HAN_UNIVERSITY OF APPLIED SCIENCES

Degree Statute and Education and Examination Regulation of the Master's Degree

Course Molecular Life Sciences 24-25

School of Applied Biosciences and Chemistry
Academic year 2024-2025

Adopted: 11 July 2024
Consent school council: 23 May 2024
Consent degree committee: 06 May 2024

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PART 1 General part

Adoption

This degree statute was adopted by the dean on 11 July 2024, after consent was received from the degree committee on 06 May 2024 and consent from school council on 23 May 2024.

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1 About the degree statute

This degree statute has been formulated according to the model degree statute for master programmes of HAN University of applied Sciences. The courses described in this degree statute consist of units of study.

This degree statute will use the term “course” from this point onward.

The Higher Education and Research Act stipulates in article 7.59 that an institution such as HAN University of Applied Sciences (hereafter HAN) is obliged to adopt and publish a student charter. The Student Charter consists of two parts: the institution-specific part (which we call the 'Student Charter') and the degree-specific part (which we call the 'Degree Statute').

The degree statute consists of three parts:

- Part 1: General part.
- Part 2: The Education and Examination Regulations, which outline the education, final assessment, exams and modular exams for your degree programme.
- Part 3: Other regulations.

Part 1 is purely informative. No rights can be derived from it. Rights and obligations can be derived from the other parts; these are legally applicable regulations.

1.1 Which degree programme(s) does this degree statute apply to?

This is the Degree Statute for the following HAN degree programme(s):

Degree programme	Degree format	CROHO number	Degree after graduation
M Molecular Life Sciences		49293	Master of Science

This degree statute contains information on the structure, organisation and execution of the degree programme, education, student facilities, counselling and study coaching, the education and examination regulations and the other degree-specific regulations that describe student rights and responsibilities. When this document subsequently refers to 'the degree programme', we mean the above degree programme(s).

1.2 How do you read this degree statute?

We use regular UK spelling rules.
When we use 'you', we mainly mean you as an internal or external student enrolled in this degree programme at HAN. But we also mean others, such as prospective students.

When we use 'the student' we refer to all students: male, female and non-binary.

1.3 How long is the degree statute valid for?

A new degree statute is written for each HAN degree programme every academic year. The degree statute for a certain academic year applies to everyone enrolled in the degree programme for that academic year. It does not matter which phase of your degree programme you are in, whether you are an internal or external student, or when you started. You can find the digital version of the degree statute
here: https://www.hanuniversity.com/en/programs/master/molecular-life-sciences/fulltime/practical-info/#student-serv

ices-and-support.

This degree statute applies to the 2024-2025 academic year: from 1 September 2024 to 31 August 2025. For students starting their degree programme on 1 February 2025, two different degree statutes apply consecutively during their first 'year': the current one and that of the next academic year.

Did you enrol in the degree programme in a previous academic year? And is the degree programme working with a renewed curriculum or modifications in the education and examination regulations? Then certain provisions in the education and examination regulations may apply from a degree statute form a previous academic year.

1.4 How does the degree statute come about?

The degree statute for the degree programme is adopted by the dean each year. It is based on the model degree statute: a model that applies for the entire HAN.

The school council exercises the participation rights on the degree statute, but only in so far as the HAN participation council has not already exercised these rights through the model degree statute and in so far as these rights have not been conferred to the degree committee. How this works exactly is set out in the Participation Council Regulations and the Regulations of the Degree Committee.

Advice is requested in advance from the degree programmes board of examiners.

The relevant HAN organisational bodies strive to publish the new degree statute each year before 1 July.

1.5 Consistency of degree statute, student charter and enrolment regulations

The Degree Statute is part of the Student Charter. The Student Charter applies to the entire HAN. The Student Charter lists all the rights and obligations of students and HAN.
The Student Charter can be found here: Student Charter | HAN University of Applied Sciences.

You can find the rules for application, admission, educational requirements, selection and enrolment in the Enrolment regulations. The degree statute only contains a number of specific additions to this. These additions may not contradict the rules from the enrolment regulations.
The enrolment regulations can be found
at: https://www.han.nl/opleidingen/master/molecular-life-sciences/voltijd/praktische-info/ .

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2 Education at HAN

Your degree programme is part of the HAN educational offerings. HAN has an overarching mission and vision on higher education. Your degree programme embodies this vision in its own way. HAN's mission and vision are described in the HAN Institutional Plan. You can find this plan on han.nl

The HAN goals for the period from 2022-2028 are described in the HAN Institutional Plan: "For a smart, green and social world of tomorrow". You can find this plan on han.nl

3 Information about your degree programme

3.1 Mission and vision of your degree programme

The professional field of our master programme is the bioscience sector. This sector branches into pharmaceuticals and biotechnological companies, molecular research and diagnostic departments at (academic) hospitals, and university research groups who are active in applied or translational research and product development. This HAN Master in Molecular Life Sciences is a Professional Master that is specialised in applied/translational research and product development in the bioscience sector. The programme is strongly focussed on combining the laboratory and technical skills students previously acquired with competences required for managing projects within the bioscience sector. Therefore, the focus and characteristics of a Professional Master graduate will be different in comparison to the academic Master graduate.

The Master in Molecular Life Sciences graduate has a profound knowledge of biochemistry and of molecular and cell biology of prokaryotic and several eukaryotic organisms, thereby being specialised to perform Bioscience-related projects. Moreover, being trained in project management, interdisciplinary thinking and communication, in combination with an entrepreneurial focus (such as patent searches and business development), the HAN Master in Molecular Life Sciences is prepared for a role in applied research and product development phase in industry, or in applied/translational research in research institutions of the bioscience sector.

Social and organisational context

The HAN Master in Molecular Life Sciences graduates is prepared for working in different stages of the business pipeline that the bioscience industry uses for product development. As such the HAN Master Molecular Life Sciences programme takes in a unique position in the master programmes offered in the Netherlands. It serves the industry need for interdisciplinary, goal- and market-oriented professionals specialised in applied research and product development of both biotechnology companies as well as research institutions active in applied/translational research.

The Master Molecular Life Sciences graduate can be employed at:

1. Companies active in biotechnology, in fields such as pharmacy, personal health care, diagnostics, plant sciences, food- and feed industry etc. These can be small and medium enterprises as well as multinationals.
2. Research institutions such as universities, hospitals or governmental/private (contract) research institutes.

Examples are:

1. MSD, MSD Animal Health, DSM, DuPont, Byondis, Batavia Biosciences, Qiagen, European Veterinary Laboratory, QM Diagnostics.
2. TNO, RIMLS, NKI, Universities and (University) Hospitals.

Key features

A key feature of the programme is the strong link between the profession or practice and the degree course. This emerges clearly from the requirements set for students' practical experience and the close relationship between the education, professional field and organisations or businesses at which the student is employed. We strive for a high-quality connection between practice-based research and education.

Our basic standard for all this is the human scale, which means: small-scale, clear and with directly accessible lecturers and coordinators.

3.2 Content of your degree programme

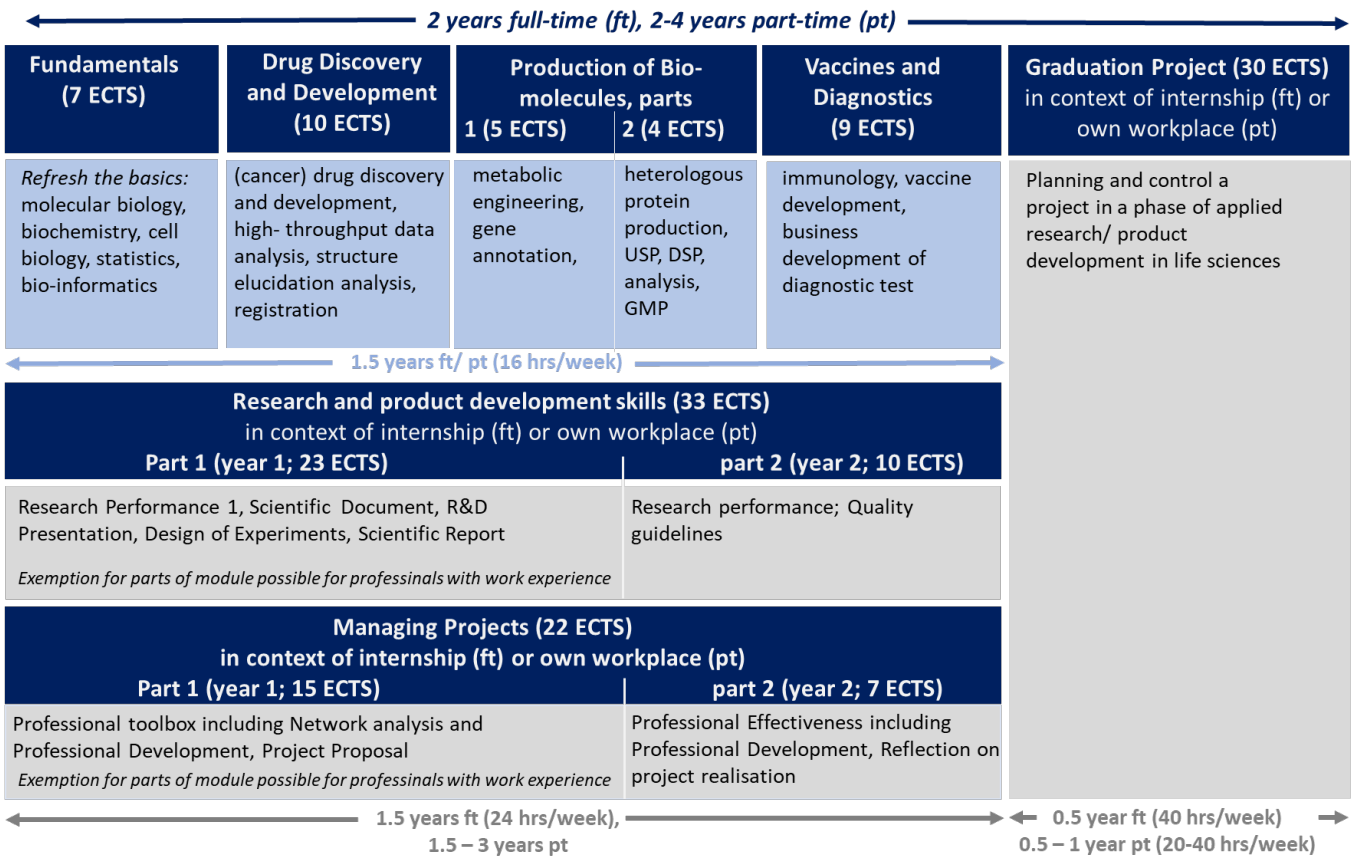
This section gives a broad description of your degree programme. You can find the rules and details in Part 2, the education and examination regulations, and in the regulations in Part 3.

3.2.1 Scope

The scope of the degree programme is represented in courses and study load. One credit is equal to 28 hours of study (this is an average indication). This is also stipulated as such in the Higher Education and Research Act. Your master degree programme has a study load of 120 credits.

In the part time and work study degree format, these are grouped in 7 modules

3.2.2 Degree content



3.3 Organisation of your degree programme

Management and organisation at degree course level

The programme is designed and organised by a core team. The core team is responsible for continuity, content,

cohesion and coordination of the education. The team is supported in this by the secretarial office, which is located in room 0.07 of the Institute of Applied Sciences (on Mondays) and can be reached via 024-3530586 on all other work days.

The core team of the Master's degree programme is composed of the following members:

Andrea Thiele (PhD), coordinator

Remko Bosch (PhD), responsible for curriculum

Marloes Vissers (PhD), member of the examination committee

Danny Godfrey (BA (Hons)), course coordinator

Jan Rademaker (PhD), internship coordinator

Organisation at School level

MMLS belongs to the School of Applied Biosciences and Chemistry. The director of the School of Applied Biosciences and Chemistry is H. Neidig. The SABC management reports to the directors of HAN (see also Chapter 6, HAN organisation, of this document).

3.4 How we educate and supervise

Good higher professional education is attuned to the developments in society and the professional environment. We are in close communication with potential employers to monitor what they demand and desire in a graduate. With that goal in mind we offer a programme with a very distinctive and unique character attuned to market demands to prepare best for the job market.

We are convinced that learning in the professional context is most effective. Therefore, we value the central role of professional practice in our education and we have made learning through practicing professional tasks the key principle of our curriculum. Professional tasks are meaningful tasks, as complex as those that are performed in the 'real' working environment. Students will work on projects in their entirety, not on parts thereof to practise a professional task in full. In our curriculum, this is realised in two ways: firstly, by learning in professional practice (workplace learning) and secondly by learning on project cases. Learning in professional practice implies that student work on projects within the product development pipeline in bioscience in practice and in this, develop from project member to being responsible for a project.

The 'projects cases' that we have selected represent different product development pipelines present within different areas of the bioscience industry. In our programme, projects are defined as course units and all assignments within a particular course unit represent professional tasks belonging to one project. This means that multiple competences will be addressed in each course unit. We aim to acquiring the necessary set of competences with accompanying knowledge that are immediately and sustainably profitable for both students and their respective employers. Our defined set of competences, supported by a number of criteria (indicators), are the scaffold of our programme and the student's activities are always reviewed using the indicators as reference. The competence training is placed in the context of our so-called Body of Knowledge and Skills (BoKS). Both the competences and the BoKS are regularly reviewed and verified by representatives of the professional practice. We provide lectures, workshops, trainings, current literature and feedback by experts to support students in realising assignments (representing professional products) to complete a task (see figure 2). In doing so we ensure proper development of skills and attitude with accompanying Body of knowledge for all students. This way of active learning in the professional

context enables students to apply their competences and knowledge in other situations and projects at their work place.

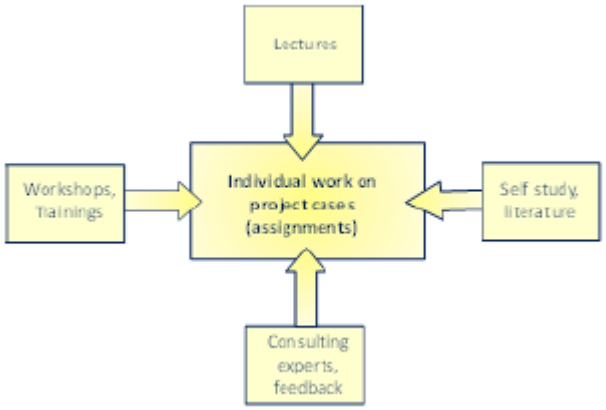


Figure 2. Schematic presentation of the case-based education of the Master in Molecular Life Sciences education programme. Assignments related to the professional practice are central in the learning process and supported by lectures, workshops, trainings, the literature and feedback by experts.

In the final module (major project), all competences are integrally applied and all individual indicators are reviewed and must be assessed sufficient. This is done through an integral assessment in which a project proposal, the project work, the master thesis, and the presentation and discussion are evaluated by a group of examiners. As such, a graduate will demonstrate that he/she has required all the competence indicators that belong to our professional master in molecular life sciences.

International orientation

An undeniable feature of the bioscience sector is the many collaborations across borders and the international composition of staff. In accordance, the Master MLS is entirely offered in English and students are from various countries. The curriculum structure represents the professional practise, and therefore the degree programme intrinsically applies international standards and competences.

3.5 Internships and/or workplace

Full-time students spend 3 days a week working as an intern in a laboratory at either a company or institute during the first three semesters of the programme. The other 2 days are used for attending lectures and other study activities. Semester 4 is dedicated for the graduation project during which students spend 5 days a week as an intern.

3.6 How the professional field is involved

Professional advisory committee

In monitoring the quality of the programme, HAN attaches great importance to the opinions of experts from the professional field in question. These experts meet at least once a year in the meetings of the professional advisory committee.

The professional advisory committee consists of the following members:

- Henny Hofs PhD (Pharmaceutical Consultant & Toxicologist), PSDD, Nijmegen
- Anniek van der Waart (Department Laboratory Medicine), Radboudumc Nijmegen
- Nienke Vriezen PhD (Head Upstream Biotechonology), Byondis
- Martijn van Hal MSc (Director Operations), MSD
- Mark van Geffen PhD (Enzyre)
- Rik op den Camp PhD (Keygene)
- David Agorku (Miltenyi Biotec)
- Jan-Paul Favier PhD (Director) CLS Services
- Jean Paul Meijnen (Ginkgo Bioworks)

External supervisor

External supervisors are appointed to monitor and assess the quality of the final assessment.

Assessing the quality of the final assessment concerns in particular:

- the quality of examinations and assessment
- the quality of students (realisation of intended exit qualifications)
- the quality of the organisation of the final assessment.

The external supervisor is: Drs. Paul Smeets

External Advisor

The External advisors are chosen from companies or institutes of the biosciences sector. The External Advisor has an advising role for the assessment of the candidates for the Master's degree. The External Advisor has the following tasks:

- Judges the final report and presentation based on the assessment criteria.
- Formulate questions based on the Graduation Project Portfolio and presentation.
- Advises about the final assessment.
- Gives feedback on the final assessment with respect to content and process.

3.7 Research groups and research centres

Research groups relevant to the programme

The research groups Biobased Innovations (Biobased research en Bio-informatica|Data Science & Anti-Microbial Resistance) and Drug Discovery are involved in the Degree Programme.

The research groups are active in research and development in biotechnology and Drug discovery. Expertise are bioinformatics, molecular biology, (bio-)chemistry, (bio)analytical chemistry, fermentation technology and downstream processing. Current projects focus on efficient protein production using micro-organisms, on microbial oil production, development of tools for biorefineries, on the identification of new antimicrobial compounds. The contract research organisation HAN BioCentre is part of the research group Biodiscovery.

Staff of the research centre is structurally involved in the master degree course and the module Production of Biomolecules is directly related to research activities of the research group Biodiscovery.

The Research group Drug Discovery started in 2020 and focuses on improving processes necessary for the

development of new medicines, such as the discovery of new targets for diseases (biological targets). They develop validated test systems with increased translation possibilities to humans (reduce animal testing), such as using *C. elegans* as a screening system for various compound activities (e.g. toxicity). In addition, the research group focusses on the discovery of green molecules that interact with these biological targets.

The professor of the research group Drug Discovery is involved in the module Drug Discovery and Development of the degree course.

Further, some students of the masters course can combine the study with an internship at HAN research groups. They apply the knowledge and skills acquired in the master degree course in their internship as research member/technicians, and *vice versa*, the master course helps them to fulfil their role in the dynamic research environment in applied research for industrial clients.

3.8 Quality Assurance

The aim of quality assurance within the Masters degree programme is to work continuously on improving and guaranteeing quality. Quality assurance is carried out according to the parameters drawn up by the HAN University of Applied Sciences and elaborated for the Masters programmes in the "*HANdboek Kwaliteitszorg Onderwijs*", 2011, update 2015 (HANdbook of Quality Assurance in Education).

Different stakeholders, which are students, professional field (professional advisory committee, the HAN Research group Biodiscovery and diverse other contacts), lecturers and alumni are involved in the quality assurance cycle. They are formally asked about their opinion about various quality aspects of the programme on a regular base, and are stimulated to give informal feedback. Evaluation scores are compared to targets. Possible causes for scores lower than targets are discussed, and improvement actions are initiated, carried out, communicated and evaluated. By continually going through Deming's Plan-Do-Check-Act cycle (PDCA cycle), the programme aims for continuous improvement of the quality of the programme.

In addition, the external supervisor has the task to give feedback on the realization of the final qualifications, their assessment and teaching supporting students in acquiring these.

The quality assurance system of the Master Molecular Life Sciences is described in the annual "Kwaliteitszorgrapportage" of the programme.

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4 Exit qualifications and professional requirements

4.1 The professional field

The professional field of our master programme is the bioscience sector. This sector branches into pharmaceuticals and biotechnological companies, molecular research and diagnostic departments at (academic) hospitals, and university research groups who are active in applied or translational research and product development.

Aim of the programme

The aim of our programme is to educate masters that are able to plan and control a project(*) in applied research and/or product development in the bioscience sector.

(*) Projects can also be parts of projects and have a length of at least 3 months.

Professional tasks:

To meet this aim, we have discerned three professional tasks for our Professional Master in Molecular Life Sciences:

1. to understand practical, economic, social and/or ecological needs of businesses, market and society that can be anticipated by biotechnology;
2. to apply fundamental knowledge in the area of molecular life sciences to find sustainable solutions for these needs;
3. to implement such solutions in a successful and efficient way by organizing their realisation in projects, considering the interdisciplinary dimension and communicating with different experts. Such projects have a duration of at least three months.

The professional master is responsible for the realisation of projects in applied research and product development. In this role, our professional master is of added value for organisations in the bioscience sector (companies, hospitals or the R&D institutions) and supports senior project leaders by creating a short and effective link between company policies and hands-on projects operational at bench level. The Master in Molecular Life Sciences graduates can take position in the interphase between research/innovation and standardised processes (such as production, analysis and diagnostics). Such functions can be for instance scientific QC support or technical operations support. The function name of our masters varies within companies. Examples are Senior Researcher, Junior Scientist, Assistant Project Leader, Associate Project Leader or Junior Project Leader. Some graduates have decided to continue their career with a PhD project in applied or translational research or product development.

4.2 Professional requirements

Not applicable

4.3 Exit qualifications

Competences

To apply and translate knowledge for the realisation of innovation and implementation of projects in the bioscience sector, the Master in Molecular Life Sciences needs to have specified competences.

These core competences are defined in dialogue with representatives of the professional practice. The six competences are:

- Professional conduct and professional development.
- Designing strategies for applied research and product development
- Design, analysis and control of experiments
- Communication
- Managing Projects
- Advising

These competence indicators, together with the Body of Knowledge and Skills, form the final qualifications of the Master in Molecular Life Sciences.

The following section gives a more general description of the competences of the Professional Master in Molecular Life Sciences, and is compared with the Professional Bachelor graduates in the area of Life Sciences, and with the academic Master equivalent (see figure 3).

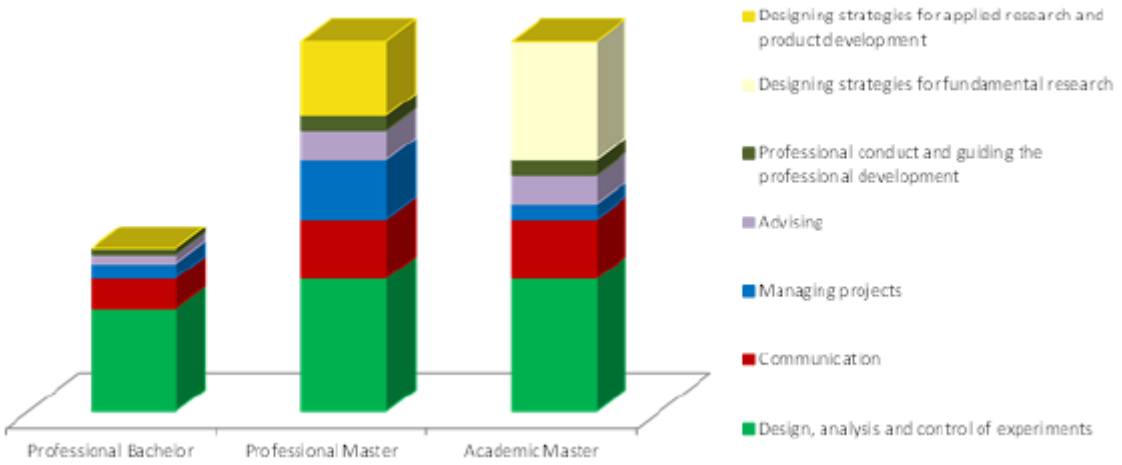

Figure 3. Schematic presentation of the competence profile of the Master in Molecular Life Sciences (a Professional Master) in comparison to the Professional Bachelor and the Academic Master in the field of life sciences. The characteristic Competences of the Master in Molecular Life Sciences are Designing Strategies for applied research and product development and Managing Projects.

The comparison of figure 3 shows that the two competences ‘designing strategies for applied research and product development’ and ‘managing projects’ are prominent competences for the Professional Master in Molecular Life Sciences. This in sharp contrast to the Academic Master programme in which designing (fundamental) research based on theory, curiosity and new ideas is key. Below follows an evaluation of the competences of our programmes and compares them with competences of the equivalent academic masters and bachelor graduates.

1. Graduates of all three type of programmes need to be professional in terms of being pro-active, team-oriented personalities who reflect on their own actions, deal with feedback and are open to learning. Both master graduates are expected to learn autonomously. While the academic master is mostly a theory-driven curious personality however, the professional master shows an entrepreneurial attitude. As the professional master functions at the interphase between different expertise, establishing a coherent network belongs to his/her

professional conduct as well. In addition, we expect that masters are able to reflect on the quality of their projects, their own role in projects, and on their own professional personality.

2. Our Professional Master designs strategies for applied research and product development in a product-, goal- and market-oriented way. He/she understands practical, economic, social and/or ecological needs. He/she is aware of the information obtained by fundamental research, but also of other factors such as costs, competitors or the patent situation and uses this information to achieve the company aims.
3. The competence design, analysis and control of experiments is important for all programmes of figure 3. Professional experience will increase after graduation at bachelor level but master employees are expected to conduct design, analysis and control of experiments at a higher level of quality, complexity and independency compared to bachelor trained employees.
4. Communication is another competence necessary for both bachelor and master graduates. However, whereas bachelors communicate predominantly over their experiments within research groups, masters are expected to have professional written and oral communication skills enabling them to communicate beyond their own group. Moreover, while for academic master, communication occurs mostly with peers through publications and presentations, communication of the professional masters often occurs in an interdisciplinary context. Communication with experts of different fields such as biology, statistics, patents specialists, legal affairs or finance departments is important for the efficient realisation of entrepreneurial projects.
5. Managing Projects in terms of project aims, deliverables, value, risks, responsibility, communication time and costs is typical for the professional master. It is a minor competence of the bachelor graduate and of the Academic Master graduate.
6. In line with competence 4, the professional master mainly informs and advises about aims, multidisciplinary interest, project approaches and results to people within and outside their own department. In contrast, the academic master is able to provide argument-based advice about research projects to others. The Bachelor, in contrast, advises about lab equipment or experimental techniques within the research group.

The professional tasks defined for our MMLS programme versus the needed competences:

Competences Professional tasks	Professional conduct and guiding professional development	Designing strategies for applied research and product	Design, analysis and control of experiments	Communication	Managing projects	Advising
to understand practical, economic, social and/or ecological needs of businesses, market and society that can be anticipated by biotechnology	x	x		x	x	x

to apply fundamental knowledge in the area of molecular life sciences to find sustainable solutions for these needs		x	x		x	x
to implement such solutions in a successful and efficient way by organizing their realization in projects, considering the interdisciplinary dimension and communicating with different experts. Such projects have a duration of at least three months.	x	x		x	x	x

Body of Knowledge and Skills of the Master in Molecular Life Sciences

Upon graduation, the student

Molecular biology (techniques)

- has knowledge and insight of genes, chromosomes, plasmids mutations/ SNPs
- has knowledge and understanding of the principle of all standard techniques to detect DNA (such as Southern Blot, PCR, FISH, (next generation) sequencing), RNA (such as Northern blot,(q) RT-PCR, expression array, RNAseq, in situ hybridization) and proteins (such as SDS-PAGE, Western blot, immunocytochemistry, immunohistochemistry, protein array, mass spec) and to detect the interaction between biomolecules (e.g. immune-precipitation, chromatin-immunoprecipitation) and can apply the appropriate technique to answer a question about the presence, quantity, alteration/modification, or localization or interaction of DNA, RNA or protein"
- understands how gene expression is regulated in prokaryotes and eukaryotes and applies this knowledge to heterologous gene expression
- is able to design a strategy for gene cloning and heterologous expression
- understands the mechanisms of gene silencing by siRNA and is able to apply siRNA to downregulate gene expression
- is able to design a (conditional) knock-out strategy (e.g. by Crispr-Cas)

Cell biology (techniques)

- has knowledge and insight of prokaryotic and eukaryotic cells, function of organelles, cell cycle regulation, DNA repair, signal transduction, protein modification and localization

- understands the principle of techniques to analyze cell proliferation, cell cycle, apoptosis, protein modification and can apply these techniques to answer question on such cellular functions
- has knowledge and insight of the molecular mechanisms that contribute to cancer development and can apply this knowledge for the design of cancer diagnostics and anti-cancer drugs

Biochemistry (techniques)

- has knowledge and understanding of the physic-chemical properties of proteins, nucleic acids (DNA, RNA), sugars, lipids, endotoxin, salt, viruses and bacteria
- has knowledge and understanding of biomolecule purification methods (such as size exclusion chromatography, ion exchange, hydrophobic interaction, ultrafiltration, affinity chromatography, precipitation, filtration, drying) and is able to choose a purification method depending on the composition of the original sample and the biomolecule to be purified
- has knowledge and understanding about methods to analyse biomolecules (such as NMR, chromatography, enzyme assays, ultrafiltration, absorption measurement, selective breakdown, enzyme immune-assay) and is able to choose an analytical method based on the biomolecule(s) to be analyzed
- has knowledge and insight of metabolic pathways, cell chemistry and biosynthesis and can apply this knowledge to optimize metabolite production (metabolic engineering)

Enzyme production

- knows the industrial applications of enzymes

Vaccine discovery

- has knowledge and understanding of the immune response to pathogens (action of innate and adaptive immune system, induction and effects of cellular and humoral immunity, mechanisms for induction of memory)
- understand the mechanisms by which micro-organisms can cause disease
- knows different types of vaccines (such as attenuated, inactivated, subunit, recombinant, DNA), their mode of action and their advantages and disadvantages
- is able to choose a vaccine antigen, adjuvant and administration route depending on the immune response that is required and on practical aspect
- knows different vaccine production platforms, their advantages and disadvantages
- is able to design experiments to test the potency of a vaccine

Development of diagnostic tests

- knows different types of diagnostic tests, their principle of action and their advantages and disadvantages
- is able to define the importance of sensitivity, specificity, and other performance characteristics based on the desired application of the diagnostic test
- has insights in the principles, advantages and disadvantages of different diagnostic tests, e.g. serology and molecular diagnostics
- is able to choose a type of diagnostic test based on the required specificity, sensitivity, precision and practical aspects such as duration, requirement for staff training

Drugs Discovery, Development and Delivery

- understands the principles of pharmacology, pharmacokinetics & drug-biotransformation, and pharmacodynamics
- knows and understands drug design principles
- knows and understands the principle of different types of drugs and treatment approaches (small molecules, antibodies, gene therapy, chemotherapy, radiotherapy, immunotherapy), their advantages and disadvantages.
- Understand the procedures and principles involved in the preparation and structural analyses of unknown substances using UV, IR, MS, and NMR.
- is able to choose one type of drug as an active pharmaceutical ingredient depending on the desired biological effect
- is able to choose a delivery system based on desired selectivity and bio-availability
- is able to design a strategy to measure the bio-availability of the drug
- is able to choose appropriate in vitro and in vivo assays to test the efficacy and the toxicology of a drug
- knows which animal models can be used to test drugs, and the advantages and disadvantages of these models
- knows the different phases of clinical studies and what is required to enter the clinical phase of drug development
- knows that structure-analysis can be used to predict the function of the biomolecule and to discover interaction partners/ drugs

Quality assurance and quality control

- is able to define quality requirement for products and processes based on regulatory guidelines
- is able to describe a target product profile and critical quality attributes
- is able to design a strategy to validate a diagnostic test
- is aware of the requirements for entering the clinical phase, and for market entry
- is able to design a strategy to validate a diagnostic test
- is able to determine the sensitivity, specificity and precision of a diagnostic test

Process development and optimization

- knows the advantages and disadvantages of different production strains and is able to choose a suitable production strain for the production of specific proteins
- is able identify critical parameters in the process
- tests critical parameters in the production process (USP and DSP) and interprets the outcome
- is aware of the fact that scaling up or down requires process re-optimization

Biobased economy

- is able to explain the main principles of a biobased economy and its new technological challenges
- is able to explain the difference between first, second and third generation feedstocks
- is able to describe the steps needed to convert plant biomass into fermentation feedstock

- is able to describe the technological challenges by using biomass as fermentation feedstocks

Statistics and experimental design

- understands the meaning of: statistical hypotheses, type of variable (continuous / categorical), association versus causation, confounding variables, variation, normal distribution, population versus sample, dependent and independent observations, Type I and Type II error, descriptive statistics, the relationship between central tendency (mean, median) and variance, p-value and statistical significance, log-transformation, one- or two-sided tests, multiple testing problems and its solutions
- is able to translate the research question into an appropriate statistical question, experimental setup and corresponding statistical analysis
- has awareness of power and sample size calculations
- understands the basics of design of experiments (DOE)
- methodology, including: design of experiments, randomization, blocking by nuisance factor, factorial design, screening design, comparative designs, optimization design, one-factor at a time
- is able to design and analyze a screening and / or process optimization experiment using experimental design
- is able to choose the appropriate statistical method for data Analysis, including t-test, ANOVA, multiple regression, chi square tests
- understands what determination of sensitivity, specificity and precision of a diagnostic test implies, including its statistics and ROC curves
- is able to report the results with tables and graphics

Bioinformatics

Data Mining

- is familiar with biological databases Databases (such as Uniprot, Genbank, PDBe, PFAM, PROSITE, CDD, PubMed, KEGG.EBI, EMBL, NCBI)
- is able to formulate a data strategy to answer a biological question.
- is able to annotate sequences (DNA and protein sequences)
- is able to use the principles of transcription, mRNA processing, translation, post-translational modifications and protein structure/domains to evaluate sequence annotation.
- is able to perform BLAST-searches and analyse the results in a correct way.
- is able to align sequences and intepret score matrices and phylogeny
- knows the features of a qualitatively good alignment.
- is able to illustrate the use of (multiple) sequence alignments.
- is able to evaluate the evolution of sequences
- can analyse High-throughput data analysis
- understands the principle steps in analyzing high-throughput data obtained by –omics approaches.
- has analyzed and interpreted a limited number of high-throughput data and is able to communicate to specialists about such analyses

Intellectual properties

- is aware of the rights derived from intellectual properties and understands which implications these have for the production of generics and biosimilars

- is able to use patent databases to identify patent blocks
- is aware that he/she needs to contact patent experts if he/she is not sure how to interpret patent databases

Bio-business

- understands the meaning of the terms business models and business development, business value and financing
- is able to translate his/her projects plans in a concise business plan

Interpersonal skills

- is aware of his own cognitive style and recognizes the styles of team members
- has insight in different factors that contribute to an effective communication process
- knows the principles of situational leadership
- knows how to deal with possible conflicts
- is aware of intercultural differences

This section describes your exit qualifications at the end of the degree programme. These exit qualifications are formally set in the education and examination regulations.

