- Materials and Methods
- Results
- Discussion and Conclusion
- References

Figures and tables

Use figures and tables to illustrate results. Pay attention to the following points:

- Number the figures and tables, give them a title and a short description (caption) of what can be seen;
- The caption to a figure is placed below the figure, the caption to a table is placed above the table;
- Graphs are also figures. Make sure that the graph axes are labelled and provide the units.

Content: formulation

The objective, content and style of each component are described below.

- Title page

Objective: Provides general information about the research

Content: Title of the report, name of the author, (submission)date of report, draft number of the report, period in which graduation research was conducted, name of workplace supervisor (with title) and name of the graduation teacher (with title).

- Abstract

Objective: Provides the reader with an idea of the content, is it interesting to him/her? So: short and sweet.

Content: What is the subject/background, objective/research question, what did the author do, results, conclusion.

Language: Write in the present tense.

Tip: Write the abstract at the end!

- Introduction

Objective: Indicate why the research has taken place.

Content: This is where you describe the research question and/or the objective of the research. To do this provide background information about the subject/research and discuss the principles of the relevant techniques that were used. It is important that you use and refer to the relevant academic literature.

Language: Write in the present tense.

Tip: Write the introduction first so that you are conscious of the reason for your research and which results are important to your report.

- Materials and Methods

Objective: Describe how you have tried to answer the research question.

Content: Describe "what" you have used for your analyses (which programmes/tools but also which biological materials and/or datasets) and how the analyses and the experiment have been conducted. Don't turn this into a logbook but describe the bigger picture in an account (not point by point). SO NOT: Opened Excel, selected data, filtered data with a log2 Cy3/Cy5 value above 2.5 with an autofilter. Subsequently selected all the log2 Cy3/Cy5 values below 2.5. These data were copied to a new file. BUT: Genes were considered as differential to expressed, when the log2 Cy3/Cy5 values were above 2.5 or below -2.5.

Language: Write in the past tense.

Tip: Write the materials and methods whilst conducting the experiment/analyses. That is the quickest way to write up this component.

- Results

Objective: illustration of your results.

Content: Describe here the results from the experiments/analyses. In the results you can include experiments that were not successful. If you have figures and tables you can describe data through these figures and tables (also refer in the text to these tables and graphs). DON'T PROVIDE THE CONCLUSION YET.

Language: Write in the past tense.

Tip: To guide the reader and to create a smoothly running account, state regularly how and why the experiment was conducted.

- Discussion and Conclusion

Objective: answer the research question.

Content: Discuss your experiments' results and draw conclusions from these. Use statistics, literature or benchmarking to describe the reliability of your research. Discuss the "weak" points of your experiment which may influence your conclusions. Compare your results with those in the literature. Does this strengthen your conclusion or does this raise new questions? With negative results, discuss the (possible) reasons for these. Provide recommendations for further research.

Language: use present tense where possible.

Tip: Write the discussion after the results, introduction and materials and methods. Literature discussed in the introduction can be used again here.

- References

The references consists of all the (academic) articles, books and websites which you have used in your report. You refer to these sources in the text by using a number. The allocation of these numbers is according to the order in which sources are referred to in the text. Use the **American Medical Association (AMA citation rules)** to correctly show sources and references.

Annex IV: Procedure graduation sitting

Procedure graduation sitting
During the graduation sitting the student gives a presentation about the work he has carried out during the graduation to the graduation committee which consists of the following persons:
- Examiner 1 (graduation teacher and chair of the graduation sitting)
- Examiner 2 (second teacher from UAS Leiden)
- Workplace supervisor
- Examination regulator (potentially)

The presence of an examination regulator is dependent on the availability of an appropriate candidate. The confidential nature of the graduation report can be a reason not to invite an examination regulator to the graduation sitting. This means there will not be an examination regulator present at every graduation sitting.

- The workplace supervisor will present himself at the central desk of UAS Leiden and will be received by one of the examiners. The student goes straight to the classroom where the graduation sitting takes place to prepare their presentation.
- Examiner 1 opens the sitting.
- The student gives a presentation of 20-30 minutes (the maximum duration of 30 minutes is strictly enforced. Any part of the presentation beyond the 30 minute cut off point will not count towards the assessment of the presentation. After 25 minutes the student is informed by examiner 1 that 5 minutes of the presentation time remain).
- The graduation committee questions the student about the presentation for 20 minutes.
- The student and potentially guests leave the room.
- The graduation committee discusses the work submitted by the student during the graduation and the graduation presentation.

Procedure step by step:
- The graduation committee enter the components "bafstu realisation" and "bafstu defence" into Gradework. For each sub-question a clarification is given for how the grade was arrived at for that particular sub-question.
- For each sub-question examiner 1 gives the workplace supervisor the opportunity to express show satisfied the company/institution is with the achievements of the student. An assessment takes place for every sub-question by both examiners.
- Examiner 1 completes the digital bafstu cover page.
- The final grade is subsequently calculated. The final grade is the weighted average of the grades for the components "realisation graduation assignment", "report" and "graduation defence" (the weighting factor is stated in "assessment form graduation sitting").
- Examiner 2 checks whether the calculation of the grade has been performed correctly.
- Examiner 1 and Examiner 2 sign the digital bafstu cover page.
- Examiner 1 discusses whether the report is confidential and if so, until what date the confidentiality must be upheld. If the report is not confidential it can be used to inform students, external regulators (OAC) and/or for pr purposes (open house etc.).
- Examiner 1 calls the student back.
- Examiner 1 notifies the student of the assessment and the final grade.
- The sitting is closed by examiner 1.
- Examiner 1 enters the final grade for graduation (Bafstu) as "concept" in Osiris.
- Examiner 1 sends the completed assessment forms to the student via email for their perusal.
- Examiner 1 consults with the student about the length of the perusal time. It is important that the grade can be determined on time in Osiris.
- After the perusal time has elapsed, examiner 1 determines the grade in Osiris.