When you graduate, you conform to the exit qualifications of the degree programme. In other words, you have certain (required) knowledge, understanding, skills and (if relevant) attitude, for the profession you have been educated for. The exit qualifications for your degree programme are outlined below.

Nr.	Exit qualification	Description
1	Professional conduct and guiding professional development	1.1. Shows a professional, pro-active, curious, scientific and entrepreneurial attitude: adapts quickly, motivates him/herself, shows initiative, is goal-oriented, and acts honestly and efficiently 1.2. Works efficiently in a team (colleagues, project leader, client) during all phases of the project through open communication and by considering the needs of others. 1.3. Pro-activity contributes to setting up and maintaining a professional network. 1.4. Critically reflects on the project with respect to scientific project management approach and results. 1.5. Critically reflect on the own role in the course of a project. 1.6. Critically reflects on the own personality and how this influences professional conduct. 1.7. Defines personal learning goals (based on project/work requirements) and guides personal development to reach learning goals.
2	Designing strategies for applied research and product development	2.1. Is able to independently acquire knowledge in a new subject by consulting specific literature and other resources; is able to identify reliable and suitable sources; Discriminates between major and side issues 2.2. Combines information from different sources in the context of the own project 2.3. Defines the project aim in terms of products and/or results based on the acquired background information 2.4. Defines the quality requirements for products and processes based on legal requirements. 2.5. Designs different approaches that could lead to the project aim. Evaluates these possibilities and justifies the choice based on scientific arguments and practical parameters such as time, costs, quality and personnel 2.6. Designs a complete strategy leading to the project aim (project of about 3-4 months; see also: managing projects) 2.7. Identifies opportunities to patent products, results and strategies.

Nr.	Exit qualification	Description
3	Design, analysis and control of experiments	3.1. Designs experiments based on the required quality and quantity of the product or result. 3.2. Applies strict logical thinking to draw conclusions from the results and interprets them: - in the context of the experiments - in the context of the project aim (helicopter view) - in comparison to other analyses, reference/theoretical values, and quality requirements. 3.3. Solves practical problems if experiments do not work as planned (trouble shooting); couples back to the theory or consults colleagues if necessary; suggests alternative experiments.
4	Communication	4.1. Reports project plans and results according to the standard format of scientific documents and meets the scientific international conventions criteria 4.2. Presents project plans and results in English to colleagues, other researchers in the field or to clients. The presentation is at a level equivalent to a presentation at an international symposium 4.3. Describes the key message of the project relevant for patenting, registration, and/or business development. Uses terminology that is understandable for experts from different departments 4.4. Organises and moderates meetings 4.5. Contributes to the efficiency of meetings by being prepared and actively participating 4.6. Keeps client and project members informed about project progress at all stages, especially when the project is not progressing as planned 4.7. Shows initiative to adapt communication styles to the others and the situation at hand.
5	Managing projects	Takes responsibility for a project by: 5.1. Defines project deliverables based on the needed quality and quantity 5.2. Identifies project risks based on the (experimental) approach and on (putative) competitors 5.3. Defines project exclusions 5.4. Organizes the project in phases and defines decision points/ milestones 5.5. Describes the project organisation including the responsibilities of all project members 5.6. Writes a communication plan concerning all project members and parties involved 5.7. Describes a schedule based on the (experimental) plan 5.8. Describes the required budget 5.9. Performs his/her responsibilities 5.10. Approaches others if they do not perform to their responsibilities 5.11. Sets priorities and works efficiently towards the defined project aim/deliverables 5.12. Is in control of the project during all phases by being pro-active if the project does not run according to the plans and initiating an alternative strategy 5.13. Is flexible with changing circumstances by adapting the experimental, project and/or communication strategy 5.14. Obtains the deliverables in time and with the described resources; if not, reasons and justifies the decisions that have been taken in the course of the project.
6	Advising	6.1. Actively involves different specialist to collect advise contributing to the progress of the project. 6.2. Actively participates in a discussion about related projects by asking critical questions and suggesting follow-up experiments. 6.3. Advises about follow-up projects of the own project. 6.4. Integrates own project results in the multidisciplinary defined goals and advises other departments 6.5. Gives advice about choosing new equipment or methods based on project goals, overall goals and available resources

The level of the exit qualifications is geared to The Dublin descriptors.

As a result, our degree programmes are guaranteed to be at the correct national and international level. The degree

certificates meet all legal requirements and are therefore comparable with and equal to similar degree certificates from other universities of applied sciences in the Netherlands and abroad.

Relation between the EQF descriptors and the competences matrix

	Professional conduct and guiding professional development	*Designing strategies for applied research and product development*	*Design, analysis and control of experiments*	*Communication*	*Managing projects*	*Advising*
- have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with Bachelor's level, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context;		x	x			x
- can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study;		x	x		x	x
- have the ability to integrate knowledge and handle complexity, and formulate judgements with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgements;	x	x	x		x	x

- can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously;				x		x
- have the learning skills to allow them to continue to study in a manner that may be largely self-directed or autonomous.	x					

Relation between the competences and examinations (modules in bold):

	Professional conduct and guiding professional development	Designing strategies for applied research and product development	Design, analysis and control of experiments	Communication	Managing projects	Advising
Fundamentals						
Exam			x			
Drug Discovery and Development						
High-throughput analysis		x	x	x		
Drug Discovery poster presentation		x	x	x		x
Fundamentals of Pharmaceutical Chemistry		x	x	x		
Structure Elucidation Analysis			x			
Production of Biomolecules, part 1						
Strategy for microbial oil production (presentation)		x	x	x		x

Production of Biomolecules, part 2						
Technical document		x	x	x	x	
Vaccines and Diagnostics						
Vaccine proposal		x	x	x	x	x
Business plan for development and validation of diagnostic test		x	x	x	x	x
Research and Product Development, part 1						
Scientific document		x	x	x		
R&D presentation				x		
Research performance 1		x	x		x	x
Design of Experiments		x	x	x		
Scientific Progress report			x	x		
Research and Product Development, part 2						
Research performance 2		x	x		x	x
Assignment on Quality regulations		x		x		
Project management, part 1						
Professional conduct including network analysis	x			x	x	
Project proposal		x	x	x	x	
Project management, part 2						
Professional effectiveness	x			x	x	
Reflection on realization of proposal and own contribution	x				x	
Graduation project						

Project Proposal		x	x		x	
Report		x	x	x		x
Portfolio Assessment	x	x		x	x	x
Workplace Assessment	x	x	x	x	x	x

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5 Academic calendar

This chapter outlines the lecture days, lecture times and the holidays and lecture-free weeks.

5.1 Lecture days and lecture times

The HAN timetable is published on HAN Insite.

Regular tuition day of the programme is Monday. Not every Monday is scheduled as contact day. In addition, a complete week of lectures and course activities are scheduled in November of the first year.

The dates of the course-specific holidays, contact days and deadlines for assignments are provided as a preliminary year schedule at the beginning of the course.

The definitive dates, including lecture times and exact deadlines for assignments are provided at least two weeks prior to each module in the detailed module schedule.

In addition to the contact days at HAN, full-time students spend 3 (first 1.5 years of the study programme) to 5 (final 0.5 year of programme) days a week at their internship placement to complete their workplace learning modules. The exact days and times are set in agreement with the placement supervisor.

5.2 Holidays and lecture-free weeks

The calendar for this academic year can be found on HAN Insite. It gives the lecture weeks and holidays.

The lecture weeks and holidays indicated in the calendar for this academic year on HAN insite can deviate from the lecture weeks and holidays of this degree course. Please consult the year schedule of the degree programme.

6 HAN organisation

This chapter gives information about the organisation of HAN. Here you also find information on participation, quality assurance and the facilities you as a student can use.

6.1 Schools

At HAN, the degree programmes are divided over 14 schools.

Your degree programme belongs to School of Applied Biosciences and Chemistry.

Below is a list of all the schools.

School	Academie (NL)	Abbreviation
School of Allied Health	Academie Paramedische Studies	APS
School of Applied Biosciences and Chemistry	Academie Toegepaste Biowetenschappen en Chemie	ATBC
School of Built Environment	Academie Built Environment	ABE
International School of Business	International School of Business	ISB
School of Business and Communication	Academie Business en Communicatie	ABC
School of Education	Academie Educatie	AE
School of Engineering and Automotive	Academie Engineering en Automotive	AEA
School of Finance	Academie Financieel Economisch Management	AFEM
School of Health Studies	Academie Gezondheid en Vitaliteit	AGV
School of IT and Media Design	Academie IT en Mediadesign	AIM
School of Law	Academie Rechten	AR
School of Organisation and Development	Academie Organisatie en Ontwikkeling	AOO
School of Social Studies	Academie Mens en Maatschappij	AMM
School of Sport and Exercise	Academie Sport en Bewegen	ASB

6.2 Management and organisation of the school

On HAN Insite you can find information about the set-up, organisation and staff of your degree programme, and about the school they belong to.

6.2.1 Board of examiners and examiners

The members of the board of examiners can be found on: https://www1.han.nl/insite/international/programs/bachelor/chemistry/fulltime/exams-and-board-of-examiners/

You can contact the board of examiners for your degree programme via the board of examiners secretarial office examencommissie.atbc@han.nl

The members of the board of examiners are appointed by the HAN Executive Board.

The tasks and responsibilities of our board of examiners can be found in the Regulations of the Board of Examiners. These include additional rules regarding final assessment and examination in so far as these are within the powers of the board of examiners. See also the Regulations of the Board of Examiners in Part 3 of this degree statute.

The board of examiners decides, amongst other things, whether you meet the conditions set out in the education and examination regulations.

The board of examiners appoints examiners for each exam and modular exams. One or more appointed examiners administer that exam or modular exam and determine the result.

Other duties and powers of the board of examiners include:

- Assuring exam quality.
- Granting exemptions.
- Handling requests for an extra opportunity for an exam or a modular exam.
- Handling requests for modified exam or modular exam formats.
- Handling complaints.

You can find all the further rules on exams, modular exams and the final assessment that apply to you in the education and examination regulations (see Part 2). For rules on how these are organised, please refer to the Exam Regulations (see Part 3).

6.2.2 Participation and consultation

Below is a short overview of the HAN committees and councils. They discuss and also influence the policies and decisions made at HAN.

Degree committee

There is a degree committee for each degree programme or group of programmes. A degree committee consists of an equal number of staff members and students. The degree committee advises the course department about promoting and guaranteeing the quality of the degree programme. Each year it also evaluates the degree programme's compliance with the education and examination regulations. The degree committee also has a right of consent and advisory rights. Through this committee, you can contribute ideas and make decisions about the education and organisation of your degree programme.
Would you like to become a member of the degree committee? You can request more information from opleidingscommissie-mmls.atbc@han.nl. The degree committee has its own regulations (see Part 3).

School council

Each school has its own school council. This council has the right to discuss all matters concerning the school and to ask the dean about these matters. The council also has the right to be consulted on school policies. The school council gives you the opportunity to contribute ideas and decide on school policies.
Would you like to know more about the school council? Contact the school council secretarial

office: academieraad.atbc@han.nl

Participation council

The participation council allows staff and students to participate at HAN level. This council has a right of consent on certain aspects of policy, on the main features of the institution budget, the general applicable part of the education and examination regulations and more. The participation council has an equal number of students and staff. The participation council deals with general HAN policy.
Would you like to join the participation council? You can ask for more information from the secretarial office for the participation council: secretariaat.mr@han.nl. Would you like to learn more about the participation council? Go to https://www.han.nl/over-de-han/organisatie/bestuur/medezeggenschap/index.xml

6.3 Student facilities

As a student, you can rely on good coaching and guidance during your academic career. Within your degree programme, you and your study coach look at what coaching you need, your study progress and your career development. We look at your talents, ambitions and support needs.
In addition to the coaching offered within your degree programme, you can use the services offered by HAN Student Support Centre. This is a team of experts who work together on one goal: your growth as a student.

On hanuniversity.com, under the 'Study and living' tab, you will find all information about the facilities that are offered in- and out-of-school. The right of students to the various facilities is regulated in section 3.1 of the Student Charter. The various contact details are included in chapter 5 of that statute. The Student Charter can be found at: hanuniversity.com

The main facilities are briefly summarized below. For more information about these facilities, see HAN University of Applied Sciences - Open up new horizons .

SUPPORT

HAN Student Support Centre

All HAN students can contact HAN Student Support Centre for support, advice, training and coaching. This is a network of experts in various areas of student supervision. They have expertise in:

- Study skills, language skills and personal development.
- Degree transfers and study delays.
- Psychological support.
- Student finance, support funds and support and questions about finances.
- Studying with special circumstances, chronic illness or pregnancy.
- Course selection and further studies.
- Various statutory and university of applied sciences regulations.
- Complaints, objections and appeals procedures.
- Studying as an elite athlete.
- Purpose and spirituality.

HAN Language Centre

HAN Language Centre can help you with all your language and translation needs. You can also sign up for various language courses, coaching sessions or workshops. HAN students receive a discount on all foreign language courses.
At HAN Language Centre you can also take a writing or spelling course. There is also a special course (in Dutch) for

students with dyslexia. The courses are intended for both Dutch and international students.

Confidential counsellors

At HAN we treat each other respectfully. Unfortunately, incidents can occur in which you as a student or staff member has to deal with unacceptable and/or disruptive behaviour. If this happens, contact one of the confidential counsellors to discuss what you can do about it. You can choose which confidential counsellor you speak to. More information and the contact details of the confidential counsellors can be found on HAN Insite.

Complaints and Disputes Office

Do you have a complaint, dispute, objection or appeal? The first step is to try to work it out together, possibly with the support of the study coach. If this does not help, you should submit your complaint to the Complaints and Disputes Office. The Complaints and Disputes Office ensures that complaints and letters of appeal are delivered to the right persons within the HAN organisation. The office also takes care of the secretarial duties of the Examination Appeals Board.
E: Bureau.klachtengeschil@han.nl
T: 026-3691504
A: Verlengde Groenestraat 75 Nijmegen / Postbus 6960, 6503 CD NIJMEGEN
I: Klacht en bezwaar (han.nl)

INFORMATION FACILITIES

Student Affairs Enquiry Desk via ASK@han.nl
Do you have questions about your degree programme? For example, about enrolment, payment of tuition fees, examinations, lecture timetables or OSIRIS? You can ask the staff at the Student Affairs Enquiry Desk via ASK@han.nl.

Study and Multimedia Centres

The Study and Multimedia Centres offer a physical library collection at diverse HAN locations. The locations also have places to study and quiet zones.

On the website HAN Study Centres - HAN Study Centres you can find the digital collection, which you can also consult at home. Here you can also find study materials for the Information Skills lessons.

More information about the services, opening hours and contact details can be found on the website of the Study and Multimedia Centres: HAN Study Centres - HAN Study Centres.

HAN Information Centre via ASK@han.nl

The staff at the HAN Information Centre can tell you everything about degree courses, forms of collaboration, promotional activities and the organisation of the entire HAN.
I: Contact form (hanuniversity.com)

International Office

HAN is also active internationally. The activities are extremely varied. For example, the International Office works on internationalisation of the curriculum, expanding the international network of partner universities, studying abroad for HAN students and lecturer exchanges. The International Office also coordinates HAN's efforts in three important internship projects for community work in South Africa, India and Curacao. Finally, the International Office offers practical support regarding scholarships (including Erasmus+) and filling in forms such as the Learning Agreement.

The International Office is also the first point of contact for international students. The International Office is located in Arnhem (Ruitenberglaan 31) and Nijmegen (Kapittelweg 33). Drop by to ask your questions or visit the Insite page of the International Office.
I: International office (hanuniversity.com)

OTHER FACILITIES AND SERVICES

Sports facilities

As a HAN student you can purchase a sports card. This allows you to use the sports facilities of HAN Seneca (the HAN centre for sport and health), the sports facilities of the Arnhem council and the sports facilities of Radboud University Nijmegen.

HAN Employment

HAN Employment mediates between employers and jobseekers doing a work-study or part-time degree course.
HAN Employment also publishes vacancies for alumni.
HAN Employment offers companies the opportunity to post vacancies on the job bank.
Students doing work-study and part-time degree courses are offered training sessions (SollicitatieBoost) and network sessions (Meet & Match).

Entrepreneurship

Students with entrepreneurial ambitions can come here for coaching/starter supervision, entrepreneurship education, help in applying for financing, networking and entrepreneurial events.
You can also contact the centre about doing an internship or graduation assignment in your own company. And HAN offers various minors on entrepreneurship.

Health and safety for students

Would you like to know more about the rules for safe and healthy work practices at HAN? Or do you want to know which resources we have in this area? Visit the special health and safety pages for students on Insite.

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PART 2 Education and Examination Regulations

HAN_UNIVERSITY OF APPLIED SCIENCES

1 About the education and examination regulations

These education and examination regulations are included in the degree statute that applies to your degree programme. The education and examination regulations are adopted each academic year.
The education and examination regulations cover the education, exams, modular exams and final assessment for your degree programme and your rights and obligations.

1.1 Terms and definitions

The terms and definitions used in these education and examination regulations are given below.

The Dutch term is given between brackets.

Academic year (*Studiejaar*)	The period starting on 1 September and ending on 31 August of the following calendar year.
Assessment criteria (*Beoordelingscriteria*)	Clearly defined and unambiguous standards that can be used to give a motivated assessment of whether and to what extent a student meets the required level of knowledge, understanding and skills and (if relevant) attitude assessed in an exam or modular exam.
BRIN number (*BRIN-nummer*)	The Basisregistratie Instellingen (BRIN) is a database for educational institutions that is published by the Dutch Ministry of Education, Culture and Science. It contains all schools and related institutions. Each educational institution is identified in the database with a number. The BRIN number for HAN is 25KB.
Course *(Cursus)*	The term “Course” refers to a unit of study or a unit of learning outcomes and is used for all types of education and corresponding educational concepts.
Credit *(Studiepunt)*	Official term: Education Credit (EC). The study load of a course is measured in credits. For degree programmes that consist of courses one credit equals a normative study load of 28 hours of study. For degree programmes that consist of units of learning outcomes a credit expresses the comparative study load of a course compared to the study load of the degree programme.…..
CROHO (*CROHO*)	CROHO is the central register for degree programmes in higher education.
Degree committee (*Opleidingscommissie*)	The statutory public participation body as referred to in article 10.3c of the Higher Education and Research Act, which is responsible for eg. guaranteeing the quality of the degree programmes listed in Part 2, chapter 1.
Degree format (*Inrichtingsvorm*)	The manner in which a degree programme is organised: full-time, part-time or work-study.

Deregister (*Uittekenen*)	Sign out of participation in educational activities, exams and modular exams after registering.
D-stream (*D-Stroom*)	This is a customised study programme that has the same exit qualifications and assessment criteria for courses as the regular stream (A-stream). It allows a student to following their own study track in continuous consultation with examiners, lecturers and classmates.
Educational arsenal *(Onderwijsarsenaal)*	The educational and coaching activities offered to students by a unit of learning outcomes programme with the aim of supporting the student in gaining the course exams and exam modules.
Elective course (*Keuze-cursus*)	A course that can be chosen from two or more courses. Once selected, a course becomes part of the student's study programme and final assessment. The exams and modular exams for the non-mandatory courses that the student did not select do not need to be taken for the degree certificate.
Exam (*Tentamen*)	A test of the student's knowledge, understanding, skills and (if relevant) attitude in conjunction with each other. Also, the assessment of the results of that test. The exam is the concluding component of a course .
Exam opportunity (*Tentamengelegenheid*)	An opportunity offered in the degree programme to sit for an exam or modular exam.
Exam sitting (*Tentamenmoment*)	The sitting/time at which an exam or modular exam is administered/held.
Examination Appeals Board (*College van Beroep voor de examens*)	This is the board referred to in article 7.60 of the Higher Education and Research Act. The board deals with appeals submitted by students against decisions made by HAN.
Exams taken independently of the standard programme (*Leerwegonafhankelijk tentamen*)	An exam or modular exam that the student can take without having participated in the educational activities linked to that exam or modular exam.
Exemption (*Vrijstelling*)	A decision made by the board of examiners that a student does not have to take the exam(s) relating to one or more specific courses. This decision is based on the board's opinion that the student already sufficiently masters the required knowledge, understanding, competences and/or skills and (if relevant) attitude.
Exit qualifications (*Eindkwalificaties/Eindtermen*)	Well-defined outcomes regarding the knowledge, understanding and skills and (if relevant) the attitude a student should acquire by the time they complete their degree programme.
External student (*Extraneus*)	A person enrolled at a university of applied sciences or university who can participate in exams, modular exams and final assessments but not in the education or supervision.
Graduation specialisation (*Afstudeerrichting*)	A specialisation within a degree programme as defined in the education and examination regulations.

HAN (*HAN*)	HAN University of Applied Sciences. This abbreviation is used in internal documents to improve the readability of documents.
Head examiner (*Hoofdexaminator*)	Appointed by the board of examiners as the head examiner responsible for the results of examination and assessment in cases where more than one examiner has been appointed for an exam or modular exam.
Higher Education and Research Act (*WHW*)	Higher Education and Research Act (in Dutch: *Wet op het Hoger Onderwijs en Wetenschappelijk Onderzoek*).
Honours programme (*Honoursprogramma*)	A specialisation or differentiation programme for students who are capable of and want to do more than what is offered in the regular study programme. An honours programme has an additional study load of 22.5 credits or more.
Learning outcome (*Leeruitkomst*)	Learning outcomes are what a student knows, understands and is able to apply after a period of study (NVAO 2019). Learning outcomes are derived from exit qualifications and are linked to professional practice.
Major (*Major*)	The core 210 credits of a bachelor degree programme. During the major a student acquires the qualifications needed to graduate for a university of applied sciences bachelor degree and meet the professional requirements.
Minor (*Minor*)	The part of the post-propaedeutic phase of the bachelor degree programme that is aimed at specialisation or differentiation. The minor has a study load of 30 credits.
Model degree statute *(OER)*	Education and examination regulations.
Module (*Module*)	An internally coherent and to some extent independent part of the part-time and work-study degree programme. A module consists of one or more courses and is aimed at a realistic cluster of qualifications derived from professional practice.
Module certificate (*Modulecertificaat*)	Written statement by the board of examiners that a student has successfully completed a module in the part-time or work-study degree format.
OSIRIS	The HAN student information system.
Premaster (*Premaster*)	Opportunity to resolve deficiencies when failing to meet the admission requirements of master degree programmes
Professional requirements (*Beroepsvereisten*)	Well-defined qualifications regarding the knowledge, understanding and skills and (if relevant) the attitude a student needs to carry out the profession they are studying for.
Professional task (*Beroepstaak*)	A meaningful, complete task as carried out in all its complexity by a professional practitioner in an actual professional setting with all its complexities.

Recognition of Prior Learning (*Erkenning Verworven Competenties, EVC*)	Recognition of prior learning gained outside the degree programme that leads to a Certificate of Prior Learning from the Nationaal Kenniscentrum EVC, the national research centre for the recognition of prior learning. Recognition of prior learning can lead to exemption from exams and modular exams for courses that focus on the competences already gained through the prior learning.
Register (*Intekenen*)	Registering for participation in educational components, exams and modular exams in OSIRIS.
School (*Academie*)	An organisational unit with interconnected degree programmes, research and knowledge services.
Student (*Student*)	A person enrolled as a student in a degree programme at HAN with the aim of participating in education, exams and modular exams.
Tutor (*Studentbegeleider*)	A staff member responsible for the study coaching of one or more students.
Study load *(Studielast)*	The time and effort required for a course.
Study plan *(Studieplan)*	The contract between a student and HAN at courses that consist of units over learning outcomes. Also called the education contract.
Study progress requirement (*Studievoortgangsnorm*)	The standard that the course department sets and that the student must meet in order to receive positive study advice.
Talent programme (*Talentenprogramma*)	A specialisation or differentiation programme for students who are capable of and want to do more than what is offered in the regular study programme. A talent programme has an additional study load of fewer than 22.5 credits.
Track with special feature (*Traject met bijzondere eigenschap*)	A degree track that distinguishes itself from the standard track because of a different duration, intensity, language or format. In all cases, the study load and the qualities in the area of knowledge, understanding and skills that a student has to acquire by the end of the track are the same as those of the degree programme.
Unit of Learning Outcomes *(Eenheid van leeruitkomsten)*	A measurable result of learning outcomes that a student may gain without having participated in the educational activities linked to said learning outcomes, the command of which the student is able to demonstrate independently of regular in-class educational activities. A unit of educational outcomes comes with a final examination that may consist of more than one module of exams. In the model degree statute a unit of learning outcomes is called a course.
Unit of study / study unit (*Onderwijseenheid*)	A basic unit of HAN education that is aimed at achieving clearly defined objectives in terms of knowledge, understanding, skills and (if relevant) attitude. These are assessed in an exam and awarded a certain number of credits.

Workplace learning agreement *(Praktijkleerovereenkomst)*	Agreement between HAN, the student and a company or organisation regarding work-study placement in the part-time or work-study courses as described in article 7.7,

1.2 Which degree programme(s) do these education and examination regulations apply to?

These are the education and examination regulations, as defined in article 7.13 of the Higher Education and Research Act, for the following HAN degree programme(s):

Degree programme	Degree format	CROHO number	Location of the degree programme
M Molecular Life Sciences		49293	Nijmegen

1.3 Which education and examination regulations apply to you?

At HAN, the education and examination regulations are renewed every year. This does not mean everything changes each year. Generally only a small number of changes are made to the educational programme and the organisation.

These education and examination regulations apply to the 2024-2025 academic year, so from September 2024 to 31 August 2025.

Amendments made to the education and examination regulations do not apply to events or matters in the past, but only to the new academic year. Special rules may apply when switching from 'earlier' education and examination regulations to new education and examination regulations. These rules can be found in the transition regulations: Part 2, chapter 8.

In exceptional cases the education and examination regulations must be amended during an academic year. Amendments can only be made during an academic year if this is reasonably necessary and does not disadvantage the students. Transition regulations may also apply in these cases: see Part 2, chapter 8. The overview of adopted amendments is included in Part 2, section 8.5.

In cases not provided for in these education and examination regulations, the dean will decide. If a case is subject to the authority of the board of examiners, a decision will be made by the chair of that board of examiners. Those with an interest in the decision will be informed of that decision within four weeks.

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2 Regulations concerning admission

The rules concerning application, admission, admission requirements, selection and enrolment for all degree programme(s) to which this degree statute applies, can be found in the Enrolment Regulations:School of Applied Biosciences and Chemistry.

This chapter contains the applicable rules for admission into the degree programme, which by law must be included in the education and examination regulations.

2.1 Maximum number of admissions

Not applicable

2.2 Admission requirements

A requirement for admission to a master degree programme is holding a bachelor degree from a university of applied sciences or university or possessing knowledge, understanding and skills at the level of a bachelor degree from a university of applied sciences or university.

The following specific requirements also apply to this degree course:

- Bachelors degree in the field of molecular life sciences (molecular biology, cell biology, biochemistry) or having the equivalent knowledge, understanding and skills according to the enrolment regulations,

- Professional use of English (B2 level of English according to the Common European Framework of Reference recommended)

- Practical lab research experience in the field of molecular life sciences during or after the bachelors course of at least 5 months.

If the applicant is unable to submit a degree certificate or other documents demonstrating that he or she meets the entry requirements, he or she may take an admission test to demonstrate that he or she meets the entry requirements.

2.3 Employment requirements for part time degree programme(s)

If you do the part-time format of this degree course, there are certain employment requirements. Those requirements also apply if you are self-employed. The units of study to which this applies to research and product development skills 1 & 2 and managing projects 1 & 2.
Those requirements are further detailed in the Enrolment Regulations and are included in the descriptions of the units of study in Part 2, chapter 6.

2.4 Workplace-learning agreement for the work study degree format

Not applicable

2.5 Study plan

Not applicable.

2.6 Extra contribution

Not applicable

3 Description of the degree programme

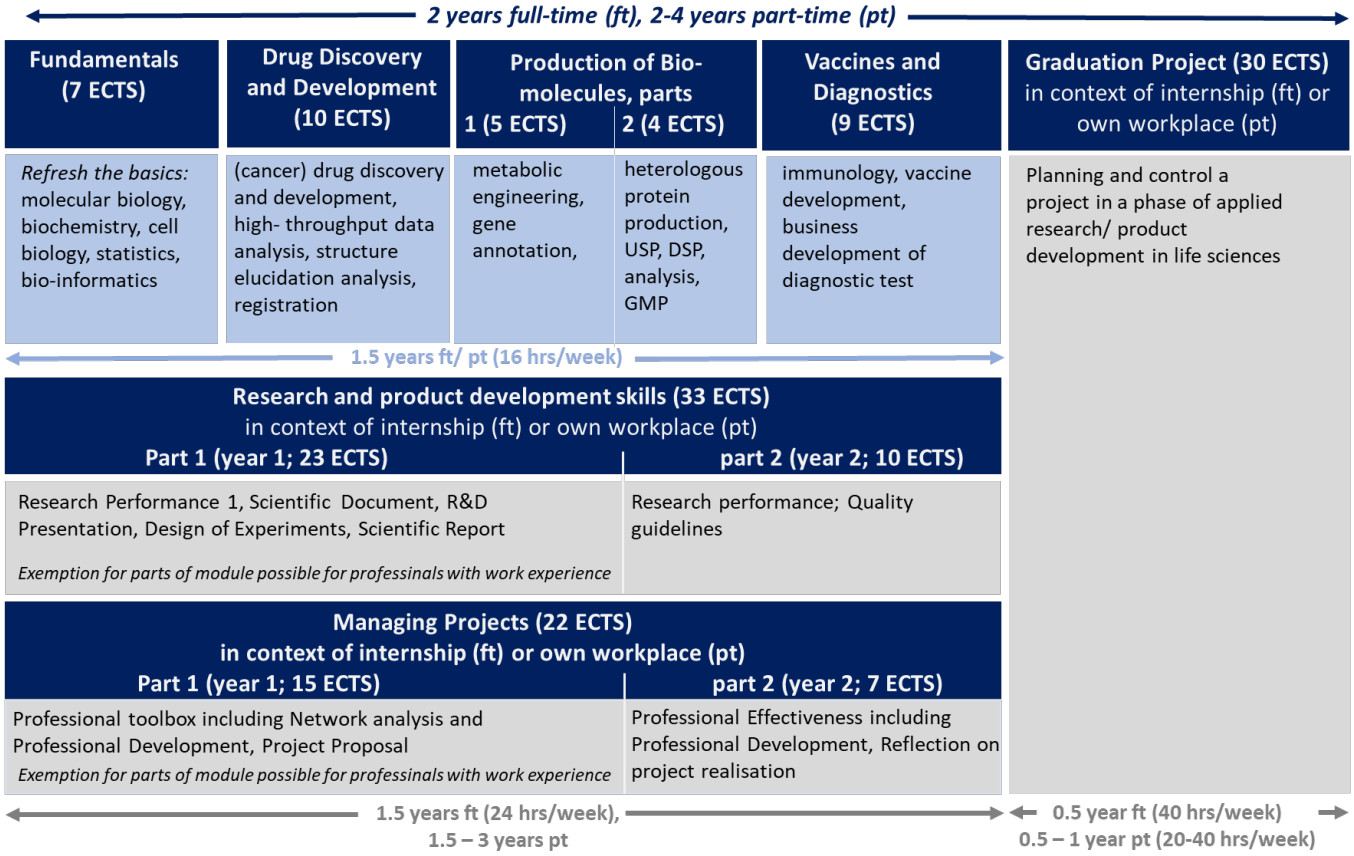
In this chapter you can read about the format and structure of the degree programme. You can also read about the study load of the different courses or modules offered in the degree programme. This chapter contains a general description. Part 2, chapter 6 describes the exact content of the degreeprogramme.

3.1 Structure and format of the degree programme.

3.1.1 Structure of the degree programme

The degree programme consists of a coherent set of courses. In the part-time and/or work-study degree format, courses are grouped in modules.

In schematic form your programme looks like this. For the numbering of the exit qualifications, see Part 1, Chapter 4 The exit qualifications for your programme and professional requirements.



The study load of a degree programme is represented in credits. The study load of a course is at least one credit. One credit is equal to 28 hours of study (this is an average indication). The study load of this master degree programme is 120 credits.

Each year of study is structured so that the standard study load for a full time degree format is 60 credits.

The standard study load of the part time-degree programme is 60 credits per year of study.

You can follow the degree programme in the following degree formats:

Full-time

Part-time

At location: Nijmegen.

The standard scheduled duration of the degree course is 2 years of study.

The part-time degree format has a standard scheduled duration of minimally 2 years of study.

The structure of the educational programme for this degree programme is provided in Part 2, chapter 6.

3.1.2 Structure of the work-study degree format
The credits for the work-study degree programme are structured as follows:

- 45 credits for the educational component of the degree programme; and
- 75 credits for learning and performing tasks in the professional field.

The agreements between the student, employer and HAN are laid down in a workplace-learning agreement that is drawn up according to the model that is established by HAN and complies with article 7.7 of the Higher Education and Research Act.

3.1.3 Elective courses
Not applicable

3.1.4 Graduation specialisation
Not applicable

3.2 Tracks with special features

Not applicable

3.2.1 Combined track
Not applicable

3.2.2 Other track with special feature
Not applicable

3.3 Language in which the courses are offered

The degree programme Master Molecular Life Sciences is offered in English.

3.4 Extra educational components

As a student you can take one or more extra modules or courses at HAN. If you choose to do this, you will be expanding your study load. You can do this at HAN by:

- taking one or more extra modules,
- taking one or more extra courses.

You do not need approval from the board of examiners to participate in an extra module or one or more extra courses.

Capacity limits may apply for participation in an extra courses or an extra module.

Extra educational components are not part of the degree programme. The results of extra educational components will be listed separately on the degree certificate.

3.5 If the content or structure of your degree programme changes

We regularly change or update components of the degree programme so we can guarantee the quality of the degree programme and the value of your degree (certificate). This means the education and examination regulations for a following academic year may contain amendments to the course programme you will follow.

Changes to the degree programme can have certain consequences. If you have a study delay, for example, you may need to pass a different exam or modular exam than you initially thought. A change may also mean an exam or modular exam is still offered, but you can no longer follow the educational activities for that particular component.

A change cannot mean that courses or exams and modular exams you have already passed no longer count towards the final assessment. The law only allows this in highly exceptional cases.

The transition regulations in Part 2, chapter 8, stipulate, for every change to the degree programme, where needed, what the consequences are for students who are registered for the study programme at the time of said change. .

3.6 Registering for educational activities

To participate in educational activities you must register for these educational activities. You can do this in Osiris. If you do not register for an educational activity, you may not participate. The only exception to this rule are the educational activities at the start of your degree programme. Your programme will register you for those educational activities.

You can register for educational activities from 20 to 10 work days before the start of the educational activities. After this period you cannot register anymore. After this period you may submit a request for a late registration. If your request for a late registration is granted, you will be registered for the educational activity.

Such a request may be submitted no later than 9.00 AM on the work day before the start of the educational activity. For educational activities at the start of an academic year you may submit a request for a late registration up until and including the last work day of the first educational week.

A request for a late registration will be granted if the educational activity allows such a late registration and if there is no maximum number of students set for the educational activity or if the maximum number of students has not been exceeded.

Deregistering for educational activities is possible until a day before the start of the educational activity at the latest.

4 Study coaching and study facilities

The learning objective and basic principle at HAN is that you take charge of and are responsible for your own learning process.

We want you to feel acknowledged during your entire time as a student. You are entitled to good study coaching. Each degree programme offers support for this. If needed, HAN can also offer you academic, psychological and financial support. The HAN Student Support Centre network offers you support for successful study progress.

4.1 What does HAN offer to assist you with your studies?

HAN offers facilities that enable you to do well in your studies. Examples of these are:

1. Facilities for students with a disability;
2. Facilities for pregnant students and students with informal care tasks;
3. Special support for international students;
4. Special support for students from minority groups.

HAN Student Support Centre also offers support for successful study progress. Students who need this can get extra support. You can contact your Tutor or HAN Student Support Centre for more information about the facilities and coaching offered at HAN. See also Part 1, chapter 6.

4.2 How is study coaching organised?

The study coaching starts with the introduction to the tutor at the start of the academic year. In the first year of study, your personal tutor will invite you to come and talk with them at least 2-4 times. Furthermore, study coaching is integrated in the education in the courses.

General information about study coaching

The aim of study coaching is to support and guide students personally to optimal study success.

Though students work rather independently during their master education, personal attention is an important aspect of the master programme in Molecular Life Sciences. The study is seen as an integral part of the professional and private life of students and adjusted as much as possible to the needs of individuals.

For mastering the competences developed with the modules Research and Development Skills and Managing projects, the context of workplace plays a pivotal role.

Specific elements of study coaching

Study tutoring in the Molecular Life Sciences master course is based on the master level professionals are educated to. Each student has a study coach. Personal discussions of the student, student career coach and workplace supervisor will be scheduled on a regular basis. During these discussions, the competence development, study progress, learning goals and individual needs of students will be discussed. Furthermore, combining study with professional and private life can be subject of these discussions.

Next to the structural discussion, students can always contact their student career coach, lecturers, the programme coordinator or the administrative support (secretary) with specific questions or problems. There is an ‘Open door policy’.

Personal requirements of students are met as much as possible and sensible with respect to the regulations,

practical feasibility and the student’s study progress.

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5 Exams and final assessment

This chapter covers, in general terms, the exams, modular exams and final assessment for your degree programme.

Each course has a related exam**.** An exam can consist of two or more modular exams that have a predetermined weight factor and jointly determine the result for the exam of the course.

5.1 Exams and modular exams

5.2 Exam

The result of an exam for a course is used to determine whether the student has the knowledge, understanding and/or skills and (if relevant) attitude required to successfully complete that course. The learning outcomes and assessment criteria of the exams and modular exams are set out in Part 2, chapter 6.

5.2.1 Entry requirements

Some courses have qualitative entry requirements for participating in educational activities, exams and modular exams for that course. The entry requirements are provided in the course descriptions in Part 2, chapter 6. You can submit a well-reasoned request to the board of examiners for permission to deviate from these entry requirements.

The following entry requirements may apply to your degree programme:

- You need to have passed one or more other specific exams or modular exams.
- You need to sufficiently master the language in which the course is taught.

5.2.2 Mandatory participation

In some cases you may only sit an exam or modular exam if you have actually participated in the educational activities for the course belonging to that exam or modular exam.

Part 2, chapter 6, further stipulates which courses have full or partial mandatory participation.
The board of examiners may grant full or partial exemption of mandatory participation. In that case, an equivalent requirement is imposed.

For your degree programme participation in educational activities for certain exams and modular exams is mandatory as participation in some cases is part of the performance assessments.

5.2.3 Exam format

The format of an exam or modular exam is specified in Part 2, chapter 6, in the description of the course concerned. The board of examiners may deviate from this format in special cases, on request or at their own initiative.

The following exam formats can be used:

Format	Description
GESP-F	Meeting on location
GESP-O	Online/digital meeting
KENN-F	Knowledge exam on location/written

KENN-M	Oral knowledge exam
KENN-O	Online/digital knowledge exam
PART-F	Participation on location
PART-O	Online/digital participation
PERF-F	Performance on location/written
PERF-O	Online/digital performance
PORT-F	Portfolio on location/written
PORT-O	Online/digital portfolio
PRES-F	Presentation on location
PRES-O	Online/digital presentation
PROD-F	(professional) Product on location/written
PROD-O	Online/digital (professional) product

Oral examinations are public. The exam commission may, in special cases, deviate from this rule. This decision will be communicated with a motivation to all interested parties.

5.3 The examiner

Each exam and modular exam is assessed by one or more examiners, as decided and appointed by the board of examiners.
The examiner determines the outcome of the exam or modular exam and the result. If more than one examiner is appointed, the head examiner sets the final result.

5.3.1 When have you passed an exam?
The examiner gives the result of an exam as a grade, a word qualification or a pass/fail qualification.
The **grade** of an exam is expressed in one of the following numbers: 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10.
A **word** qualification can be given in one of the following terms: outstanding, good, more than satisfactory, satisfactory, almost satisfactory, unsatisfactory, poor.

The conversion chart below must be used:

Word qualification	**Abbreviation word qualification**	**Conversion**
Outstanding *(excellent)*	O	10
Good *(goed)*	G	8

More than satisfactory (ruim voldoende)	MS	7
Satisfactory *(voldoende)*	S	6
Almost satisfactory *(onvoldoende)*	AS	5
Unsatisfactory *(ruim onvoldoende)*	U	4
Poor *(slecht)*	PR	2

You have passed an exam if you receive a grade of 6 or higher, a word qualification of satisfactory or higher or a Pass.

You have failed an exam if you receive a grade of 5 or lower, a word qualification of almost satisfactory or lower or a Fail.

In the course descriptions in Part 2, chapter 6, is described if an exam is graded with a grade, a word qualification or a pass/fail.

In the case of fraud, an F is recorded for the exam result in OSIRIS.

5.3.2 When have you passed a modular exam?
The examiner gives the result of a modular exam as a grade, a word qualification or a pass/fail qualification as described in art. 5.3.1. The same conversion chart applies.
A grade for a modular exam is rounded to a number with 1 decimal place.
Grades with the decimals 1, 2, 3 or 4 are rounded down.
Grades with the decimals 5, 6, 7, 8 or 9 are rounded up.

You pass a modular exam if you earn a grade of 5.5 or higher, a word qualification of satisfactory or higher or a 'pass' qualification.
You fail a modular exam if you earn a grade of 5.4 or lower, a word qualification of almost satisfactory or lower or a 'fail' qualification.

In the course descriptions in Part 2, chapter 6, is described if a modular exam is graded with a grade, a word qualification or a pass/fail.

In the case of fraud, an F is recorded for the modular exam result in OSIRIS.

5.3.3 How is the overall grade calculated for an exam with modular exams?
When the overall grade for the exam is calculated, the grades earned for the modular exams are weighted as specified in the course descriptions given in Part 2, chapter 6. In case of word qualifications the conversion chart above applies. The final exam grade is then rounded as follows:

Exam grades with the decimal 1, 2, 3 or 4 are rounded down to whole numbers.
Exam grades with the decimal 5, 6, 7, 8 or 9 are rounded up to whole numbers.

5.3.4 Applicable result

The final grade for an exam or modular exam is the highest grade achieved. You are allowed to resit an exam or modular exam even if you pass it.

The unit of study descriptions in Part 2, chapter 6, stipulate whether compensation regulations for exams and modular exams apply.

5.4 How often can you take an exam or modular exam each academic year

All degree programmes must allow you the chance to take an exam or modular exam at least twice in each academic year. The degree programme may conduct an exam or modular exam more than twice each academic year. The descriptions of the courses in Part 2, chapter 6, specify how many exams and modular exams are conducted each academic year and in which term. In case the degree programme conducts exams or modular exams more than twice in an academic year, the degree programme decides how often they are conducted. Your degree programme allows you to sit exams and modular exams at most 2 times per academic year.

In the following exceptional situations, the course description in Part 2, chapter 6, may stipulate that fewer opportunities than mentioned above will be offered each academic year for students to take the exam or modular exam. This may occur in the following situations:

- the nature of the educational activities and assessment for the course make it impossible. Each academic year at least one opportunity must be given to sit an exam or modular exam,
- physical reasons (such as the use of actors) or logistic reasons (such as the inability to offer an extra opportunity at the end of the academic year) make an extra opportunity impossible.

The student will be informed of this exception when they apply for the course and, if possible, before the start of the academic year.

5.4.1 Registering for exams and modular exams

To participate in exams or modular exams you must register for these exams or modular exams. If you do not register for an exam or modular exam, you cannot participate in it. The only exception to this rule are the exams and modular exams that take place in the first month after the start of your programma. Your programme will register you for those exams and modular exams.

You can register for exams and modular exams from 20 to 10 work days before exam or modular.

After this period you cannot register anymore. After this deadline you may submit a request for a late registration.

Such a request may be submitted no later than 9.00 AM on the work day before the exam or modular exam. A request for a late registration will be granted if it is your last modular exam before an exam or if an exam is conducted for the last time before a change in the degree curriculum. A request for a late registration will not be granted if it is impossible to arrange for the necessary resources, facilities or support.

If you have registered for an exam or modular exam but do not wish to take the exam or modular exam you must deregister for the exam or modular exam. Deregistering for an exam or modular exam is possible up to and until a work day before the exam or modular exam is conducted. If you don't deregister and don't participate in an exam or modular exam, the examinator will register a ND (niet deelgenomen/did not participate) for you result and you will have used one of your allowed exam or modular exam opportunities.

Should you be unable to deregister on time due to exceptional circumstances you may request an extra exam or

modular exam opportunity to the board of examiners.

5.4.2 Request for extra exam opportunity or different exam format
You can submit a request to the board of examiners for an extra opportunity to sit an exam or modular exam. The request must include a good motivation and at least a description of the reason and importance. In the Regulations of the Board of Examiners (see Part 3) gives further details on the procedure are explained.

5.5 Modified exam format

Do you have a disability or chronic illness, or is there another reason that means you cannot participate in the regular format of the exam or modular exam? Then you can ask the board of examiners to conduct the exam or modular exam in a format adjusted to your situation.

The board of examiners will decide, if needed after consultation with you and the examiner, which format can reasonably be used for the exam or modular exam, which facilities will be offered and which different rules will apply.

5.6 Oral (modular) exam

An oral (modular) exam is a conversation between the examiner(s) and the student. Oral (modular) exams are public. The exam comity may depart from this rule in exceptional circumstances. The decision to do so will be substantiated and communicated to all involved.

5.7 When is the result of an exam announced?

It depends on the exam format when the result of an exam or modular exam is announced:

- You will be informed of the result of a written exam or written modular exam within at least 15 working days. This result will be recorded in OSIRIS.
- The result of an oral exam or oral modular exam will be decided directly after the exam and announced within no more than five days. This result will be recorded in OSIRIS.
- You will be notified of the result of a practical exam or practical modular exam immediately after the exam, or if that is not possible, within five working days. This result will be recorded in OSIRIS.

A result entered into OSIRIS may only be changed in the following cases:

- If a demonstrably incorrect result has been entered into OSIRIS.
- In cases of fraud, deceit or impersonation.
- If an examiner has revised their assessment for well-founded reasons.
- If you have lodged an appeal to the Examination Appeals Board or the Higher Education Appeals Tribunal against an assessment, the appeal is judged to be valid and the result has been revised by the examiner.

Has a result changed after being entered into OSIRIS? Then you will be notified.

5.8 Exams: review and discussion rights

You are entitled to receive further explanation about the assessment of your exam or modular exam. This is set out in the HAN rules on discussion and review rights below. Both the discussion and individual review are closely monitored to ensure no fraud takes place.
Discussion and review rights are organised as follows:

5.8.1 Group discussion

Within 10 working days at the latest after the results of an exam or modular exam are announced the examinator(s), or someone mandated by the examinator(s), will organise a group discussion, unless it is clear that the students don't find this necessary.

5.8.2 Review and discussion of individual work

As an interested party you are entitled to review and discuss your own work with your lecturer and the examiner, unless you could reasonably have already done this during the group discussion. You are allowed to review and discuss everything: the assessed exam or modular exam, the questions, assignments and grading system. Students must have the option to review and discuss their own work within 6 weeks after the result is announced.

Review and discussion of exams will be scheduled within 6 weeks after the results are announced. Review and discussion of individual work is requested by student at the respected examiner.

5.9 Exams taken independently of the standard programme

An exam or modular exam taken independently of the standard programme is an exam you can participate in without following any of the educational offerings of the course. If you would like to participate in an exam or modular exam taken independently of the standard programme, you can submit a substantiated request to the board of examiners. The request must include at least a description of the reason and importance.

The board of examiners will make a reasoned decision based on the evidence submitted within 20 working days.

If this decision is positive, you can participate in the exam or modular exam. If the regular exam or modular exam is not suitable for that, the board of examiners will appoint the examiners and decide on the exam format, in accordance with the relevant exit qualifications and assessment criteria given in Part 2, chapter 6.

5.10 When and how can you request exemption from an exam or modular exam?

Part 2, chapter 6 describes for each exam and modular exam which knowledge, understanding, skills and attitude you need to demonstrate and how they will be examined and assessed. You can request an exemption from the board of examiners for one or more exams or modular exams if you demonstrate that you already master the knowledge, understanding, skills and attitude associated with the exam or modular exam.

You can demonstrate this with:

- evidence showing you previously passed an exam in higher education;
- an official report showing recognition of prior learning;
- evidence that you gained the required knowledge, the required understanding and/or the required skills elsewhere.

The learning outcomes and assessment criteria of the exams and modular exams as specified in Part 2, chapter 6, form the guidelines for the board of examiners to grant the exemption.

Instead of a grade, a word qualification or the 'pass' qualification, you receive the qualification of 'exemption' for an exam or modular exam.

Further rules for granting exemptions can be found in the Regulations of the Board of Examiners (Part 3).

The board of examiners may designate certain previously passed exams and modular exams and/or any previously earned credits and degree certificates as entitling students to exemption from one or more exams or modular

exams.
The designated exams, credits and certificates are outlined in an appendix to the Regulations of the Board of Examiners. The board of examiners may also consider these as grounds for exemptions from one or more exams or modular exams for courses that are part of abridged tracks.

5.11 The final assessment

You pass the final assessment of the master degree programme if you have passed all of the exams related to that final assessment.
This will differ if the board of examiners has specified that an extra assessment is needed of your knowledge, understanding and skills. In that case, you will also need to pass that extra assessment (exam). Only then will you pass the final assessment.

5.11.1 Cum laude

If you pass all the exams that count towards the final assessment with a grade of 8 or higher, you will pass that assessment ‘cum laude’. The grades that count here are the overall exam grades for each course; separate grades for the modular exams are not taken into account.
Exams that have a word qualification will be converted using the table in 5.3.1.

Exams that are part of an increase of your study load, as described in Part 2, chapter 3, are not taken into consideration when determining the 'cum laude' distinction.
You may earn no more than 60 credits in exemptions or 'pass' qualifications in the degree programme.

5.11.2 With merit

If you pass all the exams that count towards the final assessment with a grade of 7 or higher, you will pass that assessment ‘with merit’. The grades that count here are the overall exam grades for each course; separate grades for the modular exams are not taken into account.
Exams that have a word qualification will be converted using the table in 5.3.1.

Exams that are part of an increase of your study load, as described in Part 2, chapter 3, are not taken into consideration when determining the 'with merit' distinction.
You may earn no more than 60 credits in exemptions or 'pass' qualifications in the degree programme.

5.12 Overview of results, supporting documents, and declarations

5.12.1 How to request a - certified - overview of your study results

You can make a printout of your exam results as recorded in OSIRIS. If you want to use this overview as an official document outside HAN, you can submit a request to the Student Affairs Enquiry Desk, via ASK@han.nl for a certified overview of study results. This certification does not guarantee that the relevant authorities will also consider the document official.

5.12.2 Exam documentation

You will receive a digital document from the examiner for each exam or modular exam you take. It gives the name and code of the exam or modular exam, the course and your result. The examiner is required to provide you with this documentation.
Keep these documents in a safe place.

5.12.3 Statement
Are you dropping out of the degree programme and not entitled to a master degree certificate? If you have passed more than one exam, you can ask the board of examiners for a statement listing the exams you passed, for which degree programme, how many credits you earned for those exams and, if applicable, the programme for which the statement is being issued.

5.12.4 Module certificate
You can request a statement from the board of examiners for each module you have passed.
This statement specifies the name of the module, the courses within the module, the accompanying number of credits and the results you earned for the exams.

5.13 Degree certificate, degree and diploma supplement

5.13.1 Master degree certificate and diploma supplement
In the month when you expect to have passed all the exams for the degree programme, you can apply for your certificate through OSIRIS. Only after you apply, does the board of examiners check whether you have indeed passed all exams for the degree programme, whether you are enrolled in the degree programme, and whether you have met all your financial obligations towards HAN.
Following this, the board of examiners will award the degree certificate and the accompanying diploma supplement in English. The official date of graduation is the day the board of examiners determines that you have earned all the required credits.

5.13.2 Degree and degree title
Once the board of examiners has confirmed you have passed the final master assessment, the HAN Executive Board will award you the degree for your degree programme. This degree comes with an official abbreviation you can place after your surname in the Netherlands and abroad.

Degree programme	Degree and degree title	Official abbrevation
Master Molecular Life Sciences	Master of Sciences	MSc

This degree title is also stated on the certificate.

5.13.3 Postponement of the degree certificate
You are allowed to postpone the request for your master degree certificate. The maximum period for a postponement is two years.

5.14 Appeal

You can lodge an appeal with the HAN Examination Appeals Board against a decision concerning education, exams, modular exams and final assessments within 6 weeks based on the education and examination regulations.

For more information about which decisions you can appeal and how, go to HAN Insite Complaints and Disputes Office.

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6 Description of the educational programme

This chapter describes your degree programme.

If extra programmes, tracks in a language other than English or tracks with a special feature are offered, these are also described.
This chapter also specifies whether the degree programme offers modules and/or elective courses.

Name of degree programme: MMLS			
CROHO number: 49293			
Degree format	Full-time	Part-time	
Language	English	English	
Variants and tracks			

6.1 Courses

See Appendix to chapter 6 description of the educational programme.

6.2 Graduation specialisations

Not applicable

6.3 Other

Not applicable

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7 Evaluation of the degree programme

7.1 Evaluation structure

A quality framework has been adopted for all HAN degrees. This is in line with the accreditation framework of the Accreditation Organisation of the Netherlands and Flanders (NVAO) and the education policy formulated by HAN. This framework stipulates, among other things, that regular evaluations must be held among students, graduates, the professional field and staff.

Assessments are also held by HAN to support the evaluations at the level of the degree programme.

Each year all HAN degree programmes participate in the National Student Survey (NSE) in which students indicate how satisfied they are with different aspects of their degree programme.

Every year an alumni survey is held via the HBO-monitor. This evaluates for each degree programme how alumni look back on their degree programme and how well it was geared to the labour market in their experience.

HAN students who leave a degree programme without a degree certificate are contacted to enquire about their reason for leaving. Also, study progress and drop-outs are monitored for each degree programme.

Every six years an accreditation is held by the NVAO, with external reviews beforehand by a committee of experts. Halfway through the accreditation cycle, an audit is conducted by an internal committee complemented by an external expert in the relevant field. The aim is to monitor and test the progress of improvement measures relating to the last external assessment of the degree programme. This internal audit results in a report with improvement recommendations for those responsible for the content of the degree programme, the degree committee and the dean.

The audit is conducted according to HAN guidelines and it includes quality assurance with regards to administrative and educational law and good implementation of the education and examination regulations.

7.2 Evaluation by the degree programme

The core team is responsible for the structure and the quality of the degree programme.

Each year the dean adopts an annual quality assurance report on the degree programme. This document, along with the internal audit report or review report, forms the basis for dialogue about the quality of the degree programme. This report concerns the improvement activities that were agreed on for the reported year, how they were executed and what results they delivered.

Based on the analysis of evaluation data for the reported year, a description follows of the improvement activities to be implemented in the current year. The evaluation data come about through evaluations of courses, annual evaluations and curriculum evaluations by lecturers, students, alumni and the professional field. Also through evaluation studies conducted centrally by HAN.

The dean and/or the degree committee, curriculum committee and the board of examiners are involved in this cycle at degree programme level by means of a brief response to this. Their responses are included in the appendixes to the annual report.

7.3 Role of the degree committee

The tasks, role and responsibilities of the degree committee in the evaluation are set out in the Regulations of the Degree Committee (see Part 3). The degree committee can also take the initiative to conduct specific evaluations.

7.4 Degree-specific quality assurance

Different stakeholders, which are students, professional field (professional advisory committee, the HAN Research group Industrial Microbiology and diverse other contacts), lecturers and alumni are involved in the quality assurance cycle. They are formally asked about their opinion about various quality aspects of the programme on a regular bases, and are stimulated to give informal feedback. Evaluation scores are compared to targets. Possible causes for scores lower than targets are discussed, and improvement actions are initiated, carried out, communicated and evaluated. By continually going through Deming's Plan-Do-Check-Act cycle (PDCA cycle), the programme aims for continuous improvement of the quality of the programme.

In addition, the external supervisor has the task to give feedback on the realization of the final qualifications, their assessment and teaching supporting students in acquiring these.

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8 Transition regulations

8.1 Effective date for amendments

An amendment to the education and examination regulations can only become effective as of 1 September in the following academic year. Exceptions to this rule are clerical error, force majeure, fulfilment of legal regulations or when the amendment is in your favour.

This chapter sets out the rules for respecting acquired rights and legitimate expectations.

8.2 Validity certificate

A successful master degree certificate is inviolable, except in the case of proven fraud in the process of earning this.

8.3 Obtained credits and study results

The result of an exam and its corresponding credits remain valid until the board of examiners has made a substantiated decision that the examined material is so outdated that it can no longer be used in the profession and the term of validity has expired as of a date stipulated by the board of examiners.

Results obtained for modular exams remain valid and may – if they still fit in the new programme – lead to exemptions for modular exams. A modular exam can, if possible, be added to another course to replace a different modular exam that had the same learning outcomes or learning goals.

8.4 Participation in education, but not in exam or exam not passed

A student who has participated in the educational activities for a course in the academic year prior to the programme change, but who has not completed an exam or modular exam or has not passed an exam or modular exam, is entitled to repeat the educational activities at least during the academic year in which the change takes effect, and is entitled to at least two opportunities to take the (modular) exams.

8.5 Degree-specific transition regulations

The most recent assessment forms will always be used for marking the exams.

UOS in previous study years	Equal to UOS in 2023-2024	Brief commentary	Option to take old (modular) exams	Deviating provisions with respect to old UOS and (modular) exams

Drug Discovery and Development	Drug Discovery and Development	From 2018-2019 onwards, Structure Elucidation Analysis (DRD-SEA) is part of the examination of this module From 2020-2021 onwards, the study load of the Drug Discovery and Development module is 10 ECTS due to its actual study load.	Yes, students of 2016 year group	-
Vaccines and Diagnostics	Vaccines and Diagnostics	From 2024-2025 onwards the validation plan is not part of the Vaccines and Diagnostics module. Instead, the business plan is part of this module.	Yes, students of 2022 year group and earlier take the old modular exam.	-
Research and Product Development 2	Research and Product Development 2	From 2024-2025 onwards The business plan is not part of the module anymore.	Yes, students of 2022 year group and earlier take the old modular exam.	-
Graduation project	Graduation project	From 2020-2021 onwards, the assessment of the Graduation project changed. The assessment consists of 4 modular exams instead of one integral exam.	Yes, students of the 2018 year group and earlier can take the old integral exam for the “Graduation project” in 2024-2025 latest. In 2025-2026 they will have to follow the new style of graduating.	-

8.6 Adopted amendments to this degree statute

Not applicable

[Describe the amendments here].

In this section you will find a description of the adopted amendments on [date of adopted amendment(s)] as referred to in Part 1, under ‘Adoption’:

[Describe the amendments here].

In this section you will find a description of the adopted amendments on [date of adopted amendment(s)] as referred to in Part 1, under ‘Adoption’:

[Describe the amendments here].

HAN_UNIVERSITY OF APPLIED SCIENCES

PART 3 Other regulations

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1 Exam regulations

These regulations set out:

1. The rules of conduct for students in exam and modular exam sessions, insofar as these are not laid down in the Student Charter, the Education and Examination Regulations or related regulations.
2. The rules of conduct for students in review sessions and discussions of exams and modular exams, insofar as these are not laid down in the Student Charter, the Education and Examination Regulations or related regulations.

1 Code of conduct for students during exam sessions

The facilities provided by HAN for students with respect to exams and modular exams are laid down in the Student Charter and Education and Examination Regulations or related regulations. HAN also has a general code of conduct for students. In addition to general provisions, this code of conduct contains provisions governing the conduct of students at exam venues. These exam regulations contain additional provisions regarding student behaviour during written and digital exams in particular.

Behaviour
The student:

1. must follow the instructions given by the supervisor and treat the supervisor with respect;
2. must behave in such a way that they do not disturb other students at any time during the exam or when entering or leaving the exam venue. The student must be silent before, during and after the exam when in and near the room where the exam is being held;
3. must contact the supervisor as soon as possible if anything is unclear before and/or during the exam.

Identification and admission
The student:

1. must report to the supervisor at the exam room 15 minutes before the start of the exam;
2. will only be admitted to the HAN exam if they can identify themselves with a valid HAN student card or a valid proof of identity. This includes:
   - a passport;
   - a European identity document;
   - a Dutch driving licence;
   - a European driving licence;
   - a Dutch residence permit;
3. may only use an identity document to identify themselves if they are sitting for a national exam;
4. must place their valid student card or proof of identity at the top right-hand corner of the desk during the exam so the supervisor can check their identity;
5. will have their name checked off the attendance list by the supervisor to confirm their participation in the exam.

Theft/loss of identification
If the student cannot show identification due to theft or loss, they can participate in the exam using an original police report of the theft and/or official request to the municipal authorities for new identity papers. The supervisor should

contact the coordinator when determining whether to approve. This is then noted on the official report/attendance list.

Extra requirements for computer-based exam

1. When taking a computer-based exam, the student is expected to have actively participated in the mock exam organised by the degree course and to have been informed about the exam application, about the fraud prevention application and about the use of personal data;
2. The laptop the student brings with them for the computer-based exam or modular exam must meet the HAN requirements. These can be found at HAN Insite;
3. If the student's laptop is not compatible with the exam and fraud prevention software, the student may request a loan laptop from the degree course/school before participating in the exam or modular exam.

Before the start of the exam
The student:

1. may only place items needed to complete an exam on or next to the table;
2. may not – unless expressly stated otherwise – be in possession of any digital data carriers during the exam other than those expressly permitted and necessary for taking the exam or modular exam. This includes equipment with integrated digital data carriers, such as USB flash drives, calculators, special watches, special glasses, special earphones, etc.;
3. may not wear a watch. A clock is provided in all exam venues;
4. may not – unless expressly stated otherwise – use the following resources during the exam: hard-copy or digital versions of dictionaries, law books, textbooks, etc. If these resources are permitted, the hard-copy or digital resources will be made accessible and may be checked by the supervisors;
5. must put their coat, scarf, hat, bags, cases, mobile phone(s), smartphone(s), digital data carrier(s) and any equipment with integrated digital data carrier(s) in the place specified by the supervisor;
6. must turn off mobile phones, smartphones, etc. before putting them away;
7. must write their name, student number, class/group and other details requested by the supervisor on all written exam documents at the start of the exam. The student must also write these details on any note paper they use;
8. will not have direct access to the exam venue after the actual start of the exam. Students who do not make it to the exam venue on time are allowed to enter the exam venue when 30 minutes of the exam have passed and are allowed to sit the exam for the remainder of the exam time. The supervisor makes a note of which students are late. Students must strictly observe any instructions given by the supervisors regarding where they are allowed to sit and they may not disturb students who have already started the exam;
9. may log into the exam application prior to a computer-based exam, identify themselves via SURF-connext or Microsoft Azure, and wait at the cover sheet for the exam or modular exam until the supervisor signals that students may start the exam or modular exam.

During the exam
The student:

1. may not take toilet breaks during exam sessions of 120 minutes or less. During exams that last longer than 120 minutes, students may take a toilet break after 120 minutes if accompanied by a supervisor. Exceptions are possible for all exams in cases of physical discomfort, provided the supervisor is notified no later than 15 minutes before the start of the exam or immediately upon entry when arriving 30 minutes after the start of the exam;

2. may not leave or submit their work during the first 30 minutes of the actual start of an exam (to prevent disruption to other students and/or irregularities). If there are any students who enter the exam venue 30 minutes after the start, any students who want to leave may only do so after the late students have started their exam;
3. will be given access to additional exam facilities if they are entitled to those facilities according to OSIRIS or a decision to that effect by the board of examiners. These facilities are applicable if the student indicated when registering for the exam that they wanted to use these facilities;
4. may not consume any food during exams that are shorter than 150 minutes; students may consume food during exam sessions of 150 minutes or longer if this does not cause a nuisance to fellow students;
5. may only consume drinks from a resealable bottle/container;
6. must use the writing materials specified on the cover sheet (black or blue pen or lead pencil) to complete the written exam;
7. must ensure that multiple-choice forms are filled in correctly and according to the instructions given by the supervisor;
8. may not copy or scan a written or computer-based exam or parts thereof in any way or take the exam or its contents outside the exam venues in any manner:
9. may not use unauthorised digital resources, facilities or functions.

Resources
The student:

1. may not use resources other than those permitted. The permitted resources will be announced in advance by the department and will be listed on the exam cover sheet;
2. must ensure that resources do not have notes, etc. on them unless the exam cover sheet states that this is permitted;
3. must make sure that the laptop and accompanying mouse and earplugs they bring for computer-based exams meet the requirements set by HAN. These can be found at HAN Insite.

Suspected irregularity
The student:

1. will be referred to Part 2 of the degree statute (the education and examination regulations), and Part 3, chapter 3, of the degree statute (the regulations of the board of examiners) for provisions concerning irregularities or fraud, penalties for irregularities or fraud, and confiscation of evidence;
2. will be permitted by the supervisor to complete the exam in the event of reasonable suspicion of an irregularity or fraud and will sign to confirm they have seen the ‘Official exam report form’ that has been filled in by the supervisor. This form is appended to these regulations.

Handing in exam documents
The student:

1. must check before handing in the exam script and assignment(s) whether their name, student number, class/group number and any other details requested by the supervisor have been written correctly on all of the exam documents to be submitted;
2. must submit all the exam documents including used and unused note paper to the supervisor and sign the attendance list for confirmation;
3. must make sure everything is left neat and tidy before leaving the exam venue;

4. must make sure they close down the exam application and blocking software for the computer-based exam.

2 Code of conduct for students during review/discussion sessions of assessed exam work

There is a code of conduct for students. In addition to general provisions, this code of conduct contains provisions governing the conduct of students at exam venues.
Below are additional regulations regarding the review of assessed exam work, hereafter referred to as a 'review session'.

Before the review session: Only students who have taken part in the exam for which the review session is organised may be present in the classroom. A lecturer and a supervisor will be present during the review session.

Behaviour
The student:

1. must follow the instructions given by the supervisor and treat the supervisor with respect;
2. must behave in such a way that they do not disturb other students at any time during the review session or when entering or leaving the room where the review session takes place (hereafter referred to as the 'room');
3. must contact the supervisor a.s.a.p. if anything is unclear during the review session.

Identification and admission
The student:

1. must show the supervisor a valid HAN student card or another valid form of identification:
   - a passport;
   - a European identity document;
   - a Dutch driving licence;
   - a European driving licence;
   - a Dutch residence permit.
   If the student cannot show a HAN student card or a valid form of identification, they will not be allowed to take part in the review session/discussion;
2. In the case of theft or loss of the identity document, the student can apply for a certificate of enrolment at the exams office, which will give them admittance to the room. This certificate will only be issued if the student can show the original police report and/or official request to the municipal authorities for new identity papers;
3. must write their name on the attendance list provided by the supervisor to confirm their participation in the review session/discussion;
4. must place their valid student card or other form of identification at the top right-hand corner of the desk during the review session/discussion so the supervisor can check their identity;
5. will only be admitted to a digital review session if they have a laptop with them that meets the requirements set by HAN. These can be found at HAN Insite.

Start and resources
The student:

1. must ensure they have a copy of their answer sheet (yellow carbon copy) when reviewing a multiple-choice exam with OMR answer sheet;
2. must log in to the exam application when reviewing a digital exam or modular exam, and identify themselves via SURF-connext or Microsoft Azure;

3. may only place on the table the permitted resources listed on the review cover sheet or announced by the supervisor at the start of the review session;
4. may not – unless expressly stated otherwise – have any of the following in their possession during the review session: digital data carriers or equipment with an integrated digital data carrier, such as mobile phone, smartphone, USB flash drive, calculator, special watch, special glasses, special earphones, etc.;
5. must put their coat, scarf, hat, bags, cases, mobile phone(s), smartphone(s), digital data carrier(s) and any equipment with integrated digital data carrier(s) in the place specified by the supervisor;
6. must ensure their mobile phone(s), smartphone(s) or other digital data carrier(s) and any equipment with integrated digital data carrier(s) are switched off before putting them away.

During the review session/discussion
The student:

1. may not take a toilet break during the review session;
2. may not eat anything during the review session;
3. may only consume drinks from a resealable bottle/container;
4. may only place one or more of the following permitted documents on the table in the case of written exams:
   a. assessment form
   b. yellow carbon copy (of the multiple-choice exam with OMR answer sheet)
   c. exam script
5. may not make any annotations or amendments to the exam script. If the student does this anyway, this is reported to the board of examiners as an irregularity;
6. may not copy, scan or take with them any model answers or assignments. Neither may students copy their own exam scripts and/or those of other students;
7. may not copy or scan a written or computer-based exam or parts thereof in any way or take the exam or its contents outside the exam venues by any other means;
8. may not use unauthorised digital resources, facilities or functions.

In the case of protest
The student:

1. must carefully complete all requested details on the protest form.

Submitting reviewed (assessed) exam work
The student:

1. must submit all the exam documents received for the review session to the supervisor and sign the attendance list to confirm this;
2. must make sure they close the exam application and blocking software for the computer-based exam;
3. must make sure everything is left neat and tidy before leaving the room.

3 Final provisions

Unforeseen circumstances
In exceptional situations and cases not provided for by these regulations and in which an immediate decision is necessary, the decision will be taken by:

a. the head of the exams office (in so far as this is within the powers of the exams office);

b. the examiner (in so far as this is within their powers);
c. the chair of the board of examiners (in so far as this is within their powers);
d. the supervisor, in consultation with the coordinating supervisor if it is not possible to wait until one of the above authorised people is present.

The interested parties will be informed of the decision as soon as possible.

Complaints and appeals concerning decisions and procedures of the exams office
For more on this, see these HAN regulations:

- 'Complaints Regulations';
- 'Regulations for Legal Protection of Decisions Concerning Education'.

4 Appendix: Official exam report

Naam surveillant *Name of supervisor:*

……..……..

Code/naam tentamen *Code/name of exam*

……..……..

Tentamendatum en tentamentijdstip *Date and time of exam*

……..……..

***Tentamenlokaal** Exam room:*

……..……..

***Plaats** Place:*

……..……..

PART 1: UITREIKEN VAN HAN LAPTOPS / *LOAN OF HAN LAPTOPS*

Totaal aantal uitgeleende HAN laptops *Total number of loaned HAN laptops*

……..……..

Naam én studentnummer van de student aan wie de HAN laptop is uitgeleend en de reden van uitleen
Name and student number of the student to who the HAN laptop has been lent and the reason for lending

1. (Naam, studentnummer en reden *name, student number and reason***)**

……..……..

……..……..

2.……

……..……..

3. ……..

……..

4.……

……..……..

5.....

PART 2: MELDING VAN EEN GECONSTATEERDE VERMOEDELIJKE ONREGELMATIGHEID OF FRAUDE / ***NOTIFICATION OF A SUSPECTED IRREGULARITY OR FRAUD***

Naam student *Name of student*

……

Studentnummer *Student number*

……..…….....

Beknopt verslag door de surveillant van de geconstateerde vermoedelijke onregelmatigheid of fraude
Brief written report report of the suspected irregularity/fraud by the supervisor

……...

……...

Korte reactie van de student (je bent niet verplicht dit in te vullen, je krijgt nog de kans je verhaal te doen bij de examencommissie):

Brief response by the student (you are not required to fill out this form, you will still have the opportunity to tell your story to the Board of Examiners):

……..……..

……..……..

Handtekening surveillant *Supervisor's signature:*

……..……..

Handtekening 'voor gezien' van student *Student's signature to confirm he/she has read the form*

……..……..

The supervisor intervenes immediately in case of a suspected irregularity or fraud. The supervisor provisionally allows the student to finish the exam, and seizes all documents that they suspect are involved in the suspected irregularity/fraud. The supervisor fills in this form and submits it to the coordinating supervisor along with all accompanying items immediately after the exam. The student in question receives a copy of the completed form. The form is then sent to the board of examiners via the exams office. The board of examiners will contact the student.

De surveillant grijpt in geval van een redelijk vermoeden van een onregelmatigheid of fraude direct in. Hij laat de student onder voorbehoud het tentamen afmaken en neemt alle bescheiden in waarmee de vermoedelijke onregelmatigheid/fraude heeft plaatsgevonden. De surveillant vult dit formulier in en levert dit met alle bescheiden na afloop van het tentamen direct in bij de coördinator-surveillant. De student ontvangt een kopie van het ingevulde formulier. Via het Tentamenbureau gaat het formulier vervolgens naar de examencommissie. De examencommissie neemt contact op met de student.

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2 Regulations of the Board of Examiners

HAN_UNIVERSITY OF APPLIED SCIENCES

3 Regulations of the board of examiners 2024-2025

Section 1: General Provisions

Article 1.1 Terms and definitions

The terms and definitions applied in these regulations are those set out in Section 1.1 of the Education and Examination Regulations.

Article 1.2 Status and scope of these regulations

1. These regulations contain rules about the duties and powers of the School of Applied Biosciences and Chemistry board of examiners and measures they may take in this context, as well as rules about the implementation of those measures.
2. These model regulations are adopted annually as part of the model degree statute by the Executive Board with approval from the participation council.
   The board of examiners may amend paragraphs, articles and sections, provided the amendments do not conflict with the education and examination regulations (EER) of the degree programme(s), the HAN Student Charter or the Higher Education and Research Act.
3. These regulations have been adopted by the board of examiners and apply to the courses, exams, modular exams and final assessments for the following degree programme(s):
   - Bachelor degrees: Bioinformatics, Biology & Medical Laboratory Research, Life Science and Chemistry.
   - Master degree: Master of Molecular Life Sciences

Section 2: Decision-making and mandates, tasks and meetings

Article 2.1 Decision-making and Mandates

1. The chair of the board of examiners signs decisions by the board of examiners, unless this duty has been mandated to someone else.
2. The board of examiners can appoint a managing committee for matters concerning day-to-day affairs. This committee is composed of the chair of the board of examiners and another member and – insofar as this function is carried out – is supported by the official secretary. The managing committee is authorised to make provisions for current matters based on a general mandate. Should situations arise in which the managing committee cannot reach a decision, the situation is presented to the board of examiners as soon as possible for a decision.
3. The board of examiners can be supported in its activities by an official secretary.
4. The duties mandated by the board of examiners are listed in appendix 1 to this set of regulations. The board of examiners remains fully responsible for any duties and/or powers it mandates to others.
5. The duties mandated by or on behalf of the Executive Board to the board of examiners are listed in an overview that can be found in appendix 2.
6. The board of examiners ensures that it receives regular reports (in writing) regarding the process of its mandated duties and/or powers.

Article 2.2 Duties and powers of the board of examiners

The board of examiners has the following duties and powers:

1. Ensuring the quality of exams, modular exams and final assessments.
2. Adopting guidelines and instructions in addition to the EER about assessing exams, modular exams and final assessments in an objective, reliable, valid and transparent manner and determining their result.
3. Deciding that the term of validity of exam or modular exam results and the corresponding credits have expired, from a date determined by the board of examiners. This is only done in cases where reasoned arguments can be given showing that the knowledge, understanding and/or skills are so outdated that they are no longer useful for the profession.
4. Deciding on student requests for exemptions. If a decision is later shown to be based on incorrect evidence submitted by the student, the board of examiners is authorised to withdraw the decision.
5. Deciding that certain previously passed exams and modular exams, certificates and other declarations, diplomas and degree certificates entitle a student to exemptions for one or more exams and/or modular exams. An overview of designation decisions for groups of students is included in appendix 3 of these regulations.
6. Determining further rules and regulations regarding possible fraud and/or irregularities on the part of students, prospective students or external students, including any measures to be taken.
7. Adopting policies and rules about how the duties and powers should be performed as described in paragraphs 1, 2, 3, 4 and 5.
8. Ensuring the quality of the organisation of and the procedures for exams and final assessments.
9. When establishing guidelines and instructions as specified in paragraph 2, protocols are used for assessing (final) projects that meet national requirements as far as possible.
10. Appointing examiners and head examiners to administer exams and modular exams and to determine the results of those exams. The board of examiners sets guidelines about appointing and assigning tasks to examiners for each exam format.
11. Terminating the appointment of examiners.
12. Submitting proposals to the Executive Board for termination of a student's enrolment in the event of serious fraud.
13. Advising the Executive Board on the discontinuation of a student's enrolment in a degree programme as a consequence of the student's behaviour in relation to future practice of the profession.
14. Deciding in the event of a suspicion that a student has committed irregularities and/or fraud and, if necessary, taking measures in that regard, in accordance with the regulations of the board of examiners as laid down by the board of examiners.
15. Deciding on a student’s request to take a minor in accordance with the EER.
16. Deciding which HAN minors are approved as minors for the degree certificate of the degree programme(s). The overview of these HAN minors approved by the board of examiners can be found on https://work.han.nl/sites/InstituutABC/examen/SitePages/Introductiepagina.aspx
17. Deciding on a student's request for an extra opportunity to take an exam or modular exam.
18. Only for degree programmes composed of units of study: deciding on a student’s request to take an exam or modular exam for a course independently of the standard programme.
19. Deciding on a bachelor student's request to take exams and modular exams for the final bachelor assessment before they have passed the final propaedeutic assessment.

20. Deciding on a student's request to take educational components and complete exams and modular exams contrary to the applicable entry requirements.
21. Deciding on a student's request to take exams and modular exams in a different format from what is stipulated in the education and examination regulations.
22. Deciding on a student request, based on a disability or chronic illness or other condition such as pregnancy, to take exams and modular exams in an adapted format.
23. Deciding on a student's requests for an oral exam to be closed to the public. The board of examiners may also decide (in principle) to close certain exams and modular exams to the public without the student's request in cases where there are special reasons such as company confidentiality during a graduation meeting.
24. Issuing documentation, module certificates and declarations.
25. Contributing to the examination policy for the degree programme or group of degree programmes.
26. Advising the dean on the education and examination regulations.
27. Issuing a degree certificate as proof that a final assessment has been passed after the Executive Board has declared that the procedural requirements for issuing the certificate have been met.
28. The requirements for receiving a degree are that:
    - the student is enrolled at HAN University of Applied Sciences;
    - the tuition fees have been paid.
29. Deciding about the term of postponement when a student does not request his Degree Certificate after passing all the components of his final exam.
30. Issuing a statement of successfully completed exams, at the request of a student, in cases where the student has successfully completed more than one exam and to whom a degree certificate as referred to in article 7.11 paragraph 2 of the Higher Education and Research Act cannot be issued.
31. Only for degree programmes composed of units of study: Deciding on a request for exemption from mandatory participation, with or without imposing an equivalent substitute requirement.

Article 2.3 Meetings of the board of examiners

1. The board of examiners meets at least 10 times a year.
2. The meetings of the board of examiners are scheduled in such a way that they concur with the scheduling cycles of the degree programme(s) and the school.
3. The board of examiners decides by a simple majority of votes.
4. If the votes are equally divided, the chair has the deciding vote.
5. At each meeting, the board of examiners ratifies decisions taken in the intervening period by the managing committee based on its general mandate regarding day-to-day affairs, as well as any other decisions taken on the basis of mandated duties/powers.
6. The official secretary to the board of examiners ensures that a report is drawn up of every meeting. The report is adopted at the next meeting held by the board of examiners. The report includes a list of decisions made during the meeting.
7. The official secretary to the board of examiners ensures that the dean and any other members of the board of examiners receive a copy of the final report as soon as possible.
8. The official secretary to the board of examiners ensures that the final, anonymised reports of the meetings can be viewed digitally by lecturers/students/professors and others from the degree programme(s) concerned.

Article 2.4 Joint meeting of the dean and board(s) of examiners

1. The board of examiners meets with the school board at least 4 times per academic year.

Section 3: Quality assurance of exams, final assessments and organisation

Article 3.1 Ensuring the quality of exams

1. The board of examiners is responsible for ensuring the quality of exams.
2. The board of examiners will check if the guidelines and instructions as referred to in Article 3.2 are observed in practice and result in high-quality exams.
3. The board of examiners offers suggestions for improvements where needed.
4. Each year, the board of examiners prepares a monitoring plan / quality control plan to ensure the validity, reliability, feasibility and transparency of exams. This plan can be consulted via the annual report of the board of examiners.

Article 3.2 Guidelines and instructions for exams

1. Exams and modular exams are administered and graded by examiners and head examiners appointed by the board of examiners.
2. The examiners and head examiners examine and assess the exams and modular exams based on the criteria listed in the EERs and the guidelines and instructions adopted by the board of examiners.
3. The board of examiners adopts guidelines and instructions regarding:
    - the construction of exams; These can be consulted via the online environment of the board of examiners under the rules for decisions and points of attention: https://hannl.sharepoint.com/sites/instituutABC/examen/SitePages/Introductiepagina.aspx
    - the administering of exams; These can be consulted via the online environment of the board of examiners under the rules of decisions and points of attention, via the testing policy plan and via the educational descriptions in the EER of this study programme charter.
    - Extension of the examination time is not permitted for practical tests. The speed of action is part of the assessment.
    - the assessment and adoption of the result of exams. These can be consulted via Article 3.3 of these regulations, the online environment of the board of examiners under the rules of decisions and points of attention, via the testing policy plan and via the educational descriptions in the EER of this study programme charter.

Article 3.3 Ensuring the quality of final assessments

1. The board of examiners is responsible for ensuring the quality of the final assessments. They adopt and follow a policy for this.
2. The board of examiners regularly inspects whether the entirety of exams test all of the intended exit qualifications.
3. The board of examiners determines whether a student has the knowledge, understanding, skills and (if relevant) attitude, as described in the EER, required for obtaining a degree. The board of examiners will also determine whether a judicium is awarded. To this end, the board of examiners uses a (graduation) protocol that can be consulted via the online environment of the board of examiners, subject to rules on decisions and points of attention.
4. The board of examiners is authorised to administer their own further investigation/exam to reach a careful decision about the matters outlined in the previous paragraph.

5. The board of examiners periodically reviews the quality of final graduation projects. The board of examiners may have these reviewed by other persons, who then submit a report to the board of examiners.
6. The board of examiners will prevent the undue awarding or withholding of study credits by examiners by:
   - The partial examination and the answer model are made and evaluated by 2 examiners or an assessment form belonging to the course unit description is used (Chapter 9 EER).
   - The test is assessed on the basis of the response model.
   - The Assessment Committee randomly tests modular exams with the corresponding answer model. When in doubt, the modular exam is assessed by the board of examiners.
   - The assessment of a modular exams and the establishment of the grade takes place according to the assessment criteria described in the course unit descriptions (Chapter 9 EER) by the indicated examiners.
   - The exam grade is calculated automatically by the formula according to the weighting as described in the assessment programme.

Article 3.4 Ensuring the quality of the organisation and procedures around exams and exams

1. The board of examiners is responsible for ensuring the quality of the organisation and procedures regarding exams and final assessments.
2. The board of examiners shall ensure compliance with the directives and guidance on the examinations as set out in article 3.2 paragraph 3. The board of examiners meets periodically with the exams office about this and if needed also with the school board.

Article 3.5 External validation of the quality of final assessments

The board of examiners ensures that the quality of the final assessment is validated by external parties by the following measures:

- degree programme and school-wide examination;
- implementing a joint protocol for assessing final graduation projects;
- hire of external experts to assist in preparing exams and assessment procedures;
- hires external experts to assess exam results;
- hire of external supervisors to monitor the quality of the assessment of final graduation projects (appendix 4);

Section 4: Appointment and expertise of examiners

Article 4.1 Appointing examiners and expertise of examiners

1. The board of examiners appoints (external) examiners to construct, administer, assess and grade exams. If there is more than one examiner for an exam or modular exam, the board of examiners also appoints a head examiner.
2. Depending on their role in the examination process, examiners and head examiners are experts in their subject field and possess the necessary knowledge and skills to prepare exams, set out methods and standards for assessing exams, organise examinations and analyse the results of exams based on guidelines and criteria for reliable, valid and transparent examinations and assessments. For examiners of written tests in the MMLS programme, the English Life Sciences variant of the Biology and Medical Laboratory Research programme, in the English Chemistry variant of the Chemistry programme or other written tests taken in English, they must at least have the Cambridge certificate C1 (CAE) or be proficient in English at an equivalent level. For the assessment of professional products and practical work is a minimal command of the English language

required, equivalent to the Cambridge certificate B2.

3. The board of examiners ensures examiners have sufficient expertise. If necessary, the board of examiners can ask the dean to take the necessary measures to facilitate the professional development of examiners.
4. As a way of ensuring the expertise of examiners and head examiners, the board of examiners has a profile they use when appointing examiners. These profiles can be requested from the board of examiners.

Bachelor

i Teachers can be appointed examiner of professional products and practicals when they have at least obtained the Basic Examination Qualification (BKE) or an equivalent programme. They must have at least a Bachelor's degree.
ii Teachers can be appointed examiner of written tests and 1st examiner of internship and graduation assignments if they have been employed for at least one year and have at least obtained the Basic Examination Qualification (BKE) or an equivalent programme. The 1st examiner of the graduation project must also have completed a relevant Master's programme. The 1st examiner of the internship project must also have completed a relevant Bachelor’s programme.

iii Lecturers who have been employed for less for one year and / or (external) teachers who do not meet the profile for examiners may only under the supervision of an examiner who has pedagogical knowledge and skills drafting and reviewing written tests. In the joint assessment of written examinations, at least 50% of the lecturers who assess must have obtained their BKE.
iv In the first year of employment, teachers can only be appointed as 2nd examiner of the internship, when they have completed a relevant Bachelor’s programme.
v Lecturers can be appointed as 2nd examiner of the graduation project if they have been employed for at least 1 year and have completed a relevant Master's programme.

Master

i Lecturers can be appointed examiner when they have been employed for at least one year and have at least passed the Basic Qualification Exams (BKE) or an equivalent training. They must have at least a Master.
ii Lecturers can be appointed as 1st examiner of graduation assignments if they have been employed for at least one year and have obtained at least the Basic Qualification Exams (BKE) or equivalent training. The 1st examiner of the graduation project must also have completed a relevant Master's degree and have a PhD or equivalent experience in research and projectmanagement.
iii Lecturers can be appointed as 2nd examiner of the graduation project if they have been employed for at least 1 year and have completed a relevant Master's degree.
iv Lecturers who have not yet been employed for one year and / or (external) lecturers who do not meet the profile for examiners may only prepare and assess tests under the supervision of an examiner who has educational knowledge and skills. When jointly assessing examinations, at least 50% of the lecturers who assess them must have passed their BKE.

5. Examiners are appointed for one or more specific programme components (unit of learning outcomes, unit of study, exam or modular exam, phase, specialisation) and for a specific period.

6. The board of examiners informs examiners about their appointment and the profile description used.
7. If necessary, examiners and other parties involved may be heard by the board of examiners and asked to provide the board with specific information and/or advice.
8. If requested, examiners must be able to provide the board of examiners with materials for evaluating the quality of exams, assessment methods and assessment results (such as learning outcomes, test plans, test matrices, answer keys, assessment schemes, assessment criteria for assignments, the actual exams and/or assignments, the exam results and the analysis of the results).
9. If an examiner does not meet – or no longer meets – the required level of expertise, the board of examiners is authorised to revoke that examiner's appointment.

Section 5: Further rules for decisions regarding individual students

Article 5.1 EER as model document

The EER sets out model provisions regarding exams, modular exams, minors, assessment criteria, exemptions, exams and modular exams taken independently of the standard programme, Dutch proficiency, extended study load, study advice and studying with a disability, chronic illness or other special condition such as a pregnancy.

Article 5.2 Further rules regarding exemptions from exams and modular exams

1. The procedure for requesting and granting exemptions for the bachelor degree programme is as follows:
    - The student must submit a written request for exemption from taking a (modular) exam/assessment or making a pathway independent (modular) exam/assessment- including the associated evidence - directly to the board of examiners.
    - The board of examiners may consult examiners or an external expert in order to come to a decision.
    - The board of examiners decides within 20 working days over the submitted request and informs and justifies this decision in writing to the student.
    - If the exemption is granted or a learning pathway-independent exam is assessed as satisfactory or higher, the board of examiners ensures registration of the exemption or the assessment rating in the automated student information system.
2. The procedure for requesting and granting exemptions for the master degree programme is as follows:
    - Please send your completed form Request for Exemption (found at the Onderwijsonline site of the degree programme) to Examencommissie.ATBC@han.nl. You will receive an e-mail confirmation that the request will be processed within 15 working days. The written decision will follow as soon as possible after this meeting. The procedure describe above for requesting an exemption from the board of examiners is the regular procedure.
    - There is another, shorter procedure. You submit your request for exemption to the programme of study, the programme of study will then contact the board of examiners. Contact your degree programme for more information; see also the information in this degree statute/EER about whether the student can be granted an exemption and based on which knowledge, skills and background.
    - If the exemption is granted or a learning pathway-independent exam is assessed as satisfactory or higher, the board of examiners ensures

registration of the exemption or the assessment rating in the automated student information system.

3. Designation decisions which offer the prospect of exemptions for special target groups (e.g. as part of an abridged programme), can be found in Appendix 3.

Article 5.3 Further rules on studying with a functional disability, chronic illness or with some other special condition such as pregnancy.

1. If the student requires non-standard facilities relating to examination, the senior study advisor submits the request on behalf of the student to the board of examiners.
2. The study career coach or senior study career coach advises the board of examiners about the request and is responsible for the communication about the required measures. He/she also ensures that the measures are implemented in an effective manner and that the special facilities approved by the board of examiners are recorded in an agreement.

Article 5.4 Further rules regarding flexible minors

The board of examiners will request documentation from students for passed exams that were approved by the board of examiners for a flexible minor. This documentation may comprise a certificate, a statement or other documents showing the student passed the approved exam.

1. The documentation will be archived by the board of examiners.
2. After the board of examiners has received the documentation, the board will record the results of the exam or the exams for the flexible minor in OSIRIS.
3. For a free minor of 30 credits consisting of non-foundation year subjects at university (WO) level, a fail mark (4.0 or higher) may be obtained for a maximum of 6 credits. The weighted average result of the examination results should be 5.5 or higher to complete the free minor successfully.

Article 5.5 Further rules regarding study advice (if mandated by the dean)

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Article 5.6 Further rules on requesting an extra exam opportunity

Students can use a case process in OSIRIS to request an extra examination opportunity and/or another examination time.

Article 5.7 Further rules for requesting a different exam format

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Article 5.8 Further rules for requesting to take an exam independently of the standard programme

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Article 5.9 Further rules for determining the term of postponement if a Degree Certificate is not requested

Students who wish to pass the Propaedeutic Examination, Bachelor's Examination or Master's Examination will apply for graduation in OSIRIS for this purpose. Students who are eligible to pass the propaedeutic examination, Bachelor's examination or Master's examination, but have not applied for graduation in OSIRIS, will not be discussed in the next examination meeting. The board of examiners checks periodically which students are eligible for graduation but have not

applied for graduation yet. In consultation with the student, the board of examiners sets a deadline for which a postponement for graduation is granted. This period may not exceed 2 years from the time the student was first eligible for graduation.

Section 6: Irregularity and fraud in (modular) examinations

Article 6.1 Definition of irregularities and fraud

1. An irregularity is defined as "any action or omission by an interested party in which they either intentionally or unintentionally give the wrong impression of their own or one or more other interested parties' knowledge, understanding, skills and attitude."
2. Fraud is defined as "any action or omission of which the interested party knew or should have known that this action or omission made it partly or wholly impossible to form a correct judgement of their or someone else's knowledge, understanding and (if relevant) attitude. And/or intentionally influencing (components of) the exam or exemption awarding process with the purpose of influencing the results of the exam or modular exam or decision about exemption or with the purpose of obtaining a different result for the exam or modular exam or request for exemption."
3. The following situations are in any case considered to be an irregularity or fraud:
    a) intentionally or unintentionally submitting work in a portfolio and/or presenting or submitting work as a group's or an individual's own work (such as a thesis, project, assignment or other written piece for submission), while it was wholly or partly copied or created by the student in unauthorised collaboration with one or more other students; This also includes the following rules:
        i paraphrasing the content of someone else's texts with insufficient references;
        ii using or copying someone else's texts, data or ideas without providing the complete and correct references;
        iii unclearly indicating in your text, for example without quotation marks or some other formatting, that the text has literally been copied from another author, even if you have provided the right references;
        iv submitting text you have previously already submitted or that is comparable to what you have previously submitted for assignments or other exam components;
        v submitting other types of written pieces acquired from a commercial institute or that have been written by someone else (whether or not for a fee);
        vi not or barely contributing to a (group) assignment, but placing or having someone else place your name under the (group) work.
    b) allowing exam questions and/or answers to be disclosed or obtaining knowledge of these during and/or before the exam sitting;
    c) aiding or assisting another student in a way that gives in an incorrect impression of that other student's knowledge, understanding and/or skills;
    d) seeking and/or receiving aid or assistance from a fellow student or other person in a way that gives an incorrect impression of the student's knowledge, understanding and/or skills;
    e) obtaining access to resources that are not permitted during an exam;
    f) using permitted resources during an exam that contain unauthorised notes and/or additions (e.g. margin notes or notes or additions on separate pieces of paper);
    g) leaving the exam room and returning to the room during an exam without explicit permission;

h) leaving the exam room with the completed exam or part of it, also in cases when that answer sheet is subsequently handed in to the supervisor or their substitute;
i) making changes to a completed exam already submitted to an examiner or a written exam or integrated exam already assessed by the examiner;
j) sitting an exam under someone else's name, or having another person sit an exam for you;
k) violating the rules that apply to reviewing and discussing marked exams;
l) any other matters or incidents which the board of examiners sees as constituting an irregularity.

Article 6.2 Confiscation of evidence

In the event of a reasonable suspicion of an irregularity or fraud, the examination committee, (principal) examiner and those involved in the examination on behalf of the school board are authorised to confiscate any material that may serve as evidence of the irregularity or fraud. After the decision of the board of examiners as referred to in article 6.5 has become final and conclusive, the board will return the confiscated materials to the student.

Article 6.3 Measures taken in the event of fraud and irregularities

1. The board of examiners may impose one or more of the following measures if a student commits an irregularity or fraud during any part of an exam or modular exam:
   a) giving a written warning;
   b) giving a written reprimand;
   c) invalidating an administered exam and the exam result if the board of examiners is unable to guarantee the quality of that exam due to the irregularity or fraud. If an exam is invalidated, this will lead to an exam result of 0;
   d) withholding a student's degree certificate (if the irregularity or fraud is not discovered until after an exam has taken place);
   e) deciding the degree certificate can only be awarded after the student has retaken an exam in a manner, on a date and at a time to be decided by the board of examiners (if the irregularity or fraud is not discovered until after the exam has taken place);
   f) revoking the degree certificate after it has been issued (if the serious fraud was not discovered until after the certificate was issued to the student).
2. In the event of an irregularity or fraud, the board of examiners may deny a student access to one or more exams for a period not exceeding one year;
3. In the event of serious fraud, the board of examiners may recommend that the Executive Board terminate the student's enrollment for the degree course concerned.
4. If, in the opinion of the board of examiners, an examination taken does not meet the quality criteria for testing as a result of an irregularity or fraud committed by a person other than the student, the board of examiners may decide to declare (part of) the examination and/or the examination result invalid. Invalidating a past exam leads to the exam results being annulled or not being awarded. Students affected by this are offered the opportunity to redo the exam (or part of the exam) concerned.

Article 6.4. Hearing the student, the reporter of the irregularity and any third parties

1. The board of examiners will notify a student immediately, if possible orally but always in writing, of any reported irregularity or fraud involving that student at an exam.
2. The student will be given the opportunity to be heard by the board of examiners before a final decision is made.
3. If the student wishes to be heard, they need to make this known in writing within eight working days of the date on which he or she was notified of the opportunity to be heard.
4. The student must be heard no later than 10 working days after receipt of their request.

5. The board of examiners can hear the person who reported the irregularity and any third parties before making a final decision on the irregularity or fraud.
6. Before the hearing takes place, the student is informed of their right not to answer the questions posed by the board of examiners.
7. Any third parties brought along by the student may not be refused. They are permitted to be present as an observer.

Article 6.5 Announcement of decision

1. If the student does not respond in writing within 8 working days of being informed about the possibility to be heard, the board of examiners will presume that the student does not wish to be heard. After expiry of this period, the board of examiners will inform the student in writing of the decision or proposal/recommendation to the Executive Board within 10 working days.
2. If the student, reporter or any third parties are heard, the board of examiners will inform the student in writing within 10 working days after the hearing of the decision or of a proposal/recommendation to the Executive Board.

Section 7: Degree certificate and diploma supplement

Article 7.1 EER as model document

1. The EER stipulates model provisions with regard to units of learning outcomes / units of study[1], exams and degree certificates.
2. The board of examiners uses the formats for degree certificates, diploma supplements and other certificates adopted by the Executive Board and when awarding certificates [2] follows the principles and procedures set out in the notes of that decision.
3. After the board of examiners has established that a student has passed the final bachelor assessment, that student can submit a request to receive their degree certificate before the set dates.. The board of examiners will grant this request, and the student needs to take into account a processing period of at least 10 working days.

Article 7.2 Translation of degree certificate

For translations, graduates can contact a certified translator at their own expense (see: http://www.ngtv.nl).
All costs for the translation are to be paid for by the student.

Section 8: Annual report of the board of examiners

Article 8.1 Annual report of the board of examiners and dean

1. Each year in November, the board of examiners writes a report on its activities during the previous academic year and sends this to the Executive Board and dean.
2. The board of examiners uses the guidelines for the annual report.
3. The relevant school managers receives a copy of the annual report.

Section 9: Final provisions

[1] This should be read as 'units of learning outcomes' for modules that are part of the experiment and 'units of study' for modules that are not yet included in the experiment or for the full-time degree format.

[2] Last adopted version: Executive Board decision 2021/1883. Always check if a more recent version has been adopted.

Article 9.1 Unforeseen circumstances

Matters not provided for by these regulations in which an immediate decision is needed will be decided on by the chair of the board of examiners, provided that doing so falls within the powers of the board of examiners. The chair will communicate their decision to all interested parties as soon as possible.

Article 9.2 Complaints and appeals concerning decisions and procedures of a board of examiners

1. A student can submit an appeal to the Examination Appeals Board against a decision made by the board of examiners or an examiner within 6 weeks after this decision was announced. The procedure is outlined in the 'Regulations for Legal Protection of Decisions Concerning Education' in the HAN Student Charter.
2. Every decision taken by the board of examiners or individual examiner contains a remedy clause. This clause stipulates at least the following:
   a. an appeal must be made within six weeks of the date of the decision;
   b. an appeal can be lodged with the Examination Appeals Board;
   c. The correct and current address details of the Examination Appeals Board;
   d. a reference – for more information – to the 'Regulations for Legal Protection of Decisions Concerning Education' of the HAN Student Charter.
3. If a student wants to file a complaint against an examiner or member of the board of examiners, they can consult the procedure set out in the complaints regulations of the HAN Student Charter.
4. If a complaint or appeal concerns a member of the board of examiners, this member of the board of examiners does not take part in processing the complaint or appeal on behalf of the board of examiners.

Article 9.3 Adoption, effective date and amendments

1. These regulations were adopted by the SABC board of examiners on 27 June 2024 and will take effect from 1 September 2024.
2. These regulations replace the Regulations of the SABC board of examiners that were adopted on 24 May 2023.
3. These regulations will be made available to the students and staff of the degree programme(s) as referred to in article 1.2 paragraph 3 of these regulations by inclusion in the Degree Statute.
4. Amendments to these regulations can be made by the board of examiners in the form of separate decisions. Amendments during the current academic year will be made only if this is necessary for the protection of students' interests.
5. Amendments to these regulations may not have any adverse impact on decisions that were made earlier by the board of examiners and were made based on these regulations.

Nijmegen, 27 June 2024

On behalf of the board of examiners C. H. Smit, chairman

Appendix 1: Duties delegated by the board of examiners

Overview of duties delegated by the board of examiners (by board of examiners – mandate giver – mandate decision(s) taken)

	Duties delegated by the board of examiners	Mandated body, or job title or specific duties of the mandated staff member,
1	approve or disapprove of a student to follow a Free Minor, i.e. a minor from another HBO institution or university	daily committee consisting of chairman and (vice-) secretary
2	contrary to the main rule, grant a student access to take examinations of the final examination before the propaedeutic examination has been passed successfully	
3	decides on handling of irregularities of modular exams/assessments.	
4	draw up an amicable settlement/rejection in the event of objections by students submitted to the Examination Appeals Board.	
5	decide on individual exemption requests of students;	
6	deciding on requests for special learning pathways and examinations that are independent of the learning pathway	
7	provide examiners with further guidelines and instructions on the assessment of the person taking the examination and on the determination of the results of the examinations	
8	decides to offer a student an extra (third) opportunity to take a modular exam/test;	
9	decide whether the student has access to an examination	
10	decides on the request of (senior) study coach (on behalf of student) regarding extra exam facilities (relating to taking part exams)	
11	decides on other special requests of students;	
12	establishing of overview of successfully completed exams	
13	to continuously monitor and promote the quality of examinations.	ATBC Assessment committee
14	continuously monitor and promote the competence of examiners.	
15	hear the student before a binding negative study advice is issued by the board of examiners. The hearing will be communicated to the board of examiners during the examination meeting of the foundation year phase when the study advice is adopted.	Study Coach.
16	giving permission for a student to follow a certified HAN minor. The list of approved HAN-minors can be found at #OnderwijsOnline under content - ATBC-minors.	

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Note:
- The mandate will remain valid unless revoked by the board of examiners and as long as the mandated person remains employed by HAN and performs the duties specified above.
- Unless otherwise explicitly stated, those mandated are not authorised to further delegate these duties.

Nijmegen, 27-6-2024

board of examiners C.H. Smit, chairman

Appendix 2: Duties delegated to the board of examiners by or on behalf of the Institutional Board

Overview of duties delegated to the board of examiners

	Duties delegated to the board of examiners
1	Granting the degree of Bachelor of Science of Master of Science
2	issuing the foundation year study advice. The exception to this is the binding negative study advice.
3	the declaration at the written request of a student and/or the management of a university masters course that the student is registered at the relevant Higher Vocational Education bachelor course and the expectation when this student will have taken the final examination of this course successfully.

Note:

- The mandate will remain valid unless revoked and as long as the mandated party remains employed by HAN and performs the duties specified above.
- Unless otherwise explicitly stated, those mandated are not authorised to further delegate these duties.

Appendix 3: For the right to specific exemption(s) for previously obtained exams and modular exams, degree certificates and other statements, diplomas and certificates

Decree on the abridged learning route MLO 2024-2025

For the academic year 2024-2025 is decided that students with an MLO diploma may participate in an abridged route. Students are not required to take the abridged route, and are free to choose for the regular 4-year degree programme.
The board of examiners shall grant students who participate in the abridged route access to one or more parts of the final examination, before they have successfully completed the foundation year examination of the selected programme of study.
As soon as students with an MLO degree enter the abridged programme, they are granted exemption for practical and IPS belonging to General practical skills 1 (GENEAP-TOETS-01 en -02) and the examinations belonging to General practical skills 2 (GENEBP) and General theory 1 (GENEAT) and 2 (GENEBT).

Students **Life Sciences** participating in the abridged route meet the requirements for the propaedeutic exam if they can demonstrate that General competences 1 (GENEAC) and 2 (GENEBC) and the safety exam belonging to General practical skills 1 (GENEAP-TOETS-03) have been completed and the professional tasks of Biomolecules (competences, practical and theory, resp. LSBIOC, LSBIOP and LSBIOT) and Medical Diagnostics (competences, practice and theory, resp. LSMEDC, LSMEDP and LSMEDT), including the general higher professional education competences, have been mastered at level 1 by passing the exams belonging to:

a. Biomolecules (competences, practical and theory, resp. LSBIOC, LSBIOP and LSBIOT) and Medical Diagnostics (competences, practice and theory, resp. LSMEDC, LSMEDP and LSMEDT)

or

b. Professional Skills Level 2 Part 1 (LSPROA) OR Part 2 (LSPROB)
and
Molecular/Biochemical practical (LSMOLP) OR Interactions practical (LSINTP)
and
Molecular/Biochemical theory (LSMOLT) OR Interactions theory (LSINTT) from the second year of the Life Sciences programme (level 2).

After completing Professional Skills level 2 part 1 (LSPROA) OR part 2 (LSPROB), exemption is given for Biomolecules competences (LSBIOC) and Medical Diagnostics competences (LSMEDC).
After completing Molecular/Biochemical theory (LSMOLT) OR Interactions theory (LSINTT), exemption is given for Biomolecules theory (LSBIOT) and Medical Diagnostics theory (LSMEDT).
After completing Molecular/Biochemical practical (LSMOLP) OR Interactions practical (LSINTP), exemption is given for Biomolecules practical (LSBIOP) and Medical Diagnostics practical (LSMEDP).

Students **Chemistry full-time** participating in the abridged route meet the requirements for the propaedeutic exam if they can demonstrate that General competences 1 (GENEAC) and 2 (GENEBC) and the safety exam belonging to General practical skills 1 (GENEAP-TOETS-03) have been completed and the professional tasks of Separation and Purification (theory, practical and competency, resp. CEPURT, CEPURP, CEPURC) and Chemistry in Equilibrium (theory, practical and competency, resp. CECIET, CECIEP, CECIEC), including the general higher professional education competences, have been mastered at level 1 by passing the exams belonging to:

a. Separation and Purification (theory, practical and competency, resp. CEPURT, CEPURP, CEPURC) and Chemistry in Equilibrium (theory, practical and competency, resp. CECIET, CECIEP, CECIEC)

or

b. Analysis of Reaction Mixtures theory (CEORAT), Natural Product Synthesis theory (CESYNT), Instrumental Analysis theory (CEANAT) OR Biobased polymers theory (CEBBPT) AND Chemistry Practical 2nd year 1 or 2 (CEPRAA or CEPRBB)
AND
Natural Product Synthesis competency (CESYNC), Biobased Polymers competency (CEBBPC) OR Instrumental Analysis competency (CEANAC)
AND
modular exam Knowledge test Organic Chemistry including spectruminterpretation (TOETS-01) from Natural Product Synthesis theory (CESYNT)
AND
modular exam Professionalization 2 (CEBBPC-TOETS04) from the second year of the full-time course chemistry (level 2).

- Analysis of Reaction Mixtures theory (CEORAT), Natural Product Synthesis theory (CESYNT), Instrumental Analysis theory (CEANAT) OR Biobased polymers theory (CEBBPT) AND modular exam Knowledge test Organic Chemistry including spectruminterpretation (TOETS-01) from Natural Product Synthesis theory (CESYNT) give exemption for Separation and Purification theory (CEPURT).
- Analysis of Reaction Mixtures theory (CEORAT), Natural Product Synthesis theory (CESYNT), Instrumental Analysis theory (CEANAT) OR Biobased polymers theory (CEBBPT)gives exemption for Chemistry in Equilibrium theory (CECIET).
- Chemistry Practical 2nd year 1 or 2 (CEPRAA or CEPRBB) gives exemption for Separation and Purification practical (CEPURP) AND Chemistry in Equilibrium practical (CECIEP).
- Instrumental Analysis competency (CEANAC), Natural Product Synthesis competency (CESYNC) OR Biobased Polymers competency (CEBBPC) gives exemption for Separation and Purification competency (CEPURC).
- Instrumental Analysis competency (CEANAC), Natural Product Synthesis competency (CESYNC) OR Biobased Polymers competency (CEBBPC) and modular exam Professionalization 2 (CEBBPC-TOETS04) give exemption for Chemistry in Equilibrium competency (CECIEC).

This rule does not apply if the student participates in the course unit at the lower level.

Students **Chemistry part-time** participating in the abridged route meet the requirements for the propaedeutic exam if they can demonstrate that the units of learning outcomes belonging to Module P Chemistry on the lab (CDCLAB) have been completed, by passing the exams belonging to:

a. The units of learning outcomes belonging to Module P Chemistry on the lab (CDCLAB): Thermodynamics and polymers (CDPTHP), Lab calculations, mathematics, physics and safety (CDPBAS), Analysis, separation and purification (CDPONV) and Assessment (CDPASS).

or

b. The units of learning outcomes belonging to Module A Instrumental analysis (INSANV09, level 2): CDA-1 (CDASEC), CDA-2 (CDAASB), CDA-3 (CDAONV) and CDA-4 (CDAASS), the general higher professional education competences level 1, and course BKCH: Basic knowledge Chemistry.

or

c. The units of learning outcomes belonging to Module A Instrumental analysis (INSANV09, level 2): CDA-1 (CDASEC), CDA-2 (CDAASB), CDA-3 (CDAONV) and CDA-4 (CDAASS), the general hbo-competences level 1 and unit of learning outcomes Lab calculations, mathematics, physics and safety (CDPBAS) belonging to Module P Chemistry on the lab (CDCLAB).

General theory 1 and 2 (GENEAT and GENEBT) and General practical skills 1 and 2 (GENEAP and GENEBP) are introductory courses in which basic theory and basic skills are discussed. This basic theory and skills have already been discussed at the MLO.

A comparison of the competencies of the foundation year phase (level 1) in the competency profile of the Chemistry programme or the Life Science/ Biology and Medical Laboratory Research programme shows that the competency development in semester 2 of the propaedeutical phase (LS: LSBIOC/P/T and LSMEDC/P/T; Chemistry: CEPURT/P/C and CECIET/P/C) is a continuation of the competency development in semester 1 (GENEAP/T and GENEBP/T), both in terms of knowledge and skills. In the document 'Relationship between competencies and modular examinations level I' that was made for both the Chemistry programme and the Life Science/ Biology and Medical Laboratory Research programme, it has been made clear that the competencies and corresponding indicators of level 1 that are tested in GENEAP/T and GENEBP/T are also tested in semester 2 of the Chemistry programme (CEPURT/P/C and CECIET/P/C) or the Life Science/Biology and Medical Laboratory Research programme (LSBIOC/P/T and LSMEDC/P/T).
A comparison of the competencies at level 1 and level 2 in the competency profile of the Chemistry programme and the Life Science/Biology and Medical Laboratory Research programme shows that the competency development in the second year (level 2) covers that of the first year (level 1). The documents 'Relationship between competencies and modular examinations level I' and 'Relationship between competencies and modular examinations level II', which were made for both the Chemistry programme and the Life Science/Biology and Medical Laboratory Research programme, show that all competencies with their corresponding indicators at level 1 and level 2 are tested in the modular examinations of year 1 and year 2 respectively. Based on this, the board of examiners has decided that for a student with an MLO diploma, if he can demonstrate that he has passed an examination for an course unit at a higher level (level 2), he has also demonstrated that he has mastered this examination for an course unit at a lower level (level 1).
This regulation for students with an MLO diploma has been drawn up because years of experience have shown that if these students meet the conditions (see above) it is quite possible to obtain the course units from the second year without first having done the course units from the first year, due to the extra knowledge and skills gained during their MLO training. If participation in the abridged route proves to be too difficult, it will be possible to return to the first year of study and to participate in semester 2 (course unit 3 and 4).

Nijmegen, 27-6-2024

C.H. Smit, Chair, board of examiners ATBC

Decree on the abridged learning route for VWO, HBO or WO 2024-2025

For the academic year 2024-2025, is decided that students with a VWO diploma may participate in an abridged route. Students with obtained credits from a related HBO or WO study programme may also participate in this abridged route. Students are not required to take the abridged route, and are free to choose for the regular 4-year degree programme.
The board of examiners shall grant students who participate in the abridged route access to one or more parts of the final examination, before they have successfully completed the foundation year examination of the selected programme of study.
As soon as students with a VWO diploma enter the abridged programme, they will receive an exemption for the modular exams Laboratory calculations 1a and 1b (GENEAC-TOETS01 and GENEBC-TOETS01) for a qualification 7 or more for chemistry on the VWO diploma and an exemption for the modular exams Mathematics 1a and 1b (GENEAC-TOETS02 and GENEBC-TOETS02) for a qualification 7 or more for mathematics B on the VWO diploma. In the case of students with a HBO or WO study programme, the board of examiners will assess whether the examinations obtained with the related study programme lead to an exemption from the modular examinations for lab calculations and/or mathematics.

Students **Life Sciences** participating in the abridged route meet the requirements for the propaedeutic exam if they can demonstrate that General competences 1 (GENEAC) and 2 (GENEBC) and the safety exam belonging to General practical skills 1 (GENEAP-TOETS-03) have been completed and the professional tasks of Biomolecules (competences, practical and theory, resp. LSBIOC, LSBIOP and LSBIOT) and Medical Diagnostics (competences, practice and theory, resp. LSMEDC, LSMEDP and LSMEDT), including the general higher professional education competences, have been mastered at level 1 by passing the exams belonging to:

a. Biomolecules (competences, practical and theory, resp. LSBIOC, LSBIOP and LSBIOT) and Medical Diagnostics (competences, practice and theory, resp. LSMEDC, LSMEDP and LSMEDT)

or

b. Professional Skills Level 2 Part 1 (LSPROA) OR Part 2 (LSPROB)
and
Molecular/Biochemical practical (LSMOLP) OR Interactions practical (LSINTP)
and
Molecular/Biochemical theory (LSMOLT) OR Interactions theory (LSINTT) from the second year of the Life Sciences programme (level 2).

After completing Professional Skills level 2 part 1 (LSPROA) OR part 2 (LSPROB), exemption is given for Biomolecules competences (LSBIOC) and Medical Diagnostics competences (LSMEDC).
After completing Molecular/Biochemical theory (LSMOLT) OR Interactions theory (LSINTT), exemption is given for Biomolecules theory (LSBIOT) and Medical Diagnostics theory (LSMEDT).
After completing Molecular/Biochemical practical (LSMOLP) OR Interactions practical (LSINTP), exemption is given for Biomolecules practical (LSBIOP) and Medical Diagnostics practical (LSMEDP).

After completing Biomolecules (competences, practical and theory, resp. LSBIOC, LSBIOP and LSBIOT) and Medical diagnostics (competences, practical and theory, resp. LSMEDC, LSMEDP and LSMEDT) exemption is given for General practical skills 1 and 2 (GENEAP and GENEBP) and General Theory 1 and 2 (GENEAT and GENEBT).

Students **Chemistry** participating in the abridged route meet the requirements for the propaedeutic exam if they can demonstrate that General competences 1 (GENEAC) and 2 (GENEBC) and the safety exam belonging to General practical skills 1 (GENEAP-TOETS-03) have been completed and the professional tasks of Separation and Purification (theory, practical and competency, resp. CEPURT, CEPURP, CEPURC) and Chemistry in Equilibrium (theory, practical and competency, resp. CECIET, CECIEP, CECIEC), including the general higher professional education competences, have been mastered at level 1 by passing the exams belonging to:

a. Separation and Purification (theory, practical and competency, resp. CEPURT, CEPURP, CEPURC) and Chemistry in Equilibrium (theory, practical and competency, resp. CECIET, CECIEP, CECIEC)

or

b. Analysis of Reaction Mixtures theory (CEORAT), Natural Product Synthesis theory (CESYNT), Instrumental Analysis theory (CEANAT) OR Biobased polymers theory (CEBBPT) AND Chemistry Practical 2nd year 1 or 2 (CEPRAA or CEPRBB)
AND
Natural Product Synthesis competency (CESYNC), Biobased Polymers competency (CEBBPC) OR Instrumental Analysis competency (CEANAC)
AND
modular exam Knowledge test Organic Chemistry including spectruminterpretation (TOETS-01) from Natural Product Synthesis theory (CESYNT)
AND
modular exam Professionalization 2 (CEBBPC-TOETS04) from the second year of the full-time course chemistry (level 2).

- Analysis of Reaction Mixtures theory (CEORAT), Natural Product Synthesis theory (CESYNT), Instrumental Analysis theory (CEANAT) OR Biobased polymers theory (CEBBPT) give[s] exemption for Separation and Purification THEORY (CEPURT) AND Chemistry in Equilibrium theory (CECIET).
- Chemistry Practical 2nd year 1 or 2 (CEPRAA or CEPRBB) gives exemption for Separation and Purification practical (CEPURP) AND Chemistry in Equilibrium practical (CECIEP).
- Instrumental Analysis competency (CEANAC), Natural Product Synthesis competency (CESYNC) OR Biobased Polymers competency (CEBBPC) gives exemption for Separation and Purification competency (CEPURC).
- Instrumental Analysis competency (CEANAC), Natural Product Synthesis competency (CESYNC) OR Biobased Polymers competency (CEBBPC) and modular exam Professionalization 2 (CEBBPC-TOETS04) give exemption for Chemistry in Equilibrium competency (CECIEC).

or

a. The units of learning outcomes belonging to Module A Instrumental analysis (INSANV09, level 2): CDA-1 (CDASEC), CDA-2 (CDAASB), CDA-3 (CDAONV) and CDA-4 (CDAASS), the general higher professional education competences level 1, and course BKCH: Basic knowledge Chemistry.

This rule does not apply if the student participates in the course unit at the lower level.

After completing Separation and Purification (theory, practical and competency, resp. CEPURT, CEPURP, CEPURC) and Chemistry in Equilibrium (theory, practical and competency, resp. CECIET,

CECIEP, CECIEC), exemption is given for General practical skills 1 and 2 (GENEAP and GENEBP) and General Theory 1 and 2 (GENEAT and GENEBT).

A comparison of the subject matter of mathematics and lab calculations (GENEAC, GENEAP) with the contents of the Mathematics B and Chemistry VWO 2015 exam programme shows that the exemption of the mathematics and labeling part examinations is justified.
A comparison of the competencies of the propaedeutic phase (level 1) in the competency profile of the Chemistry programme or the Life Science/Biology and Medical Laboratory Research programme shows that the competency development in semester 2 of the propaedeutical phase (LS: LSBIOC/P/T and LSMEDC/P/T; Chemistry: CEPURT/P/C and CECIET/P/C) is a continuation of the competency development in semester 1 (GENEAP/T and GENEBP/T), both in terms of knowledge and skills. In the document 'Relationship between competencies and modular examinations level I' that was made for both the Chemistry programme and the Life Science/ Biology and Medical Laboratory Research programme, it has been made clear that the competencies and corresponding indicators of level 1 that are tested in GENEAP/T and GENEBP/T are also tested in semester 2 of the Chemistry programme (CEPURT/P/C and CECIET/P/C) or the Life Science/Biology and Medical Laboratory Research programme (LSBIOC/P/T and LSMEDC/P/T).

A comparison of the competencies at level 1 and level 2 in the competency profile of the Chemistry programme and the Life Science/Biology and Medical Laboratory Research programme shows that the competency development in the second year (level 2) covers that of the first year (level 1). The documents 'Relationship between competencies and part examinations level I' and 'Relationship between competencies and part examinations level II', which were made for both the Chemistry programme and the Life Science/Biology and Medical Laboratory Research programme, show that all competencies with their corresponding indicators at level 1 and level 2 are tested in the part examinations of year 1 and year 2 respectively.
On this basis, the board of examiners has decided that for a student with a VWO diploma, or examinations obtained at a related HBO or WO study programme, if he can prove that he has passed an examination belonging to an course unit at a higher level (level 2), he has also demonstrated that he has mastered this examination belonging to an course unit at a lower level (level 1).
This regulation for students with a VWO diploma has been drawn up because years of experience have shown that if these students meet the conditions (see above) it is quite possible to obtain the course units from the second year without first having done the course units from the first year, due to the extra knowledge and skills gained during their VWO study. If participation in the abridged route proves to be too difficult, it will be possible to return to the first year of study and to participate in semester 2 of the propaedeutical phase.

Nijmegen, 27-6-2024

C.H. Smit, Chair, board of examiners ATBC

Decree on the abridged learning route Bonn-Rhein-Sieg 2024-2025

For the academic year 2024-2025, is decided that students who have completed the first two years of the three-year Bachelor's programme at the Hochschule Bonn-Rhein-Sieg may enter the third year of the Life Science variant of the Biology and Medical Laboratory Research programme, graduating in Biomedical Research with a compensation programme for the general higher education competencies (level 2). They are also given the opportunity to complete the internship (course unit INTLIS12) by means of an independent examination.
The compensation program consists of following the workshops Professional skills where Conversation and feedback skills and Conflict management are discussed and the workshop Applying for internships / jobs. During the study coaching programme the students are guided in writing a PDP and reflection reports. If a student has already arranged an internship during his study at BRS, an exemption can be requested from the board of examiners for the Applying for internships/jobs workshop.
The compensation programme is sufficiently completed if the student
- has 2 sufficient assessments during tutor for chairman including agenda (Professional skills level 2 part A and B, LSPROA-TOETS03 (IPS) and LSPROB-TOETS03 (IPS)).
- has 2 sufficient assessments for minutes (Professional skills level 2 part A and B (LSPROA-TOETS03 (IPS) en LSPROB-TOETS03 (IPS)
- has written 2 PDPs, one at the beginning and one at the end of the first semester.
- has 2 performance interviews (Professional skills level 2 part A and B, LSPROA-TOETS04 (Performance review) en LSPROB-TOETS04 (Performance review)) and completed them with a reflection report.
- Has sufficiently completed the workshops Professional skills 1, 2 and 3 (LPO-PS1, LPO-PS2, LPO-PS3) and Applying for internships/jobs and discussed these during the performance appraisals (Professional skills level 2 part A and B, LSPROA-TOETS04 (Performance review) en LSPROB-TOETS04 (Performance review)).

The document 'Argumentation Double Degree LS - Applied Biology H BRS_revised January 2019' compares the competence development and knowledge development of the regular Life Science students and the double degree students of Hochschule Bonn-Rhein-Sieg.
Only the 2nd year of the Life Science/Biology and Medical Laboratory Research programme programme was compared because a comparison of the competences at levels 1 and 2 in the competence profile of the programme shows that the competence development in the second year (level 2) covers that of the first year (level 1). In the documents 'Relationship between competencies and part examinations level I' and 'Relationship between competencies and part examinations level II', which were made for the Life Science/Biology and Medical Laboratory Research programme, it has been made clear that all competencies with their corresponding indicators at levels 1 and 2 are tested in the part examinations of year 1 and year 2 respectively.
On the basis of the above, the board of examiners has decided to grant these students exemption from the propaedeutic exam, Molecular/Biochemical theory (LSMOLT) and practical (LSMOLP), Interactions theory (LSINTT) and practical (LSINTP) and the minor provided that the first two years of the 3-year Bachelor programme at Hochschule Bonn-Rhein-Sieg are completed.
After sufficient completion of the compensation programme, exemptions will be granted for the course units Professional Skills Level 2 Part A and B (LSPROA and LSPROB).
The aim of the internship and graduation project is to train students to work individually on a project in professional practice. Students learn to deal with a complex project and develop self-responsibility for their work. In addition, the theoretical understanding of the experiments in the context of the project will be developed.
Students of Bonn-Rhein-Sieg have a deeper and broader theoretical knowledge than regular Life Science students. They are also well trained to think in a broader context in processes with a high biological complexity. This additional knowledge makes it easier for Bonn-Rhein-Sieg students than regular Life Science students to understand the theoretical background of

experiments and place it in a broader context. They do not need the internship Life Sciences (INTLIS12) in order to be able to graduate (competence level 3) after the completion of course unit Biomedical research: cancer and developmental biology (CANDEV01)and the graduation project Life Sciences (GRAASL10).
On this basis, the board of examiners has decided that these students will be given the opportunity to complete the internship by means of a learning path independent examination. The examination takes place 6 weeks after the start of the internship, in which the student demonstrates that he meets the requirements of the internship according to the course unit INTLIS12 test program. If the examination is assessed with an insufficient grade, the student will continue his internship and at the end of the internship will be assessed according to the regular assessment of the course unit. For the graduation project (course unit GRAASL10) a new workplace has to be found.

Nijmegen, 27-6-2024

C.H. Smit, Chair, board of examiners ATBC

Appendix 4: Regulations for External Supervisors in exams at SABC 2024-2025

1. POSITION AND APPOINTMENT OF EXTERNAL SUPERVISORS

1.1 The board of examiners appoints one or more external experts (hereafter called 'external supervisors') for each of the degree courses within the school, as defined in article 3.5 of the board of examiners regulations. These experts are responsible for monitoring the quality of the final assessment for the Bachelor or Master degree course (hereafter called 'the final assessment').

1.2 An external supervisor is not a member of the Board of Examiners for the relevant degree course and does not work as a lecturer or examiner for the course department where he/she acts as an external supervisor.

2. DUTY OF EXTERNAL SUPERVISOR AND RELATED DUTIES

2.1 An external supervisor is responsible for judging the quality of the graduation project and reporting on this in writing to the board of examiners via the Quality Assurance Committee. The evaluation by the external supervisor concerns the following in particular:

A.	*The quality of exams and assessment*	Important aspects[1]: - validity (a), - reliability (b), - quality assurance and monitoring (c), - professional expertise of examiners (d).
B.	the quality of students (realization of the intended exit qualifications)	Important aspects: - competency level, - integration of theory and practice, - vision of professional practice, - suitability as an entry-level professional.
C.	*The organisational quality of the final assessment*	Important aspects: - applying relevant rules and provisions, - organisation of the final assessment, - providing information to students.

The external supervisor has no task as examiner of the products of the graduation project.

2.2 Relevant documents are made available to the external supervisor in a timely fashion – and if necessary explained further – by or on behalf of the board of examiners.

2.3 The Quality Assurance Committee and the Internship Bureau, in consultation with the external supervisor and the board of examiners, conduct a survey to evaluate the quality of the final assessment.

2.4 At least once every two years, the Quality Assurance Committee collects the findings of the external supervisors regarding the exams through a survey. In addition, external supervisors are invited to provide feedback on their own behalf.

2.5 The Internship Bureau ensures that the secretary of the relevant Board of examiners is informed in a timely fashion and in writing of the name(s) of the external supervisor(s), so that they may be appointed by the Board of examiners. .

2.6 The Board of examiners and the Internship Bureau from the relevant degree programme assists the external supervisor in carrying out his/her duties. This involves providing the opportunity for the external supervisor to:
- inspect, in a timely fashion, a representative sample of the final assessment/exam assignments and products, as well as their assessment;
- provide opportunity to attend one or more exams/final assessments;

2.7 Before November, the quality assurance committee sends a concise, written report based on the findings of the external supervisor on the final assessments of the *preceding academic year* to the board of examiners. If necessary, this report also gives suggestions for improving the quality of the assessments.

2.8 The board of examiners discusses the report referred to in 2.7 with the internship bureau and if applicable with the external supervisors. The board of examiners sends a report of this meeting to the external supervisors. The report of the quality control committee is attached to this report.

3. COMPETENCE PROFILE OF THE EXTERNAL SUPERVISOR

3.1 Knowledge:
- Is familiar with the current theory and practice of the professional fields relevant to the degree course.
- Is familiar with the exit qualifications for the relevant degree programme.
- Is familiar with the examination and assessment systems and the teaching methods used at Universities of Applied Sciences.

3.2 Skills:
- Capable of working/interacting in such a way that both students and examiners feel they are communicating with an expert in their field.
- Capable of assessing assignments and products for exams and final assessments in terms of relevance and consistency.
- Capable of evaluating research from a perspective – and relevant to – the professional field in question.
- Capable of giving a well-founded judgement on the content of the final assessment, as well as the knowledge, understanding, skills and attitudes (competences) of the student and can clearly justify his judgment.
- Capable of assessing examiners in terms of their method(s) of examining and assessing.

3.3 Attitude:
- Capable of empathising with students participating in a final assessment/exam interview.
- Confident in and capable of giving examiners and/or students constructive feedback.

3.4 Other conditions:
- Bachelor: Works at minimally HBO/Bachelor level or higher and holds a Master's degree. Master: Works at master level and holds a PhD.
- Several years of work experience in a profession relevant to the degree programme.
- Independent from the student and his graduation project.
- Willing and able to attend (a representative number of) exams/final assessments.

4. FEES

The external supervisor receives the standard financial compensation customary at the HAN. The dean ensures that the external supervisor is provided with expense claim forms for attendance fees and travel and accommodation costs. Payment of compensation is made by or on behalf of HAN.

5. ADOPTION AND EFFECTIVE DATE

These regulations were adopted on 27 June 2024 by the SABC board of examiners and shall enter into force on 1 September 2024.

Appendix 1: Additional details on the quality of examinations and assessments

Keyword: Validity	
Core questions	1. Does the degree course measure what it intends to measure? 2. What benchmark/cut-off points does the degree course use?
Intended results	- Learning outcomes (e.g. competences), operationalized at the exit and intermediate levels, are set out clearly[3] (e.g. by indicators) in such a way (e.g. in a schematic overview) that they are clear to all internal and external parties. - Assessment criteria and the standard (cut-off) per modular and final exam/assessment have been set out in a clear and transparent manner (i.e. with a recognizable link to the exit qualifications at the relevant level of proficiency).
Keyword: Reliability	
Core questions	3. Are all the assessors in agreement with one another? 4. How was this consensus reached (systematically or by chance)? 5. Are the considerations made to reach an agreement set out in a clear and transparent manner?
Intended results	- Systematic consultation should take place between assessors to reach agreement about procedures for administering and assessing examinations, the (interpretation of) assessment criteria and standards (i.e. cut-off points), and the assessment/feedback that will be given to students. - The organisational structure allows for systematic synchronization between internal and external assessors about procedures for exams, the (interpretation of) assessment criteria and standard (cut-off), and the feedback that must be given. - The considerations/arguments on the basis of which the judgement was reached are to be set out clearly after assessment (e.g. specified on assessment or feedback forms).
Keyword: quality and assurance	
Core questions	6. How is the quality of examination and assessment assured and monitored?
Intended results	- The procedures for examining and assessing the exit qualifications (per level of proficiency) have been set out clearly (i.e. without cause for discussion between assessors). - Procedures for the development of examination and assessment are set out in a clear and transparent manner. - A structure that aims systematically (i.e. now and in the future) to increase consensus between assessors is outlined (plan), carried out in this way (do), and works (check, act). - The role and responsibilities of the Board of examiners (and any other parties involved) in safeguarding and monitoring the quality of examinations and assessment are set out in a clear and transparent manner. - Competency requirements of internal and external examiners, supervisors and exam developers, and how to monitor and manage this (e.g. professional development, peer review), are set out in a clear and transparent manner.

[3] Set out clearly = reached in agreement, recorded (described in course documentation) and communicated

3 Regulations of the Degree Committee

HAN_UNIVERSITY OF APPLIED SCIENCES

Degree Committee Regulations

Chapter 1 Introductory provisions

Article 1 Status and definitions

1. These regulations are regulations as defined in the administrative and management regulations of HAN University of Applied Sciences (hereafter: HAN).
2. These regulations apply to the joint degree committee for the Bioinformatics, Life Sciences and Chemistry programmes.
3. The definitions and provisions from the Glossary in Appendix 1 to the Degree Statute apply to these regulations.

Chapter 2 Degree committee

Article 2 Establishing degree committee(s)

1. A degree committee will be established for each degree course or group of degree courses.
2. If a school has only one degree course, the duties and powers of the degree committee will be exercised by the school council.
3. If a degree committee is established for two or more degree courses, that degree committee will be referred to as a joint degree committee. The decision to establish or dissolve a joint degree committee will be taken by the dean, and it will require the consent of the school council of the relevant school. The school council consults the relevant degree committees regarding the decision whether or not to give its consent.
4. The provisions in these regulations also apply to joint degree committees, unless the nature of the provision precludes application.
5. One or more divisions may be set up within a degree committee if required. A division can be set up as needed according to the degree format, according to a special feature of the degree course (e.g. English-taught), according to the location of the degree course or according to any other special aspect of the degree course.
6. The degree committee for the degree courses Bioinformatics, Biology & Medical Laboratory Research and Chemistry has been established for a group of degree courses.

Article 3 Joint Assembly

If the degree courses of a school do not have a joint degree committee, all of the degree committees within that school will convene in a joint session at least 2 times a year to discuss shared matters. This will include at least those matters specified in article 27 paragraph 4 of these regulations

Article 4 Composition of the degree committee

1. The degree committee consists of 8 members.
2. Half of the members of the degree committee are students from the relevant degree course and the other half are staff from the relevant degree course.
3. No individual belonging to the school or course management or employed as an *education manager* can simultaneously be a member of the degree committee.

Article 5 Appointment term

1. Members of the Degree Committee that are appointed from and by the students, have 2-year terms. Members of the Degree Committee that from and by the staff are appointed, have 4-year terms.
2. The term begins on 1 September.
3. All members step down simultaneously at the end of their terms.
4. At the end of their terms, members of a degree committee may be re-appointed, on the understanding that members appointed from among and by the staff may serve for two consecutive terms and may not be re-appointed again after those two terms until they have had a one-term break from serving on the committee. The members who are appointed from among and by the students can be reappointed with a maximum of four consecutive academic years.

Article 6 Termination of membership

1. Membership in a degree committee will end:
   a. when the term expires, unless the member is re-appointed;
   b. before the end of the term:
      - in the event of death;
      - in the event the composition of the degree committee no longer meets the requirements specified in these regulations;
      - in the event the lecturer is no longer employed at the relevant school or no longer affiliated with the relevant degree course;
      - in the event the student member has quit the degree course.
2. A member of the degree committee may terminate the membership at any time by withdrawing the membership in writing, stating the reason, to the relevant dean.

Article 7 Composition

1. The composition of the degree committee is determined through nomination and appointment.
2. The method for determining the composition is considered each year.

Chapter 3 Elections

Not applicable

Chapter 4 Appointment

Article 16 Appointment

The members of the degree committee are appointed by the dean.

Article 17 Procedure

1. Before the end of term, the student representatives of the degree committee will submit four students from each degree course (belonging to the group of degree courses) to the dean for nomination, with due consideration of article 4. The submission will be compiled by the degree committee of the relevant degree course(s), or on behalf of the dean.
2. Before the end of term, the members of the degree committee's staff division will submit four staff members from each degree course (belonging to the group of degree courses) to the management for nomination for the coming term, with due consideration of article 4. The submission will be compiled by the degree committee of the relevant degree course(s), or on behalf of the dean.
3. If no joint degree committee has been established for a school's degree courses, each separate degree committee belonging to that school will choose one staff member and one student from among its members to be delegated to the joint assembly, together with the chair.

Article 18 Interim appointment

1. In the event of an interim vacancy on a degree committee or division, the dean will appoint a replacement member. The appointment procedure specified in article 17 will be followed.
2. The replacement member must be appointed within 4 weeks of the opening of the interim vacancy.
3. The interim replacement member steps down at the same time that the person being replaced would have stepped down.

Chapter 5 Positions and performance

Article 19 Positions

1. The degree committee and division elect one of their members as chair and a deputy.
2. A degree committee will be represented by either the chair or the deputy.

Article 20 Decision-making

1. The degree committee will take decisions by a simple majority of votes. Abstentions will not be counted. Votes may be held only if a majority of the members are present at the meeting.
2. Voting takes place without the presence of management or the discussion partner.
3. The members of the degree committee advise and vote independently and unbound by any instructions.
4. In the event of absence, the absent member may vote by proxy. Proxies are submitted in writing at the beginning of the meeting. A member may be appointed by only one other member. The appointed votes without charge or consultation. Proxies are counted when determining the quorum for the meeting.
5. Anyone who is involved in performing the duties of the committee and who therefore has access to information that is known to be or could be reasonably expected to be of a confidential nature will be bound to confidentiality.
6. Where applicable, the degree committee will ensure that the viewpoints represented by the minority of the votes cast are also communicated to the dean.

7. The degree committee will ensure that its resolutions, recommendations and proposals are available for inspection in a place accessible to the lecturers and students of the relevant degree committee or school.

Article 21 Meetings

1. The degree committee will meet at least eight times a year and also at any time at least half of the members of the degree committee request a meeting. Meetings are called by the chair of the degree committee. At the first meeting, a meeting schedule will be compiled in consultation with the dean, and will be posted on the website of the degree course.
2. The members of the degree committee will receive a written invitation to the meeting no later than five working days before the meeting. The invitation will be accompanied by an agenda.
3. The meeting documents will be sent to the members of the degree committee no later than four working days before the meeting. If the documents are sent later, the members may decide by majority of votes not to address the meeting documents.
4. The degree committee may request information from experts during the meeting. The secretary will be informed about the expert at least seven days before the meeting.
5. The degree committee may compose a temporary committee from among its members in order to prepare a topic. This committee will report to the degree committee.

Article 22 Public nature of meetings

1. The meetings of the degree committee will be public unless the degree committee decides otherwise. The degree committee [or division thereof] will determine whether to hold a closed meeting in preparation for a public meeting. No resolutions may be passed in closed meetings.
2. The degree committee must hold at least two public meetings a year. The dates of the public meetings will be scheduled in consultation with the dean and in concurrence with the official HAN academic calendar.

Article 23 Reporting procedure

1. The Degree Committee is supported by an official secretary who is responsible for taking and publishing the minutes.
2. The minutes must contain at least:
   - the date, time and location of the meeting;
   - the names of the members who are present at and absent from the meeting;
   - the agenda items;
   - the main discussion points;
   - any explanations of votes;
   - the recommendations;
   - the resolutions concerning recommendations, any votes taken on these recommendations and the results of the votes;

3. A draft version of the report will be sent to the members of the degree committee no later than 15 working days after the meeting, after which the report will be confirmed in the subsequent meeting.
4. The reports of the public meetings of the degree committee will be made available in digital format to the lecturers and students of the school or relevant degree course.

Article 24 Contact with management

1. The dean for the relevant degree format/course with special feature will promptly and without request provide the degree committee with all information they might reasonably or justly need to fulfil their duties. Upon request, they will promptly provide the degree committee *or* division thereof with all information the committee may reasonably or fairly deem necessary to fulfil its duties.
2. At least twice a year, the degree committee is authorized to invite the dean to discuss the intended policy based on the agenda that it has prepared.
3. At the opening of the academic year, the degree committee will prepare a policy plan with its key policy points for the coming academic year. The policy plan is then shared with the dean.
4. At the request of the dean, their designated deputy or at the request of the degree committee, the dean or their designated deputy will attend the meetings or parts of the meetings of the degree committee.
5. The dean will be responsible for ensuring the students and staff of the relevant school are sufficiently informed of the existence and performance of the degree committee.

Article 25 Annual reporting procedure

1. No later than November of each year, the chair of the degree committee will submit a written report to the dean concerning the duties and performance of the degree committee during the previous academic year. The chair will forward the report to the school council for inspection.
2. The report will contain information on at least the following points:
   - the composition of the degree committee;
   - the degree committee's vision on its duties and procedures;
   - the degree committee's policy plan and evaluation of its policy plan;
   - the recommendations and resolutions issued by the degree committee, including requests for consent;
   - the board's reaction to the recommendations and resolutions;
   - conclusions and recommendations.
3. The written report referred to in paragraphs 1 and 2 must at any rate be made available digitally and, if requested, in hard-copy format to the staff and students of the school or degree course(s) concerned.

Article 26 Contact with school council

The chair of the degree committee will ensure that consultation with the school council (or its chair) is held as needed.

Chapter 6 Duties and powers of the degree committee

Article 27 Duties of the degree committee

1. The degree committee has the duty to advise on the promotion and safeguarding of the quality of the degree course.
2. The degree committee is also charged with the following duties:
   - annually assessing the operational methods of the education and examination regulations (EER) of the relevant degree course;

- advising or issuing proposals to the school council and the dean on all other matters concerning education in the relevant degree course(s) when requested or on its own initiative.

3. A division of the degree committee will be charged with advising the degree committee on the following:
   - promoting and safeguarding the quality of the degree course;
   - annually assessing the implementation methods of the EER of the relevant degree course;
   - advising or issuing proposals to the degree committee on all other matters concerning education in the relevant degree course(s) when requested or upon its own initiative.
4. The joint meeting has the following duties:
   - discussing the separate recommendations about the EER made by the degree committees belonging to a school so they can reach a joint resolution in the event the EER is adopted at school level;
   - discussing the separate evaluations of the degree courses concerning the implementation of the EER to reach a resolution on the implementation of the EER at the school level;
   - advising or issuing proposals to the dean and/or school council on all other matters concerning education in the relevant degree course(s) when requested or on its own initiative.

Article 28 Right of consent

1. The degree committee has right of consent concerning the administrative and management regulations in so far as they:
   - specify a manner of composition other than election for the degree committee;
   - concern the annual assessment of the appropriateness of this other method of composition;
2. The degree committee has right of consent concerning the EER of the relevant degree course in so far as they concern:
   - the manner in which education is evaluated within the relevant degree course;
   - the content of the graduation specializations within a degree course;
   - the quality of the knowledge, understanding and skills that students should have acquired upon completion of the degree course;
   - where needed, the organization of practical exercises;
   - the study load of the degree course and each of its units of study and units of learning outcomes;
   - if applicable, the selection procedure for students applying for a special track within a degree course that aims at helping students attain a higher level of knowledge;
   - if applicable, the regulation that stipulates that the study load for a fast track aimed at students with a VWO diploma is 240 instead of 180 credits.

Article 29 Advisory rights

The degree committee has advisory rights concerning the EER of the relevant degree course in so far as it concerns:

- the content of the degree course and the exams associated with it;

- any further rules on issuing study advice for the propaedeutic phase for the bachelor degree or the first year of study of an associate degree and further rules on issuing referrals in the propaedeutic phase/first year of study if a degree includes more than a graduation specialization after the propaedeutic phase/first year of study;
- the number and order of exams, as well as the times at which they can be administered;
- the full-time, part-time or work-study structure of the degree course;
- where necessary, the order in which, time frame within which and number of times each academic year that students are to be offered the opportunity to take exams and final assessments;
- where necessary, the extension of the validity term of passed exams, subject to the authority of the board of examiners;
- the method used to administer exams, whether orally, in writing or otherwise, subject to the authority of the board of examiners to decide on a different method in special cases;
- the manner in which students with disabilities or chronic illnesses are to be given the opportunity to take the exams;
- the public character of exams that are to be administered orally, subject to the authority of the board of examiners to decide differently in special cases;
- the time frame within which the results of an exam are to be posted, along with circumstances under which exceptions may be made to this time frame;
- the manner and term in which individuals who have taken a written exam will be allowed to review their work after it has been assessed;
- the manner and term in which questions and assignments made or given as part of a written exam may be reviewed, as well as the standards according to which the assessment was performed;
- the grounds upon which the board of examiners may grant exemptions for one or more exams based on previously passed exams or final assessments in higher education or based on knowledge and skills acquired outside the context of higher education;
- where necessary, the requirement to pass certain exams before admission can be granted to take other exams;
- where necessary, the requirement to participate in practical exercises for the purposes of admission to taking the relevant exam, subject to the authority of the board of examiners to grant exemptions from this requirement, whether or not that is conditional upon alternative requirements;
- the monitoring of study progress and individual study coaching;
- the actual design of the education.

Article 30 Conditions for consent and advice

1. The dean will ensure that:
   a. advice is requested at such a time that it can actually bear an influence on the decision-making,
   b. the committee has the opportunity to consult with the dean before the advice is issued,
   c. the committee is notified in writing as quickly as possible concerning the manner in which the advice will be acted upon.

Article 31 Procedure for consent and advice

1. The degree committee notifies the dean in writing about whether the degree committee has granted consent or what the degree committee's advice is as soon as possible, but no later than 6 weeks after consent or advice has been requested.
2. The degree committee and the dean may agree to extend the term specified in the preceding paragraph, or to shorten it due to the urgency of the decision to be taken or if the decision to be taken is required in order to comply with a legal prescription.
3. If the degree committee has not notified the dean of its advice or decision concerning the requested consent within the term referred to in paragraph 1 of this article, or within the extended or shortened term, the degree committee will be regarded as not having exercised its powers.
4. The degree committee may consult with students and/or staff members from the relevant degree course prior to deciding on a request for consent or before issuing advice.

Article 32 Deviating from advice

1. If the dean does not wish to follow all or part of the advice given by the degree committee, the dean will notify the degree committee of this, along with the reasons, within four weeks.
2. The dean will ensure that the degree committee has the opportunity to engage in further consultation with him or her before making a definite decision.
3. The dean will suspend the execution of his or her decision for 4 weeks after the day on which the degree committee announced its decision, unless the committee has no objection to the immediate execution of the decision.
4. The dean will notify the degree committee and school council in writing of the definite decision, noting that the decision deviates from the degree committee's recommendation.

Article 33 Right of initiative

1. If the degree committee makes a proposal to the school council or dean as referred to in article 27 paragraph 2 of these regulations, upon request or at its own initiative, the dean will respond to the proposal within two months of receipt. The degree committee will send these recommendations and proposals to the participation council or the relevant school council for inspection.

Chapter 7 Quality assurance

Article 34

1. At the opening of the academic year, the degree committee and the dean make agreements concerning the manner in which quality assurance is performed.
   The Quality Care Committee is responsible for performing the evaluation process of education. The degree committee is involved in the large improvement plans that result from these evaluations.

Chapter 8 Involvement in accreditation

Article 35

In the context and for purposes of the accreditation of the degree course:

- the degree committee provides a recommendation for the self-evaluation of the degree course upon request by the dean;
- in certain cases the degree committee has advisory rights with regard to the recovery plan.

Chapter 9 Disputes

Article 36 Access to the Disputes Advisory Committee

The disputes committee for participation will inspect disputes between the degree committee or the dean with regard to:

a. the application of the regulations of the degree committee;
b. disputes arising from articles 27 to 30 of these regulations.

Article 37 Amicable settlement

In the event of a dispute between the degree committee and dean, the Executive Board will investigate the possibility of amicable settlement. If this is not possible, the dean or the degree committee will submit the dispute to the Disputes Advisory Committee.

Article 38 Binding judgment of the Disputes Advisory Committee

The disputes committee is authorized to effect an amicable settlement between parties. If they are unable to reach an amicable settlement, the disputes committee will resolve the dispute by issuing a binding judgement after assessing whether:

a. the dean has adhered to the requirements of the law and the internal regulations for degree committees;
b. the dean could have reasonably reached the proposal or decision when considering the interests involved;
c. the dean has acted negligently with regard to the degree committee.

Article 39 Suspended execution of a decision

If the dispute concerns the choice whether or not to follow the advice or part of the advice given by the degree committee, the execution of that decision will be suspended for four weeks, unless the degree committee has no objection to the immediate execution of the decision.

Article 40 Permission in the absence of consent

If the dean has not received consent from the degree committee for an intended decision, the dean may request permission from the disputes committee to make the decision, contrary to the provisions of article 31. The disputes committee will only grant permission if the decision of the degree committee

not to provide consent is unreasonable or if compelling organizational, economic or social reasons call for the intended decision of the dean.

Chapter 10 Facilities

Article 41 Facilities for degree committees (and their members)

1. The dean will grant the degree committee the use of facilities that are available and that the committee could reasonably need to fulfil its duties, including at least administrative, financial and legal support.
2. More specifically, the degree committee is entitled to:
   - meeting space;
   - facilities for the reproduction/distribution of meeting documents;
   - secretarial support;
   - catering facilities;
3. The dean will allocate a training budget to the members of the degree committee. The training budget is determined at the start of the academic year by mutual agreement between the degree committee and the dean and enables the members of the degree committee to participate in the professional development courses offered by the HAN Academy. The training budget for the joint degree committee amounts to 2000 euros per academic year
4. The members of the degree committee who are employed as staff members will have the opportunity to participate in this training during working hours and with retention of salary.
5. The dean will give the degree committees the opportunity to meet during working hours whenever possible. Each student and staff member of the degree committee will be facilitated for all degree committee activities for 80 hours each academic year, which includes 16 training hours, with the position of chair receiving additional facilitation of 40 hours each academic year.

Chapter 11 Final provisions

Article 42 Legal protection

The Executive Board, the dean and the school manager of the relevant degree format/degree course (with a special feature) will ensure that the members of the degree committee, *the division* and the members of the joint assembly are not disadvantaged in their position and/or interests in relation to the university of applied sciences on account of their membership in the degree committee.

Article 43 Unforeseen circumstances

Matters that are not provided for in these regulations and for which an immediate decision is needed by the degree committee, division or joint assembly will be decided upon by the chair of the degree committee or the chair of the joint assembly. The chair must communicate this decision as soon as possible to the other members of the degree committee (*or division thereof*) or the other members of the joint assembly, and to the dean.

Article 44 Effective date

These regulations were adopted by the dean on 11 July 2024 and will come into effect on 1 September 2024.

HAN_UNIVERSITY OF APPLIED SCIENCES

Appendix to chapter 6 description of the education

HAN_UNIVERSITY OF APPLIED SCIENCES

HAN_UNIVERSITY APPLIED

Master Molecular Life Sciences 2024-2025

Details of the units of study

In accordance with article 4.1 paragraph 1 of the Education and Examination Regulations

Contents

HAN_UNIVERSITY OF APPLIED SCIENCES

Fundamentals Module

Title of UOS	***Fundamentals*** ***FUNDAM10 (PT) / FUNDAM05 (FT)***
Degree Programme	Master in Molecular Life Sciences
Target group	Students enrolled in Master in Molecular Life Sciences
Title of UOS	Fundamentals
Code OSIRIS	FUNDAM10 (PT) / FUNDAM05 (FT)
Registering for educational components	See Part 3 'OSIRIS Regulations for Education, Exams and Modular Exams' for more information.
Professional task	2. to apply fundamental knowledge in the area of molecular life sciences to find sustainable solutions for these needs
(Professional) Products	• Assignments to apply the Body of Knowledge and Skills and to train fundamental research skills
Credits	7 EC
Relationship with and entry requirements concerning exams	• none
General description	The unit of study Fundamentals aims to refresh and extend a bachelor's knowledge and skills in bio-molecular research & development. Subjects include molecular biology, cell biology, biochemistry, statistics and the basics of bioinformatics. Special focus is on the techniques used in the field. Reading, understanding and critically analysing scientific articles are the subject of the unit of study as well. 2-weekly assignments on various subject areas will support students in (re)acquiring the knowledge and skills and in becoming familiar with the education programme. At the end of the module, all students have the fundamental knowledge and skills at post-Bachelor level that help them to subsequently acquire the knowledge, skills and competencies characteristic for this master in the following units of study.
Competences	**Competence 3: Design, analysis and control of experiments**
Assessment criteria/	***See exams of the UOS Introduction below this table***
Exams	***See exams of the UOS Introduction below this table***
Compulsory literature	❖ Reader Fundamentals ❖ Original research articles are provided with the weekly assignments
Recommended literature	❖ Alberts, Johnson, Lewis, Morgan, Raff, Roberts, and Walter, (2022). *Molecular Biology of the Cell*. (7th edition). Garland Science: ❖ Reed, Weyers & Jones (2016): *Practical Skills in Biomolecular Science.* Pearson ❖ Berg, J.M., Tymoczko, G. Gatto J., Stryer, L. (2015 or 2019). Biochemistry. (8th or 9th edition). W.H. Freeman. ❖ Samuel, M.L., Witmer, J.A., & Schaffner, A. (2011 or 2015). *Statistics for the Life Sciences.* (4th or 5th edition). Pearson.

	❖ Pevsner, J. (2015) Bio-informatics and Functional Genomics Wiley Blackwell
Software and other materials	Computer and internet connection SPSS software
Activities	<u>Introduction to the programme and the facilities</u> On the first day, a short introduction of students and lecturers, the way of learning and the facilities takes place. <u>Assignments and homework</u> The student prepares (mostly bi-weekly) assignments and discusses these in class, supported by a lecturer. These assignments cover a large part of the Body of Knowledge and Skills of this unit of study. In addition, various research skills are trained with these assignments. This way, students prepare themselves for the theoretical exam, the formal assessment of this module. Each assignment is introduced, and a theoretical framework is provided. Students independently study the theoretical aspects and apply the various topics in the homework assignment. Homework assignments are discussed in class to provide students with feedback. <u>Topics:</u> - Methods in biochemistry, molecular and cell biology - The genome & genome editing - Properties of biomolecules - Regulation and manipulation of gene expression in prokaryotes and eukaryotes - Signal transduction - Cell cycle - Intracellular trafficking - Cell metabolism - Statistics: Introduction and basic statistics for biological data analysis - Data Science: using life science databases, analysis of omics data and sequence comparisons to answer questions <u>Social programme:</u> A social programme is part of this unit of study. During this programme, students and teachers can get to know each other personally and have fun together. The activity will be a surprise!
Work formats	lecture, tutorial, presentation, assignment
Lesson / Contact hours	60
Compulsory participation	- Start assessment - Presentations of Assignments
Education period	P1N (August - November 2024)
Maximum number of participants	-

Exam of the UOS Fundamentals

<table>
<tr><td></td><td colspan="3">Assessment criteria/ Indicators / requirements</td></tr>
<tr><td></td><td>Competence indicators</td><td>Body of Knowledge and Skills</td><td>Assessment criteria</td></tr>
<tr><td>Code modular exam:
TOETS-01</td><td>Competence indicators</td><td>Knowledge indicators</td><td>In the theoretical exam, these competence and knowledge criteria are translated into the following assessment criteria:</td></tr>
<tr><td>Name modular exam:
Exam

Type:
KENN-F (Knowledge exam on location/ written)

Assessment:
Grade
Cut-off value:
55%
Minimal result:
5.5
Weighting:
100%
Period and resit:

YEAR:2 (November 2024 and March 2025)

Compensation:
None</td><td>Competence indicators
3.1 (intermediate level): Designs experiments based on the required quality and quantity of the product or result.
→ In the exam, the student can design experiments based on a research question.
3.2 (intermediate level): Applies strict logical thinking to draw conclusions from the results:
- in the context of the experiments
- in comparison to other analyses, reference/theoretical values, and quality requirements.</td><td>Knowledge criteria – Application of techniques in this exam implies the design of experiments or interpretation of data
• has knowledge and insight of genes, chromosomes, plasmids mutations / SNPs
• has knowledge and understanding of the principle of all standard techniques to detect DNA (such as PCR, FISH, (next generation) sequencing), RNA (such as(q) RT-PCR, expression array, RNAseq, in situ hybridisation) and proteins (such as SDS-PAGE, Western blot, immunocytochemistry, immunohistochemistry, protein array, mass spec) and to detect the interaction between biomolecules (e.g. immune-precipitation, chromatin-immunoprecipitation) and can apply the appropriate technique to answer a question about the presence, quantity, alteration/modification, localization or interaction of DNA, RNA or protein</td><td>The student is able to
• Design experiments (20-25%)
• Explain theoretical background (15%-20%)
• Explain research aims (5-10%)
• Explain experimental methods (10-15%)
• Explain, analyse and interpret results (25-30%)
• Draw conclusion based on experimental results (5-10%)
<u>Knowledge indicators</u>
• 5-10% statistics
• 20-45% molecular biology
• 20-40% cell biology</td></tr>
</table>

		• understands how gene expression is regulated in prokaryotes and eukaryotes and applies this knowledge to heterologous gene expression • is able to design a strategy for gene cloning and heterologous expression • has knowledge and understanding of the mechanisms of gene silencing by siRNA and is able to apply siRNA to downregulate gene expression • is able to design a (conditional) knock-out strategy (e.g. by CRISPR-Cas) • is able to explain the composition and functions of prokaryotic and eukaryotic cells, function of organelles, cell cycle regulation, DNA repair, signal transduction, protein modification and localization • has knowledge and understanding of the principle of techniques to analyse cell proliferation, cell cycle, apoptosis, protein modification and can apply these techniques to answer questions on such cellular functions • has knowledge and understanding of the properties of proteins, nucleic acids (DNA, RNA), sugars, lipids, endotoxin, salt, viruses and bacteria • has knowledge and understanding of biomolecule purification methods (such as size exclusion chromatography, ion exchange, hydrophobic interaction, ultrafiltration, affinity chromatography, precipitation, filtration, drying) and is able to choose a purification method depending on the composition of the original sample	• 20-40% biochemistry In addition, the student has made the homework assignments regarding three Data Science cases.

		and the biomolecule to be purified • has knowledge and understanding of methods to analyse biomolecules (such as NMR, chromatography, enzyme assays, ultrafiltration, absorption measurement, selective breakdown, enzyme immune-assay) and is able to choose an analytical method based on the biomolecule(s) to be analysed • has knowledge and understanding of metabolic pathways, cell chemistry and biosynthesis and can apply this knowledge to optimise metabolite production (metabolic engineering) • has insights into the principles, advantages and disadvantages of different diagnostic tests, e.g. serology and molecular diagnostics Statistics • understands the meaning of: statistical hypotheses, type of variable (continuous / categorical), association versus causation, confounding variables, variation, normal distribution, population versus sample, dependent and independent observations, Type I and Type II error, descriptive statistics, the relationship between central tendency (mean, median) and variance, p-value and statistical significance, log-transformation, one- or two-sided tests, multiple testing problems and its solutions • is able to translate the research	

		question into an appropriate statistical question, experimental setup and corresponding statistical analysis • has awareness of power and sample size calculations • is able to choose the appropriate statistical method for data Analysis, including t-test, ANOVA, multiple regression, chi-square tests • is able to report the results with tables and graphics Data Science: Data Mining: • is familiar with the most prominent biological databases and their general structure (e.g. NCBI, KEGG) • is able to formulate a biological question in terms of data and a data integration workflow Data Science: Function annotation (DNA and protein sequences): • is able to use the principles of transcription, mRNA processing, translation, post-translational modifications and protein structure/domains to evaluate the function annotation of a nucleotide and/or protein sequence. • is able to perform BLAST-searches and evaluates the results	

HAN_UNIVERSITY OF APPLIED SCIENCES

Drug Development

Title of UOS	***Drug development*** ***DRUGDE07 (PT) / DRUGDE05 (FT)***
Programme	Master in Molecular Life Sciences
Target group	Students enrolled in Master in Molecular Life Sciences programme
Title of UOS	Drug Discovery and Development
Code OSIRIS	DRUGDE07 (PT) / DRUGDE05 (FT)
Registering for educational components	See Part 3 'OSIRIS Regulations for Education, Exams and Modular Exams' for more information.
Professional task	1. to understand practical, economic, social and/or ecological needs of businesses, market and society that can be anticipated by biotechnology 2. to apply fundamental knowledge in the area of molecular life sciences to find sustainable solutions for these needs
Professional Products	• High-throughput data analysis • Poster on a drug discovery strategy
Credits	10 EC
Cohesion and admission requirements relating to exams	• All assessments of this unit of study have to be sufficient.
General description	During this unit of study, students acquire knowledge in the principle of pharmaceutical chemistry and skills in different stages of drug development by designing strategies in drug discovery, development and delivery. The assignments are placed in the context of drug development, predominantly cancer. Students acquire knowledge and understanding of the diverse molecular and cellular processes involved in cancer development and the multiple strategies to fight the disease. Industry professionals talk about current R&D in the field of fighting cancer. Prognostic tests for treatment outcomes resulting in personal medicine are addressed, as well as advanced 'omics technologies used in the field. The data analysis in this unit of study focuses on the analysis of data from high throughput screenings. Understanding drug design and drug properties is necessary to complete a production strategy. To this end, students study in an online environment principles of pharmaceutical chemistry during this unit of study. Moreover, they will be trained in understanding the analysis methods used to investigate the structure-related properties of different types of drugs.
Competences	**Competence 2: Designing strategies for applied research and product development** **Competence 3: Design, analysis and control of experiments** Competence 4: Communication Competence 5: Managing projects Competence 6: Advising
Assessment criteria/	***See exams of the UOS Drug Discovery and Development below this table***

Indicators / requirements for the UOS.	
Exams	***See exams of the UOS Drug Discovery and Development below this table***
Required reading	❖ Reader Drug Development ❖ Supporting High-throughput data analysis and interpretation, and Drug Discovery strategy: - Tamborero et al (2018).Cancer Genome Interpreter annotates the biological and clinical relevance of tumor alterations *Genome Medicine,* 10:25 - Santarius, T. et al. (2010). A census of amplified and overexpressed human cancer genes. *Nature Reviews Cancer, 10* (1), 59-64. - Yates, L.R. & Campbell, P.J. (2012). Evolution of the Cancer Genome. *Nat Rev Genet, 13* (11), 795-806. - The Cancer Genome Atlas Network (2012). Comprehensive molecular characterization of human colon and rectal cancer. *Nature*, 487, 330-337. - Zhang *et al,*. (2019). A survey and evaluation of Web-based tools/databases for variant analysis of TCGA data. Briefings in Bioinformatics, 20(4), 1524-1541.
Recommended reading	❖ Alberts, Johnson, Lewis, Morgan, Raff, Roberts, and Walter, (2022). *Molecular Biology of the Cell*. (7th edition). Garland Science. ❖ Lodge, Lund & Minchin (2007): *Gene Cloning, Principles and Applications.* Tayler & Francis Group ❖ Berg, J.M., Tymoczko, J., Stryer, L. (2019). Biochemistry. (9th edition). W.H. Freeman. ❖ Samuel, M.L., Witmer, J.A., & Schaffner, A. (2015). *Statistics for the Life Sciences.* (5th edition). Pearson. ❖ *Pevsner J. (2015) Bioinformatics and Functional Genomics. (*3rd edition). Wiley ❖ The *International Conference on Harmonisation* of Technical Requirements for Registration of Pharmaceuticals for Human Use (2000) SAFETY PHARMACOLOGY STUDIES FOR HUMAN PHARMACEUTICALS S7A ❖ The *International Conference on Harmonisation* of Technical Requirements for Registration of Pharmaceuticals for Human Use (2005) THE NON-CLINICAL EVALUATION OF THE POTENTIAL FOR DELAYED VENTRICULAR REPOLARIZATION (QT INTERVAL PROLONGATION) BY HUMAN PHARMACEUTICALS S7B ❖ Original Research articles relevant to the assignments

	The reading lists are updated regularly. Therefore, the actual reading list for the unit of study might deviate from the list presented above.
Software and other materials	Computer and internet connection
Activities	During this unit of study, students will individually work on their assignments (see also assessment). The supporting education programme will help students work out their assignments and master the exam, and therefore achieve their learning goals. <u>Lectures:</u> • Introduction unit of study and assignments • Molecular mechanisms in cancer development, cancer diagnosis, cancer drugs • Models to study cancer drugs; assays for drug testing • A short overview of clinical trials • Lectures on R&D projects by guest lecturers • Registration of drugs • Structure elucidation analyses. <u>Online lectures</u> • Drug action and drug discovery • Drug design principles • Introduction to pharmacokinetics and drug biotransformation • Drug development, production, and regulation • General principles of pharmaceutical chemistry <u>Workshops:</u> • Cancer drugs/cancer drug development • Statistics: multiplicity tests and ANCOVA <u>Trainings:</u> • Analysing High-throughput drug screens
Instructional formats	Assignment, (Guest) Lecture, Tutorial
Teaching / Contact hours	148 contact hours: ~50 contact hours (lectures, workshops and (computer) trainings) 98 contact and online studying at University of Florida
Mandatory participation	• Assessments
Period of instruction	P2N (December 2024 – April 2025)
Maximum number of participants	-

Exam of the UOS Drug Discovery and Development

<table>
<tr><td></td><td colspan="3">Assessment criteria/ Indicators / requirements</td></tr>
<tr><td></td><td>Competence indicators</td><td>Body of Knowledge and Skills</td><td>Assessment criteria</td></tr>
<tr><td>Code modular exam:
TOETS-01</td><td>Competence indicators</td><td>Knowledge indicators</td><td>These competence and knowledge criteria are translated into the following assessment criteria*</td></tr>
<tr><td>Name modular exam:
Fundamentals in Pharmaceutical Chemistry

Type:
KENN-O (Online/digital knowledge exam)

Assessment:
Grade;
Conversion of grades from University of Florida (US):
US HAN
E 0
D 5.5
C 6
B- 6.5
B+ 7
A- 7.5</td><td>2.1. Is able to independently acquire knowledge in a new subject by consulting specific literature and other resources; is able to identify reliable and suitable sources; Discriminates between major and side issues
2.2. Combines information from different sources in the context of the own project
2.3. Defines the project aim in terms of products and/or results based on the acquired background information
2.4. Defines the quality requirements for products and processes based on legal requirements.
2.5. Designs different approaches that could lead to the project aim. Evaluates these possibilities and justifies the choice based on scientific arguments and practical parameters such as time, costs, quality and personnel</td><td>• understands the principles of pharmacology, pharmacokinetics & drug-biotransformation, and pharmacodynamics
• knows and understands drug design principles
• knows and understands the principle of different types of drugs and treatment approaches (such as small molecules, antibodies, gene therapy, antibiotics and anti-virals, chemotherapy, radiotherapy), their advantages and disadvantages.
• is able to choose one type of drug as active pharmaceutical ingredient depending on desired biological effect
• is able to choose a delivery system based on desired selectivity and bio-availability
• knows that structure-analysis can be used to predict the function of the biomolecule and to discover interaction partners/ drugs
• knows the different phases of clinical studies
• is able to define quality requirements</td><td>Written assay module assignment and timed quizzes are applied to assess the following criteria:
<u>Drug Action and Drug Discovery</u>
- Understand the sources for new lead structures
- Describe the LADME process
- Define the terms pharmacokinetics and pharmacodynamics
- Evaluate a structure in terms of physicochemical properties
- Be able to calculate the logP using the π value equation
- Apply Lipinski’s rule of five and the degree of ionization to predict the behaviour of a substance in solution
- Define the terms acid and base
<u>Drug Design Principles</u>
- Understand the terms ED50, therapeutic index, certain safety factor, log-dose response curve, and Lineweaver-Burke plot
- Relate the principle of a pharmacophore to structure activity relationship, functional group substitutions, and stereochemistry
- Analyse a structure according to</td></tr>
</table>

A (90.0-92.5%) 8 A (92.5-95.0%) 8.5 A (95.0-97.5%) 9 A (97.5-99.9%) 9.5 ***Cut-off value:*** 55% ***Minimal result:*** 5.5 ***Weighting:*** 35% ***Period and resit:*** YEAR:2 (April 2025, second chance in agreement with University of Florida and student) ***Compensation:*** None ***Enrollment:***		for products and processes based on regulatory guidelines • is aware of the requirements for entering the clinical phase and for market entry	electronic and steric effects - Present a basic understanding of quantitative structure-activity relationship (QSAR) principles - Combine their knowledge of lessons 1 and 2 to synthesize and analyse a drug structure Introduction to Pharmacokinetics & Drug Biotransformation - Understand and be able to explain the pharmacokinetic terms half-life, volume of distribution, first-order kinetics, zero-order kinetics, linear and non-linear kinetics, area under the curve (AUC), one- and multi-compartment models - Describe the differences between drug administration and pharmacokinetic behaviour following enteral and parenteral routes - Distinguish between one-compartment and multicompartment pharmacokinetic models - Explain the functions of biotransformation and the impact it has on bioavailability and activity of a drug Apply the concepts of phase I and phase II metabolism - Predict the potential routes of metabolism for a drug based on structure and knowledge of the various metabolic enzymes involved in phase I and phase II metabolism Drug Development, Production, and Regulation - Describe the past and current legislation regulating drug products in the US - Explain the stages of drug

			development - Distinguish between preclinical and clinical drug testing and its purposes - Differentiate between the regulatory authority of the FDA for marketed drug products - Understand the basics of patent protection for a drug product Comprehensive HyLighter assignment - Apply knowledge learned throughout the course to the development of a new drug entity - Transfer knowledge and research information specific to a drug used in therapy For details, see the Syllabus PHA6432 Fundamentals of Pharmaceutical Chemistry of the University of Florida.

Code OSIRIS: **TOETS-02** **Name:** **Structure Elucidation Analysis** ***Type:*** PROD-O (Online/digital (professional) product) ***Assessment:*** Grade ***Cut-off value:*** 55% ***Minimal result:*** 5.5 ***Weighting:*** 30% ***Period and resit:*** YEAR:2 (April 2025 and June 2025) ***Compensation:*** None ***Enrollment:***	2.1 Is able to independently acquire knowledge in a new subject by consulting specific literature and other resources; is able to identify reliable and suitable sources; Discriminates between major and side issues 2.2. Combines information from different sources in the context of the own project.	• Is familiar with the analytical procedures of IR, MS, and NMR and understand the theory of how each technique • understand the differences and specific advantages and disadvantages of each analytical technique introduced in this course	See assessment form 'Structure Elucidation Analysis' on #OnderwijsOnline - General Information and in the Reader Drug Discovery and Development
	Competence indicators	***Knowledge indicators***	***For this assignment, these indicators and knowledge criteria are translated into the following assessment criteria***
Code modular exam: **TOETS-03** ***Name modular exam:*** **Poster Presentation on Drug Discovery Strategy** ***Type:*** PRES-F (Presentation	2.1. Is able to independently acquire knowledge in a new subject by consulting specific literature and other resources; is able to identify reliable and suitable sources; Discriminates between major and side issues; 2.2. Combines information from	• has knowledge and understanding of the principle of all standard techniques to detect DNA (such as PCR, FISH, (next generation) sequencing), RNA (such as(q) RT-PCR, expression array, RNAseq, in situ hybridization) and proteins (such as SDS-PAGE, Western blot, immunocytochemistry,	See assessment form 'Poster Presentation' on #OnderwijsOnline – General Information and in the Reader Drug Discovery and Development

on location) ***Assessment:*** Insufficient/Sufficient ***Cut-off value:*** 55% ***Minimal result:*** Sufficient ***Weighting:*** - ***Period and resit:*** YEAR:2 (April 2025, June 2025) ***Compensation:*** none ***Enrolment:***	different sources in the context of the own project 2.3. Defines the project aim in terms of products and/or results based on the acquired background information 3.1. Designs experiments based on the required quality and quantity of the product or result. 4.2. Presents project plans and results in English to colleagues, other researchers in the field or to clients. The poster presentation is at a level equivalent to a presentation at an international symposium 6.5. Gives advice about choosing new equipment or methods based on project goals, overall goals and available resources	immunohistochemistry, protein array, mass spec) and to detect the interaction between biomolecules (e.g. immune-precipitation, chromatin-immunoprecipitation) and can apply the appropriate technique to answer a question about the presence, quantity, alteration/modification, localization or interaction of DNA, RNA or protein • has knowledge and understanding of prokaryotic and eukaryotic cells, function of organelles, cell cycle regulation, DNA repair, signal transduction, protein modification and localization • understands the principle of techniques to analyse cell proliferation, cell cycle, apoptosis, protein modification and can apply these techniques to answer questions on such cellular functions • has knowledge and understanding of the molecular mechanisms that contribute to cancer development and can apply this knowledge for the design of cancer diagnostics and anti-cancer drugs • understands the principles of pharmacology, pharmacokinetics & drug-biotransformation, and pharmacodynamics • knows and understands drug design principles • knows and understands the principle of different types of drugs and treatment approaches (such as small molecules, antibodies, gene therapy, chemotherapy, radiotherapy,	

		immunotherapy), their advantages and disadvantages • is able to choose one type of drug as an active pharmaceutical ingredient depending on the desired biological effect • is able to choose a delivery system based on desired selectivity and bio-availability. • is able to design a strategy to measure the bio-availability of the drug. • can explain methods to analyse biomolecules (such as NMR, chromatography, enzyme assays, ultrafiltration, absorption measurement, selective breakdown, enzyme immune-assay) and is able to choose an analytical method based on the biomolecule(s) to be analysed • is able to design appropriate *in vitro* and *in vivo* assays to test the efficacy, selectivity and toxicology of a drug • knows which animal models can be used to test drugs, and the advantages and disadvantages of these models • understands the meaning of: statistical hypotheses, type of variable (continuous / categorical), association versus causation, confounding variables, variation, normal distribution, population versus sample, dependent and independent observations, Type I and Type II error, descriptive statistics, the relationship between central tendency (mean, median) and	

		variance, p-value and statistical significance, log-transformation, one- or two-sided tests, multiple testing problems and its solutions • Is able to choose the appropriate statistical method for data Analysis, including t-test, ANOVA, multiple regression, chi-square tests • is able to report the results with tables and graphics	
Code Modular exam: TOETS-04	***Competence indicators***	***Knowledge indicators***	***For this assignment, these indicators and knowledge criteria are translated into the following assessment criteria***
Name modular exam: **High-throughput data analysis** ***Type:*** PROD-O (Online/digital (professional) product) ***Assessment:*** Grade ***Cut-off value:*** 55% ***Minimal result:*** 5.5 ***Weighting:*** 35% ***Period and resit:*** YEAR:2 (January 2025, March 2025) ***Compensation:*** none	1.1. Is able to independently acquire knowledge in a new subject by consulting specific literature and other resources; is able to identify reliable and suitable sources; Discriminates between major and side issues 1.2. Combines information from different sources in the context of the own project 1.5 Designs different approaches that could lead to the project aim. Evaluates these possibilities and justifies the choice based on scientific arguments and practical parameters such as time, costs, quality and personnel 3.2. Applies strict logical thinking to draw conclusions from the results and interprets them: - in the context of the experiments - in the context of the project aim (helicopter view)	• understands the principle and application of statistical hypothesis, hypothesis test, one- or two-tailed test, p-value, adjustment for multiple testing Data Mining • is familiar with the most prominent biological databases and their general structure (e.g. NCBI, KEGG.). • is able to formulate a biological question in terms of data and a data integration workflow. High-throughput data analysis • understands the principle steps in analysing high-throughput data obtained by –omics approaches. • has analysed and interpreted a limited number of high-throughput data and is able to communicate to specialists about such analyses	See assessment form 'High-Throughput Data Analysis' on #OnderwijsOnline – General Information and in the Reader Drug Discovery and Development

	- in comparison to other analyses, reference/theoretical values, and quality requirements. 4.1. (intermediate level) Reports project plans and results according to the standard format of scientific documents, and the reader recognizes the scientific international conventions criteria		

HAN_UNIVERSITY OF APPLIED SCIENCES

Production of Biomolecules 1

Title of UOS	***Production of Biomolecules 1*** ***PROOFB14 (PT) / PROOFB08 (FT)***
Degree Programme	Master in Molecular Life Sciences
Target group	Students enrolled in Master in Molecular Life Sciences programme
Title of UOS	Production of Biomolecules 1
Code OSIRIS	PROOFB14 (PT) / PROOFB08 (FT)
Registering for educational components	See Part 3 'OSIRIS Regulations for Education, Exams and Modular Exams' for more information.
Professional task	1. to understand practical, economic, social and/or ecological needs of businesses, market and society that can be anticipated by biotechnology 2. to apply fundamental knowledge in the area of molecular life sciences to find sustainable solutions for these needs
(Professional) Products	• Presentation on gene discovery strategy to optimize biomolecule production in microorganisms
Credits	5 EC
Relationship with and entry requirements concerning exams	• All assessments of this unit of study have to be sufficient.
General description	Central to this unit of study is the development of a strategy to increase the production of specific biomolecules by microorganisms. To this end, data science skills will be applied by students to annotate genes and to identify gene products in microorganisms, which might be involved in biomolecule production. Based on this, students suggest a metabolic engineering strategy to manipulate the cells in such a way that production of specific biomolecules can be increased. Growing cells on biobased materials is considered in the strategy as well.
Competences	**Competence 2: Designing strategies for applied research and product development** **Competence 3: Design, analysis and control of experiments** Competence 4: Communication Competence 5: Managing projects Competence 6: Advising
Assessment criteria	***See exams of the UOS Production of Biomolecules 1 below this table***
Exams	***See exams of the Production of Biomolecules below this table***
Compulsory literature	❖ Students will get access to the HAN BioCentre literature database as background literature for their assignments, especially assignment 6.1.
Recommended literature	❖ Alberts, Johnson, Lewis, Raff, Roberts, and Walter, (2015 or 2017). *Molecular Biology of the Cell*. (6th or 7th edition). Garland Science. ❖ Reed, Weyers & Jones (2016): *Practical Skills in Biomolecular Science.* Pearson ❖ Samuel, M.L., Witmer, J.A., & Schaffner, A. (2011 or 2015). *Statistics for the Life Sciences.* (4th or 5th edition). Pearson.

	❖ Pevsner, J. (2015) Bio-informatics and Functional Genomics Wiley Blackwell. ❖ Original research articles related to the assignments Further literature can be found in the PubMed database and journals on biotechnology/ microbiology, respectively, and might be provided with the specific assignments. To access full-text articles, students can make use of the online facilities of the HAN. ***The reading lists are updated regularly. Therefore, the actual reading list of this unit of study might deviate from the list presented above.***
Software and other materials	Computer and Internet connection
Activities	During this unit of study, students individually work on their different assignments. The supporting education programme will help students to work out their assignments and to master the exam, and therefore to achieve their learning goals. Lectures - Introduction Unit of Study - Introduction biotechnology - Microbial oil production in yeast - Metabolic engineering Workshop/Trainings - Data Science: study databases for genes and metabolic pathways/ verify gene annotation -
Work formats	(Guest) lecture, tutorial
Lesson/ Contact hours	24 contact hours
Compulsory participation	-
Education period	P4N (May-June 2025)
Maximum number of participants	-

Exams of the UOS Production of Biomolecules 1

	Competence indicators	***Knowledge indicators***	***For this assignment, these indicators and knowledge criteria are translated into the following assessment criteria***
Code modular exam: ***TOETS-01***			
Name modular exam: **Presentation on research strategy to optimize biomolecule production in microorganisms**	2.1 Is able to independently acquire knowledge in a new subject by consulting specific literature and other resources; is able to identify reliable and suitable sources; discriminates between major and side issues; 2.2. Combines information from different sources in the context of the own project → In this gene discovery strategy, the student demonstrates that he/she acquired knowledge about yeast morphology and metabolism, metabolic pathways that contribute to specific biomolecule production, about annotating genes and gene function, and combines this knowledge to describe a strategy to enhance biomolecule production from yeast. 2.3 Defines the project aim in terms of products and/or results based on the acquired background information 2.5 Designs different approaches that could lead to the project aim. Evaluates these possibilities and justifies the choice based on scientific arguments and practical parameters such as time, costs, quality and personnel	• has knowledge and understanding of metabolic pathways, cell chemistry and biosynthesis and can apply this knowledge to optimize metabolite production (metabolic engineering) • is able to explain the composition and functions of prokaryotic and eukaryotic cells, function of organelles, cell cycle regulation, DNA repair, signal transduction, protein modification and localization • has knowledge and understanding of the principle of all standard techniques to detect DNA (such as PCR, FISH, (next generation) sequencing), RNA (such as(q) RT-PCR, expression array, RNAseq, in situ hybridization) and proteins (such as SDS-PAGE, Western blot, immunocytochemistry, immunohistochemistry, protein array, mass spec) and to detect the interaction between biomolecules (e.g. immune-precipitation, chromatin-immunoprecipitation) and can apply the appropriate technique to answer a question about the presence, quantity, alteration/modification, localization or interaction of DNA, RNA or protein • is able to design a strategy for gene cloning and heterologous expression • is able to design a (conditional) knock-out strategy (e.g. by Crispr-Cas) • understands how gene expression is regulated in prokaryotes and eukaryotes and	See assessment form 'Presentation on research strategy to optimize biomolecule production in microorganisms' on #OnderwijsOnline – General Information and in the Reader Production of Biomolecules -
Type: PRES-F (Presentation on location)			
Assessment: Grade			
Cut-off value: 55%			
Minimal result: 5.5			
Weighting: 100%			
Period and resit: JAAR:2 (June 2025, July 2025)			
Compensation: none			

	2.6 Designs a complete strategy leading to the project aim (project of about 3-4 months; see also: managing projects) 3.1. Designs experiments based on the required quality and quantity of the product or result 4.2. Presents project plans and results in English to colleagues, other researchers in the field or to clients. The presentation is at a level equivalent to a presentation at an international symposium 6.5 Gives advice about choosing new equipment or methods based on project goals, overall goals and available resources	applies this knowledge to heterologous gene expression Data Mining • is familiar with the most prominent biological databases and their structures (e.g. NCBI, KEGG) • is able to formulate a biological question in terms of data and a data integration workflow Sequence Function annotation (DNA and protein sequences): ▪ is able to use the principles of transcription, mRNA processing, translation, post-translational modifications and protein structure/domains to evaluate the function annotation of a nucleotide and/or protein Is able to perform BLAST-searches and evaluate the results Sequence alignments and score matrices • knows the features of a qualitatively good alignment • is able to illustrate the use of (multiple) sequence alignments • is able to evaluate the evolution of sequences	

HAN_UNIVERSITY OF APPLIED SCIENCES

Production of Biomolecules 2

Title of UOS	***Production of Biomolecules 2*** ***PROOFB31 (PT) / PROOFB28 (FT)***
Degree Programme	Master in Molecular Life Sciences
Target group	Students enrolled in Master in Molecular Life Sciences programme
Title of UOS	Production of Biomolecules 2
Code OSIRIS	PROOFB31 (PT) / PROOFB28 (FT)
Registering for educational components	See Part 3 'OSIRIS Regulations for Education, Exams and Modular Exams' for more information.
Professional task	1. to understand practical, economic, social and/or ecological needs of businesses, market and society that can be anticipated by biotechnology 2. to apply fundamental knowledge in the area of molecular life sciences to find sustainable solutions for these needs
(Professional) Products	• Preparing a technical document on the production of a heterologous protein
Credits/ study load	4 EC
Relationship with and entry requirements concerning exams	• All assessments of this unit of study have to be sufficient.
General description	In the unit of study Production of Biomolecules 2, students will continue their studies of part 1 by setting up a technical document for the heterologous production of a protein. Students apply their knowledge of various production strains, upstream processing, downstream processing and cost calculations. Furthermore, students will become familiar with product development for pharmaceutical purposes and the principles behind Quality by Design. The guidelines of working according to Good Manufacturing Practice (GMP) standards and the consequences thereof are also subject of this unit of study.
Competences	**Competence 2: Designing strategies for applied research and product development** **Competence 3: Design, analysis and control of experiments** Competence 4: Communication Competence 5: Managing projects Competence 6: Advising
Assessment criteria	***See exams of the UOS Production of Biomolecules below***
Exams	***See exams of the Production of Biomolecules below this table***
Compulsory literature	❖ Quality by Design: - Bioproduction Group (2012). Quality by Design in Biomanufacturing. White paper. Available from: www.bio-g.com/ - FDA (2011). Guidance for industry: process validation, general principles and practices. ❖ GMP: - ICH (2000). Good Manufacturing Practice Guide for Active Pharmaceutical Ingredients Q7. - Allport-Settle, M.J. (2009). Good Manufacturing Practice (GMP) Guidelines: The Rules Governing Medicinal Products in the European

	Union, EudraLex Volume 4 Concise Reference. Available from: http://ec.europa.eu/health/documents/eudralex/vol-4/index_en.htm Students will get access to the HAN BioCentre literature database as background literature for their assignments, especially assignment 6.1.
Recommended literature	❖ Alberts, Johnson, Lewis, Raff, Roberts, and Walter, (2015 or 2017). *Molecular Biology of the Cell*. (6th or 7th Edition). Garland Science: ❖ Reed, Weyers & Jones (2016): *Practical Skills in Biomolecular Science.* Pearson ❖ Samuel, M.L., Witmer, J.A., & Schaffner, A. (2011 or 2015). *Statistics for the Life Sciences.* (4th or 5th edition). Pearson. ❖ Pevsner, J. (2015) Bio-informatics and Functional Genomics Wiley Blackwell ❖ Original research articles related to the assignments Further literature can be found in the PubMed database and journals on biotechnology/ microbiology, respectively, and might be provided with the specific assignments. To access full-text articles, students can make use of the online facilities of the HAN. ***The reading lists are updated regularly. Therefore, the actual reading list of this unit of study might deviate from the list presented above.***
Software and other materials	Computer and Internet connection
Activities	During this unit of study, students individually work on their different assignments. The supporting education programme will help students to work out their assignments and to master the exam, and therefore to achieve their learning goals. Lectures - Introduction Unit of Study - Microbial oil production in yeast - Metabolic engineering - Biologicals for pharmaceutical use: Quality by Design Workshop/Trainings - Data Science: study databases for genes and metabolic pathways/ verify gene annotation - Good Manufacturing Practice (GMP)
Work formats	(Guest) lecture, tutorial
Lesson/ Contact hours	18 contact hours
Compulsory participation	-
Education period	P1N (August- September 2024)
Maximum number of participants	-

Exam of the UOS Production of Biomolecules 2

	Assessment criteria/ Indicators / requirements		
Code modular exam: TOETS-01	***Competence indicators***	***Knowledge indicators***	***For this assignment, these indicators and knowledge criteria are translated into the following assessment criteria***
Name modular exam: Technical document on protein production			
Type: PROD-O (Online/digital (professional) product)	2.1 Is able to independently acquire knowledge in a new subject by consulting specific literature and other resources; is able to identify reliable and suitable sources; Discriminates between major and side issues 2.2 Combines information from different sources in the context of the own project 2.3 Defines the project aim in terms of products and/or results based on the acquired background information 2.5. Designs different approaches that could lead to the project aim. Evaluates these possibilities and justifies the choice based on scientific arguments and practical parameters such as time, costs,	• understands the mechanisms of regulation of gene expression in pro- and eukaryotic cells and applies this knowledge for heterologous gene expression • is able to design a strategy for gene cloning and heterologous expression • has knowledge and understanding of biomolecule purification methods (such as size exclusion chromatography, ion exchange, hydrophobic interaction, ultrafiltration, affinity chromatography, precipitation, filtration, drying) and is able to choose a purification method depending on the composition of the original sample and the biomolecule to be purified	See assessment form 'Technical document on protein production' on #OnderwijsOnline – General Information and in the Reader Production of Biomolecules
Assessment: Mark			
Minimal result: 5.5			
Weighting: 100%			
Period and resit: YEAR: 2 (September 2024, November 2024)			

	quality and personnel 2.6. Designs a complete strategy leading to the project aim (project of about 3-4 months; see also: managing projects) 3.1. Designs experiments based on the required quality and quantity of the product or result. 4.1. (intermediate level): Reports project plans and results according to the standard format used in the company/field and the reader recognizes the scientific international conventions criteria. 5.1. Defines project deliverables based on the needed quality and quantity 5.2. Identifies project risks based on the (experimental) approach and on (putative) competitors 5.3. Defines project exclusions 5.4. Organizes the project in phases and defines decision	• has knowledge and understanding of methods to analyse biomolecules (such as NMR, chromatography, enzyme assays, ultrafiltration, absorption measurement, selective breakdown, enzyme immune-assay) and is able to choose an analytical method based on the biomolecule(s) to be analysed • is able to identify critical parameters in the process Enzymes: • knows the industrial applications of enzymes Process development and optimization: • knows the advantages and disadvantages of different production strains and is able to choose a suitable production strain for the production of specific	

	points/milestones 5.5. Describes the project organisation including the responsibilities of all project members 5.6. Writes a communication plan concerning all project members and parties involved 5.7. Describes a times schedule based on the (experimental) plan 5.8. Describes the required budget	proteins • tests critical parameters in the production process (USP and DSP) and interprets the outcome • is able identify critical parameters in the process • is aware of the fact that scaling up or down requires process re-optimization Biobased Economy: • is able to describe a target product profile and criteria I quality attributes • Is able to explain the main principles of a biobased economy and its new technological challenges • is able to explain the difference between first, second and third generation feedstocks • is able to describe the steps needed to convert plant biomass into fermentation feedstock • is able to describe the technological challenges by using biomass as fermentation feedstocks	

HAN_UNIVERSITY OF APPLIED SCIENCES

Vaccines and Diagnostics

Title of UOS	***Vaccines and Diagnostics*** ***VACCDI10 (PT) / VACCDI05 (FT)***
Degree Programme	Master in Molecular Life Sciences
Target group	Students enrolled in Master in Molecular Life Sciences programme
Title of UOS	Vaccines and Diagnostics
Code OSIRIS	VACCDI10 (PT) / VACCDI05 (FT)
Registering for educational components	See Part 3 'OSIRIS Regulations for Education, Exams and Modular Exams' for more information.
Professional task	1. to understand practical, economic, social and/or ecological needs of businesses, market and society that can be anticipated by biotechnology 2. to apply fundamental knowledge in the area of molecular life sciences to find sustainable solutions for these needs 3. to implement such solutions in a successful and efficient way by organizing their realization in projects, considering the interdisciplinary dimension and communicating with different experts. Such projects have a duration of at least three months.
(Professional) Products	• Proposal for development of a putative new/improved vaccine • Business plan for development and validation of a diagnostic test
Credits, study load	9 EC
Relationship with and entry requirements concerning exams	• All assignments of this module have to be sufficient
General description	During this unit of study, students acquire knowledge and skills in the area of vaccine discovery and production, as well as development and validation of a diagnostic test. Moreover, the student will learn to broaden his/her perspective by making a business plan for the development of the diagnostic test of choice. By writing a proposal on the development of a putative new or improved vaccine, they deepen their knowledge of infectious diseases, immunological processes and the interaction between pathogens and hosts. They also focus on the production and efficacy testing of a vaccine in the R&D phase of vaccine development. Students train their professional writing skills, learning how to write a proposal that is convincing for the scientific community. Students will also choose a diagnostic test and acquire knowledge and understanding of different types of diagnostic tests and their advantages and limitations in detecting specific pathogens. Based on this choice, students write a business plan for the development and validation of this diagnostic test, detailing e.g. the business opportunity (model), the unmet need, market situation, organisation and finances, and other relevant requirements and goals. Students train their professional writing skills, learning how to write a business plan that is convincing for managerial audiences. The competence development of students is focussed on 'Designing strategies for applied research and product development', 'Design, analysis and control of experiments', 'Communication' and 'Advising'.
Competences	**Competence 2: Designing strategies for applied research and product development** **Competence 3: Design, analysis and control of experiments** **Competence 4: Communication**

	Competence 5: Managing projects **Competence 6: Advising**
Assessment criteria	***See exams of Vaccines and Diagnostics below this table***
Exams	***See exams of Vaccines and Diagnostics below this table***
Compulsory literature	❖ Module Reader Vaccines and Diagnostics ❖ ATBC Scientific Writing (OnderwijsOnline) ❖ Specific assignments Key articles are provided with the specific assignments Further assignment-specific literature can be found in the PubMed database
Recommended literature	Books: ❖ For immunological background: any good immunology study book, such as: ○ Murphy, K. (2016). *Janeway's Immunobiology* (9th edition). Garland Science ○ Belves, P.J., Martin, S.J., Burton, D.R., Roitt, I.M. (2010, 2012 or 2017). *Roitt's Essential Immunology.* (11th , 12th or 13th Edition). Wiley-Blackwell ○ Male, D., Brostoff, J., Roth, D.B. & Roitt, I.M. (2012). *Immunology* (8th edition). Philadelphia: Elsevier ○ Parts of: Alberts, Johnson, Lewis, Raff, Roberts, and Walter (2011 or 2015). *Molecular Biology of the Cell.* (6th or 7th Edition). Garland Science. ○ Wood, P. (2011). *Understanding Immunology.* (3rd edition). Person Education Limited (advice from previous student to start with in cases of very little background knowledge) => focus on the chapters about innate and adaptive immunity against pathogens, antigen presentation, activation of B and T cells, vaccination and antibody production ❖ Tang, Y., Stratton, C.W. (2013 or 2018) *Advanced Techniques in Diagnostic Microbiology* (2nd or 3rd edition). Springer, New York ❖ Samuel, M.L., Witmer, J.A., & Schaffner, A. (2011 or 2015). *Statistics for the Life Sciences* (4th or 5th edition). Pearson. ❖ Glasman-Deal, H. (2009). *Science Research Writing for non-native speakers of English.* Imperial College Press ❖ Research articles relevant to the assignments: Further assignment-specific literature can be found in the PubMed database (do not forget to make use of the Journals the HAN has access to). ***The reading lists are updated regularly. Therefore, the actual reading list of the unit of study might deviate from the list presented above.***
Software and other materials	Computer and internet connection
Activities	During this module, students will individually work on their central assignments which are advising on the improvement of a vaccine and

	writing a business plan on the development of a diagnostic test (see also assessment). The supporting education programme will help students to work out their assignments and to master the exam, and therefore to achieve their learning goals. <u>Lectures and workshops:</u> - (Guest)Lectures on immunology, infectious diseases and vaccine development - Lecture on plagiarism and scientific integrity - A question hour about the vaccine proposal - A World Cafe discussing your vaccine development proposal with peers - Peer feedback on the draft of your vaccine proposal - Interactive lectures on diagnostic tests and their advantages and disadvantages - Lectures on business development and writing a business plan - Workshops on the why, what and how of the business plans - Workshop 'writing for non-scientists' - Lecture on patent searches & summarizing patent claims (given by an expert from the Dutch Patent Office, in part on demand webinar) - Lecture on the statistics of diagnostics tests
Work formats	(Guest) lecture, tutorial
Lesson/ Contact hours	60 contact hours
Compulsory participation	Assessments
Education period	P1N (October 2024 – February 2025)
Maximum number of participants	-

Exam of the UOS Vaccines and Diagnostics

	Assessment criteria/ Indicators / requirements		
	Competence indicators	***Body of Knowledge and Skills***	***Assessment criteria***
Code modular exam: **TOETS-01** ***Name modular exam:*** Vaccine development proposal	**Competence indicators**	***Knowledge indicators***	***For this assignment, these indicators and knowledge criteria are translated into the following assessment criteria***
Type: PROD-O (Online/digital (professional) product) ***Assessment:*** Grade ***Cut-off value:*** 55% ***Minimal result:*** 5.5 ***Weighting:*** 100% ***Period and resit:***	2.1. Is able to independently acquire knowledge in a new subject by consulting specific literature and other resources; is able to identify reliable and suitable sources; Discriminates between major and side issues; 2.2. Combines information from different sources in the context of the own project 2.3. Defines the project aim in terms of products and/or results based on the acquired background information 2.5. Designs different approaches that could lead to the project aim. Evaluates these possibilities and justifies the choice based on scientific arguments and practical parameters such as time, costs, quality and personnel 2.6 Designs a complete strategy leading to the project aim (project of about 3-4 months; see also: managing projects) 3.1 Designs experiments based on	• has knowledge and understanding of prokaryotic and eukaryotic cells, function of organelles, cell cycle regulation, DNA repair, signal transduction, protein modification and localization • understand the mechanisms by which micro-organisms can cause disease • has knowledge and understanding of the immune response to pathogens (action of innate and adaptive immune system, induction and effects of cellular and humoral immunity, mechanisms for induction of memory) • knows different types of vaccines (such as attenuated, inactivated, subunit, recombinant, DNA), their mode of action and their advantages and disadvantages • is able to choose a vaccine antigen, adjuvant and administration route depending on the immune response that is required and on practical aspect • knows different vaccine production platforms, their advantages and disadvantages	See assessment form 'Vaccine development proposal' on #OnderwijsOnline – General Information and in the Reader Vaccines and Diagnostics

YEAR 2 (December 2024, February 2025) ***Compensation:*** none	the required quality and quantity of the product or result. 3.2 Applies strict logical thinking to draw conclusions from the results and interprets them: - in the context of the experiments - in the context of the project aim (helicopter view) - in comparison to other analyses, reference/theoretical values, and quality requirements 4.1. Reports project plans and results according to the standard format of scientific documents and meets the scientific international conventions criteria. 5.7 Describes a schedule based on the (experimental) plan 6.5. Gives advice about choosing new equipment or methods based on project goals, overall goals and available resources	• is able to design experiments to test the potency of a vaccine	
Code modular exam: **TOETS-02**	***Competence indicators***	***Knowledge indicators***	***For this assignment, these indicators and knowledge criteria are translated into the following assessment criteria***
Name modular exam: Business plan ***Type: PROD-O (Online/digital (professional) product)*** ***Assessment:***	2.1. Is able to independently acquire knowledge in a new subject by consulting specific literature and other resources; is able to identify reliable and suitable sources; Discriminates between major and side issues 2.2. Combines information from different	• has knowledge and understanding of the principle of all standard techniques to detect DNA (such as PCR, FISH, (next generation) sequencing), RNA (such as(q) RT-PCR, expression array, RNAseq, in situ hybridization) and proteins (such as SDS-PAGE, Western blot,	See assessment form 'Business plan' on #OnderwijsOnline – General Information and in the Reader Workplace Learning

sufficient/ insufficient ***Cut-off value:*** - ***Minimal result:*** sufficient ***Weighting:*** 0% ***Period and resit:***YEAR:2 (January 2025, March 2025) ***Compensation:*** None	sources in the context of the own project 2.3. Defines the project aim in terms of products and/or results based on the acquired background information 2.4 Defines the quality requirements for products and processes based on legal requirements. 2.5 Designs different approaches that could lead to the project aim. Evaluates these possibilities and justifies the choice based on scientific arguments and practical parameters such as time, costs, quality and personnel 2.6 Designs a complete strategy leading to the project aim (project of about 3-4 months; see also: managing projects) 2.7 Identifies opportunities to patent products, results and strategies 3.1 Designs experiments based on the required quality and quantity of the product or result. 4.3 Describes the key message of the project relevant for patenting, registration, and/or business development. Uses terminology that is understandable for experts from different departments 5.1 Defines project deliverables based on the needed quality and quantity 5.2 Identifies project risks based on the (experimental) approach and on (putative) competitors 5.4. Organizes the project in phases and defines decision points/ milestones 5.7 Describes a schedule based on the	immunocytochemistry, immunohistochemistry, protein array, mass spec) and to detect the interaction between biomolecules (e.g. immune-precipitation, chromatin-immunoprecipitation) and can apply the appropriate technique to answer a question about the presence, quantity, alteration/modification, localization or interaction of DNA, RNA or protein • has knowledge and understanding of methods to analyse biomolecules (such as NMR, chromatography, enzyme assays, ultrafiltration, absorption measurement, selective breakdown, enzyme immune-assay) and is able to choose an analytical method based on the biomolecule(s) to be analysed • understands the meaning of the terms business models and business development, business value and financing • is able to translate his/her projects plans in a concise business plan • knows different types of diagnostic tests, their principle of action and their advantages and disadvantages • understands the principles, advantages and disadvantages of different diagnostic tests, e.g. serology and molecular diagnostics	

	(experimental) plan 5.8 Describes the required budget 6.4 Integrates own project results in the multidisciplinary defined goals and advises other departments	• is able to define the importance of sensitivity, specificity, and practical aspects such as costs, duration or required trained staff, based on the desired application of the diagnostic test • is able to choose a type of diagnostic test based on the required specificity, sensitivity and practical aspects such as duration, requirement for staff training • is able to design a strategy to develop and validate a diagnostic test • is able to define quality requirement for products and processes based on regulatory guidelines • understands what determination of sensitivity, specificity and precision of a diagnostic test implies, including its statistics and ROC curves • is able to describe a target product profile and critical quality attributes • is able to use patent databases to identify patent blocks • is aware that he/she needs to contact patent experts if he/she is not sure how to interpret patent databases • is aware of the rights derived from intellectual properties and understands which implications these have for the production of generics and biosimilars	

Research and Product Development Skills 1

Title of UOS	***Research and Product Development Skills 1 RESPRD22 (PT) / RESPRD11 (FT)***
Degree Programme	Master in Molecular Life Sciences
Target group	Students enrolled in Master in Molecular Life Sciences programme
Title of UOS	Research and Product Development Skills 1
Code OSIRIS	RESPRD22 (PT) / RESPRD11 (FT)
Registering for educational components	See Part 3 'OSIRIS Regulations for Education, Exams and Modular Exams' for more information.
Professional task	1. to understand practical, economic, social and/or ecological needs of businesses, market and society that can be anticipated by biotechnology 2. to apply fundamental knowledge in the area of molecular life sciences to find sustainable solutions for these needs
(Professional) Products	• Scientific document • R&D Presentation • Research performance 1 • Design of Experiments • Scientific report
Credits/ study load	23 EC
Relationship with and entry requirements concerning exams	All assessments of this unit of study have to be sufficient.
General description	This unit of study focuses on the skills necessary for research and product development in various stages of product development pipelines in bioscience. Students become aware of the different stages of the product development pipelines in bio business and will develop the necessary Research and Product Development skills required to run projects within this pipeline. Research skills trained in this unit of study comprise finding and interpreting relevant literature, experimental excellence, data analysis and interpretation, and Design of Experiments. In addition, students are trained in scientific writing, presenting and discussions, and advising about the own or similar projects in an interdisciplinary context. Students perform this unit of study in the context of their (placement) workplace. The product, a Scientific report, and the Design of Experiments are preferentially produced by students using their very own professional environment. Students with work experience prior to the study programme can demonstrate that the already acquired the intermediate competence level by handing in a portfolio at the start of the unit of study. After demonstration of this intermediate level, they are exempted from the respective study activities. This competences Designing strategies for applied research and product development, Design, analysis and control of experiments and Communication are the focus in this unit of study. These competences are integrally applied with competences in Managing Projects, which are trained during the unit of study Managing Projects 1 that runs in parallel to this unit of study.

Competences	**Competence 2: Designing strategies for applied research and product development** **Competence 3: Design, analysis and control of experiments** **Competence 4: Communication** Competence 5: Managing projects **Competence 6: Advising**
Assessment criteria	***See exams of the UOS R&D Skills below this table***
Exams	❖
Compulsory literature	❖ Reader Research and Product Development Skills ❖ Scientific literature related to the (placement) workplace projects and provided during the unit of study ❖ Quality Guidelines of the ICH ❖ Scientific writing guide (provided on Onderwijs Online)
Recommended literature	❖ Glasman-Deal; H. (2009). *Science Research Writing for Non-Native Speakers of English.* Imperial College Press ❖ Stevens, M. (2007). *Subtleties of Scientific Style.* Sciencescape Editing, Australia ***The reading lists are updated regularly. Therefore, the actual reading list of the unit of study might deviate from the list presented above.***
Software and other materials	Computer and Internet connection SPSS Statistics
Activities	During this unit of study, students individually learn on their (internship) workplace by contributing to project work and working on their different assignments. The supporting education programme will help students to work out their assignments and to develop to the required level in practice, and therefore to achieve their learning goals. <u>Lectures</u> - Introduction into the product development pipelines <u>Workshop/Trainings</u> - Research skills and Project Development Skills (e.g. Journal clubs, analysing scientific literature, market surveys) - Design of Experiment (DoE as part of Statistics) - Scientific writing - Presenting skills - Peer feedback sessions and question hours
Work formats	Internship/workplace/workplace learning, lecture, tutorial
Lesson/ Contact hours	55 contact hours at HAN and 589 contact hours learning on the (placement) workplace of which 280 hours related to professional products and 309 hours related to professional performance development
Compulsory participation	The participation in the placement according to the placement contract is compulsory for students enrolled in the full-time programme.
Education period	P1N (September 2023 – August 2024)
Maximum number of participants	The maximum number of participants is defined by the number of (placements) workplaces for the full-time programme. The number of participants taking part in this unit of study as part-time or modular student is unlimited.

Exam of the UOS Research and Product Development Skills 1

<table>
<tr><td></td><td colspan="3">Assessment criteria/ Indicators / requirements</td></tr>
<tr><td></td><td>Competence indicators</td><td>Body of Knowledge and Skills</td><td>Assessment criteria</td></tr>
<tr><td>Code modular exam:
TOETS-01</td><td rowspan="2">Competence indicators</td><td rowspan="2">Knowledge indicators</td><td rowspan="2">Assessment criteria</td></tr>
<tr><td>Name modular exam:
Scientific document</td></tr>
<tr><td>Type:
PROD-O (Online/digital (professional) product)</td><td rowspan="10">4.1. (intermediate level):
Reports project plans and results according to the standard format of scientific documents and the reader recognises the scientific international conventions criteria.</td><td rowspan="10">Depending on context of (internship) workplace</td><td rowspan="10">See assessment form ‘Scientific Document’ on #OnderwijsOnline – General Information and in the Reader Workplace Learning</td></tr>
<tr><td></td></tr>
<tr><td>Assessment:
Sufficient/ insufficient</td></tr>
<tr><td>Cut-off value:
-</td></tr>
<tr><td>Minimal result:
sufficient</td></tr>
<tr><td>Weighting:
0%</td></tr>
<tr><td>Period and resit:
Full-time: YEAR 2 (November 2024, January 2025);
Part-time: YEAR 2</td></tr>
<tr><td>Compensation:
None</td></tr>
<tr><td></td></tr>
<tr><td>Code modular exam:
TOETS-02</td><td>Competence indicators</td><td>Knowledge indicators</td><td>For this assignment, these indicators and knowledge criteria</td></tr>
</table>

Name modular exam: R&D Presentation			***are translated into the following assessment criteria***
Type: PRES-F (Presentation on location) ***Assessment:*** Sufficient / insufficient ***Cut-off value:*** - ***Minimal result:*** sufficient ***Weighting:*** 0% ***Period and resit:*** Full-time: YEAR 2 (January 2025, February 2025) Part-time: YEAR 2 ***Compensation:*** None	4.2. (intermediate level): Presents experimental data and results in English to colleagues.	*Depending on context of (internship) workplace*	See assessment form 'R&D Presentation' on #OnderwijsOnline – General Information and in the Reader Workplace Learning
Code modular exam: **TOETS-03** ***Name modular exam:*** **Research performance 1**	***Competence indicators***	***Knowledge indicators***	***Assessment criteria***
Type: PERF-O (Online/digital performance)	Intermediate Level (insufficient/ sufficient) 2.1 (intermediate level): Is able to independently acquire	*Depending on context of (internship) workplace*	See assessment form 'Research Performance 1' on #OnderwijsOnline – General Information and in the Reader

	knowledge in a new subject by consulting specific literature 2.2 (intermediate level): Combines information from different sources in the context of the own experiment 2.3 (intermediate level): Designs different approaches that could lead to the experimental results. Evaluates these possibilities and justifies the choice based on arguments and practical parameters. 3.1. (intermediate level): Designs experiments based on a requested intermediate product. 3.2 (intermediate level): Applies strict logical thinking to draw conclusions from the results: - in the context of the experiments - in comparison to other analyses, reference/theoretical values, and quality requirements. 3.3. (intermediate level): Solves practical problems if experiments do not work as planned (trouble shooting); consults colleagues if necessary. 5.1 (intermediate level): Describes a schedule for a set of necessary experiments. 5.2 (intermediate level): Works efficiently towards a set of defined deliverables. 5.3 (intermediate level): Is in control of the experiments. 5.4 (intermediate level): Is flexible with changing circumstances by adapting the experimental strategy 6.1 (intermediate level):		Workplace Learning
Assessment: Sufficient/insufficient			
Cut-off value: All criteria sufficient			
Minimal result: sufficient			
Weighting: 0%			
Period and resit: Full-time: YEAR:2 (June 2025; August 2025) Part-time: YEAR 2			
Compensation: None			

	Actively participates in a discussion about related projects by asking critical questions. 6.2 (intermediate level): Advises about follow-up projects of the own experiments. 6.3 (intermediate level): Gives advice about choosing new equipment.		
Code modular exam: **TOETS-04** ***Name modular exam:*** Design of experiments	***Competence indicators***	***Knowledge indicators***	***For this assignment, these indicators and knowledge criteria are translated into the following assessment criteria***
Type: PROD-O (Online/digital (professional) product) ***Assessment:*** sufficient/insufficient ***Cut-off value:*** sufficient ***Minimal result:*** sufficient ***Weighting:*** 0% ***Period and resit:*** Full-time: YEAR:2 (February 2025, April 2025) Part-time: YEAR 2 ***Compensation:*** none	3.1. Designs experiments based on the required quality and quantity of the product or result. 3.2. Applies strict logical thinking to draw conclusions from the results and interprets them: - in view of the experiments - in view of the project aim (helicopter view) - in comparison to other analyses, reference/theoretical values, and quality requirements. 5.1 Defines project deliverables based on the needed quality and quantity 5.2 Identifies project risks based on the (experimental) approach and on (putative) competitors	• understands the basics of design of experiments (DoE) methodology, including: design of experiments, randomization, blocking by nuisance factor, factorial design, screening design, comparative designs, optimization design, one-factor at a time • is able to design and analyse a screening and / or process optimization experiment using experimental design • is able to report the results with tables and graphics	See assessment form 'Design of Experiments' on #OnderwijsOnline – General Information and in the Reader Workplace Learning

Code modular exam: **TOETS-05**			
Name modular exam: **Scientific Report** ***Type:*** PROD-O (Online/digital (professional) product) ***Assessment:*** Grade ***Cut-off value:*** 55% ***Minimal result:*** 5.5 ***Weighting:*** 100% ***Period and resit:*** YEAR:2 ***Compensation:*** None	3.2 Applies strict logical thinking to draw conclusions from the results and interprets them: - in the context of the experiments - in the context of the project aim (helicopter view) - in comparison to other analyses, reference/theoretical values, and quality requirements. 3.3 Solves practical problems if experiments do not work as planned (trouble shooting); couples back to the theory or consults colleagues if necessary; suggests alternative experiments. 4.1. (intermediate level): Reports project plans and results according to the standard format of scientific documents and the reader recognizes the scientific international conventions criteria.	*Depending on context of (internship) workplace*	See assessment form 'Scientific Report' on #OnderwijsOnline – General Information and in the Reader Workplace Learning

HAN_UNIVERSITY OF APPLIED SCIENCES

Research and Product Development Skills 2

Title of UOS	***Research and Product Development Skills 2 RESPRD18 (PT) / RESPRD10 (FT)***
Degree Programme	Master in Molecular Life Sciences
Target group	Students enrolled in Master in Molecular Life Sciences programme
Title of UOS	Research and Product Development Skills 2
Code OSIRIS	RESPRD18 (PT) / RESPRD10 (FT)
Registering for educational components	For all education offered after 31 January 2023, students need to register for the educational components they wish to follow. See Part 3 'OSIRIS Regulations for Education, Exams and Modular Exams' for more information.
Professional task	1. to understand practical, economic, social and/or ecological needs of businesses, market and society that can be anticipated by biotechnology 2. to apply fundamental knowledge in the area of molecular life sciences to find sustainable solutions for these needs
(Professional) Products	• Quality guidelines assignment • Research performance 2
Credits/ study load	10 EC
Relationship with and entry requirements concerning exams	• Successful completion of the modular exams of the modular exams "Research Performance 1" of the unit of study Research and Product Development Skills 1 is entry requirement for the assessment of "Research Performance 2" of this unit of study • All assessments of this unit of study have to be sufficient.
General description	This unit of study is a follow-up of the unit of study Research and Product Development Skills 1. It again focuses on the skills necessary for research and product development in various stages of product development pipelines in bioscience. Research skills trained in this unit of study comprise finding and interpreting relevant literature, experimental excellence, data analysis and interpretation. Product development skills of this unit of study cover interpreting relevant quality guidelines.. Students perform this unit of study in the context of their (placement) workplace. Their studies on quality guidelines are preferentially related to their own professional environment. These competences Designing strategies for applied research and product development, Design, analysis and control of experiments and communication are the focus in this unit of study. These competences are integrally applied with competences in Managing Projects, which are trained during the unit of study Managing Projects 2 that runs in parallel to this unit of study.
Competences	**Competence 1:** Professional conduct and guiding professional development **Competence 2: Designing strategies for applied research and product development** **Competence 3: Design, analysis and control of experiments** **Competence 4: Communication** Competence 5: Managing projects

	Competence 6: Advising
Assessment criteria	***See exams of the UOS R&D Skills below this table***
Exams	❖
Compulsory literature	❖ Reader Research and Product Development Skills ❖ Scientific literature related to the (placement) workplace projects and provided during the unit of study ❖ Quality Guidelines of the ICH ❖ Scientific writing guide (provided online on # OnderwijsOnline :ATBC Scientific Writing)
Recommended literature	❖ Glasman-Deal; H. (2009). *Science Research Writing for Non-Native Speakers of English.* Imperial College Press ***The reading lists are updated regularly. Therefore, the actual reading list of* the unit of study *might deviate from the list presented above.***
Software and other materials	Computer and Internet connection
Activities	During this unit of study, students individually learn on their (placement) workplace by contributing to project work and working on their different assignments. The supporting education programme will help students to work out their assignments and to develop to the required level in practice, and therefore to achieve their learning goals. <u>Lectures</u> - Overview Quality guidelines <u>Workshop/Trainings</u> - Research skills and Project Development Skills (e.g. Journal clubs, analysing scientific literature) - Scientific writing - Interpreting quality guidelines - Feedback session and question hour -
Work formats	Internship/workplace/workplace learning, lecture, tutorial
Lesson/ Contact hours	280 contact hours: • 25 contact hours at HAN and • 255 contact hours learning on the (placement) workplace of which 130 hours related to professional products and 125 hours related to professional performance development
Compulsory participation	The participation in the placement according to the placement contract is compulsory for students enrolled in the full-time programme.
Education period	P1N, P2N (September 2024 – February 2025)
Maximum number of participants	The maximum number of participants is defined by the number of (placements) workplaces for the full-time programme. The number of participants taking part in this unit of study as part-time or modular student is unlimited.

Exam of the UOS Research and Development Skills 2

	Assessment criteria/ Indicators / requirements		
	Competence indicators	***Knowledge indicators***	***Assessment criteria***
Code modular exam: ***TOETS-01***			
Name modular exam: **Research performance 2**	2.1. Is able to independently acquire knowledge in a new subject by consulting specific literature and other resources; is able to identify reliable and suitable sources; Discriminates between major and side issues 2.2 Combines information from different sources in the context of the own project 2.5. Designs different approaches that could lead to the project aim. Evaluates these possibilities and justifies the choice based on scientific arguments and practical parameters such as time, costs, quality and personnel. 3.1. Designs experiments based on the required quality and quantity of the product or result. 3.2. Applies strict logical thinking to draw conclusions from the results and interprets them: - in the context of the experiments - in the context of the project aim (helicopter view) - in comparison to other analyses, reference/theoretical values, and quality requirements. 3.3. Solves practical problems if experiments do not work as planned (trouble shooting); couples back to the theory or consults colleagues if		See assessment form 'Research Performance 2' on #OnderwijsOnline – General Information and in the Reader Workplace Learning
Type: PERF-O (Online/digital performance)			
Assessment: Grade			
Cut-off value: 55%			
Minimal result: 5.5			
Weighting: 60%			
Period and resit: YEAR:2			
Compensation: none			

	necessary; suggests alternative experiments. 5.11. Sets priorities and works efficiently towards the defined project aim/deliverables 5.12. Is in control of the project during all phases by being proactive if the project does not run according to the plans and initiating an alternative strategy 5.13. Is flexible with changing circumstances by adapting the experimental, project and/or communication strategy 5.14. Obtains the deliverables in time and with the described resources; if not, reasons and justifies the decisions that have been taken in the course of the project 6.1. Actively involves different specialists to collect advice contributing to the progress of the project. 6.2. Actively participates in a discussion about related projects by asking critical questions and suggesting follow-up experiments. 6.3. Advises about follow-up projects of the own project. 6.5. Gives advice about choosing new equipment or methods based on project goals, overall goals and available resources		
Code modular exam: **TOETS-02** ***Name modular exam:*** Assignment on quality guidelines	***Competence indicators***	***Knowledge indicators***	***For this assignment, these indicators and knowledge criteria are translated into the following assessment criteria***
Type: PROD-O (Online/digital	2.4 Defines the quality requirements for		See assessment form 'Assignment on

(professional) product) ***Assessment:*** Grade ***Cut-off value:*** 55% ***Minimal result:*** 5.5 ***Weighting:*** 40% ***Period and resit:*** Full-time: YEAR:2 (October 2024, December 2024) Part-time: YEAR:2 ***Compensation:*** none	products and processes based on legal requirements.	• Is able to define quality requirements for products and processes based on regulatory guidelines • Is able to describe a target product profile and critical quality attributes	quality guidelines' on #OnderwijsOnline – General Information and in the Reader Workplace Learning

Managing Projects 1

Title of UOS	***Managing Projects 1*** ***MANAPR12 (PT) / MANAPR06 (FT)***
Degree Programme	Master in Molecular Life Sciences
Target group	Students enrolled in Master in Molecular Life Sciences programme
Title of UOS	Managing Projects 1
Code OSIRIS	MANAPR12 (PT) / MANAPR06 (FT)
Registering for educational components	See Part 3 'OSIRIS Regulations for Education, Exams and Modular Exams' for more information.
Professional task	1. to understand practical, economic, social and/or ecological needs of businesses, market and society that can be anticipated by biotechnology 2. to implement such solutions in a successful and efficient way by organizing their realization in projects, considering the interdisciplinary dimension and communicating with different experts. Such projects have a duration of at least three months.
Professional Products	• Professional toolbox (intermediate level) including a Network Analysis (intermediate level) • Project proposal
Credits/ study load	15 EC
Relationship with and entry requirements concerning exams	• All assessments of this unit of study have to be sufficient.
General description	The focus of this unit of study is the training of the competencies Professional conduct and Guiding the Professional Development, and Managing Projects. Students perform this unit of study in the context of their own (placement) workplace and are supported in their development by various teaching and assessment activities. In the beginning, the unit of study focusses on collecting a professional toolbox and getting an awareness of challenges when managing projects. A network analysis gives students insights into the network available to them in comparison to the expertise required for their professional tasks and learning goals. Next, students are trained in the project planning including the definition of deliverables and their quality, project stages, milestones, decision points, exclusions, risks and strategies to deal with them, the project organization and communication plan, a time schedule and budget planning. Students acquire knowledge and understanding during the interactive classes, and apply this in practice in their (placement) workplace. The experiences made in practice are discussed during classes. This unit of study is integrally carried out with the unit of study Research and Product Development Skills which runs in parallel to this unit of study.
Competences	**Competence 1: Professional conduct and guiding professional development** Competence 3: Design, analysis and control of experiments Competence 4: Communication **Competence 5: Managing projects**

	Competence 6: Advising
Assessment criteria	***See exams of the UOS Managing Projects 1 below this table***
Exams	***See exams of the UOS Managing Projects 1 below this table***
Compulsory literature	❖ Provided lecture material
Recommended literature	❖ Meyer, E. (2014). The culture map: Decoding how people think, lead and get things done across cultures. "Public Affairs, United States ❖ ***The reading lists are updated regularly. Therefore, the actual reading list of this unit of study might deviate from the list presented above.***
Software and other materials	-
Activities	<u>Collecting the Professional Toolbox:</u> - Workshops, Intervision/ supervision <u>Planning and control of projects</u> - The classes cover organisational, attitude and communication aspects of managing projects. Aim, result, exclusions and presentation techniques - Defining Project phases and Work breakdown - Project Organisation and communication, organizing project meetings - Risk management, Techniques used in project meetings - Presentation of Project Work Plans Individual feedback is given on drafts of the project proposals. Classes are held in an interactive way, making the transfer of theory possible.
Work formats	Internship/workplace/workplace learning, assignments, lectures, tutorial, peer review (intervision)
Lesson/ Contact hours	60 contact hours and 360 hours learning on the (placement) workplace of which 140 hours related to professional products and 220 related to professional development
Compulsory participation	The participation in the placement according to the placement contract is compulsory for students enrolled in the full-time programme.
Education period	P1N (September 2024 – August 2025)
Maximum number of participants	The maximum number of participants is defined by the number of (placements) workplaces for the full-time programme. The number of participants taking part in this unit of study as part-time or modular student is unlimited.

Exam of the UOS Managing Projects 1

	Assessment criteria/ Indicators / requirements		
	Competence indicators	***Body of Knowledge and Skills***	***Assessment criteria***
Code modular exam: TOETS-01	*Competence indicators*	*Knowledge indicators*	*For this assignment, these indicators and knowledge criteria are translated into the following assessment criteria*
Name modular exam: Professional toolbox ***Type:*** PERF-O (Online/digital performance) ***Assessment:*** Sufficient / insufficient ***Cut-off value:*** - ***Minimal result:*** sufficient ***Weighting:*** 0% ***Period and resit:*** YEAR:2 ***Compensation:*** None	1.1. (intermediate level): Shows a professional, pro-active, curious, touching scientific attitude: adapts quickly, motivates him/herself, shows initiative, is goal-oriented, and acts honestly and efficiently 1.2. (intermediate level): Works efficiently in a team (colleagues, project leader, client) during the experimental phase of a project through open communication. 1.3. (intermediate level): uses a professional network within the own organisation 1.5. (intermediate level): Critically reflects on the own role in the experimental phase of a project. 1.6. (intermediate level): Critically reflects on the own personality. 1.7. (intermediate level): Defines personal learning goals (based on project/work requirements). 4.5. (intermediate level): Contributes to the efficiency of meetings by being prepared. 4.6. (intermediate level): Is efficient in keeping the project leader informed on progress of the experiments. 5.9. (intermediate level): Performs	*Depending on context of the (internship) workplace*	See assessment form 'Professional Toolbox' on #OnderwijsOnline – General Information and in the Reader Workplace Learning

	his/her responsibilities.		
	Competence indicators	***Knowledge indicators***	***For this assignment, these indicators and knowledge criteria are translated into the following assessment criteria***
Code modular exam: ***TOETS-02***			
Name modular exam: Project Proposal ***Type:*** PROD-O (Online/digital (professional) product) ***Assessment:*** Grade ***Cut-off value:*** 55% ***Minimal result:*** 5.5 ***Weighting:*** 100% ***Period and resit:*** YEAR:2 (May 2025, July 2025)	2.2. Combines information from different sources in the context of the own project. 2.3. Defines the project aim in terms of products and/or results based on the acquired background information. 2.4. Defines the quality requirements for products and processes based on customer / legal requirements. 2.5 Designs different approaches that could lead to the project aim. Evaluates these possibilities and justifies the choice based on scientific arguments and practical parameters such as time, costs, quality and personnel 2.6. Designs a complete strategy leading to the project aim (project of about 3-4 months; see also:	*Depending on context of the (internship) workplace*	See assessment form 'Project Proposal' on #OnderwijsOnline – General Information and in the Reader Workplace Learning

Compensation: None	managing projects). 3.1 Designs experiments based on the required quality and quantity of the product or result. 4.1. (intermediate level): Reports project plans and results according to the standard format of scientific documents and the reader recognizes the scientific international conventions criteria. 4.2. Presents project plans and results in English to colleagues, other researchers in the field or to clients. The presentation is at a level equivalent to a presentation at an international symposium.		

	5.1. Defines project deliverables based on the needed quality and quantity. 5.2. Identifies project risks based on the (experimental) approach and on (putative) competitors. 5.3. Defines project exclusions. 5.4. Organizes the project in phases and defines decision points/milestones. 5.5. Describes the project organisation including the responsibilities of all project members. 5.6. Writes a communication plan concerning all project members and parties involved. 5.7. Describes a schedule based on the (experimental) plan. 5.8. Describes the required budget. 6.1.Actively involves different specialist to collect advise contributing to the progress of the project.		

HAN_UNIVERSITY OF APPLIED SCIENCES

Managing Projects 2

Title of UOS	***Managing Projects 2*** ***MANAPR10 (PT) / MANAPR03 (FT)***
Degree Programme	Master in Molecular Life Sciences
Target group	Students enrolled in Master in Molecular Life Sciences programme
Title of UOS	Managing Projects 2
Code OSIRIS	MANAPR10 (PT) / MANAPR03 (FT)
Registering for educational components	See Part 3 'OSIRIS Regulations for Education, Exams and Modular Exams' for more information.
Professional task	1.to understand practical, economic, social and/or ecological needs of businesses, market and society that can be anticipated by biotechnology 2. to implement such solutions in a successful and efficient way by organizing their realization in projects, considering the interdisciplinary dimension and communicating with different experts. Such projects have a duration of at least three months.
Professional Products	• SWOT, Personal Development Plan/Start-Stop-Continue and Reflection • Project and professional portfolio
Credits/ study load	7 EC
Relationship with and entry requirements concerning exams	• The modular exam "Professional Toolbox" and of the unit of study Managing Projects 1 is successfully completed for the assessment of "Professional Effectiveness" of the unit of study Managing Projects 2. • The modular exam "Project Proposal" of the unit of study Managing Projects 1 is successfully completed for the assessment of the modular exam "Reflection on Project Proposal Realisation and contribution" of the unit of study Managing Projects 2. • All assessments of this module have to be sufficient.
General description	This unit of study is a follow-up of the Managing Projects 1 course. The focus is on further developing Professional conduct and Professional Development, and Managing Projects skills. Students perform this unit of study in the context of their own (placement) workplace, and are supported in their development by various teaching and assessment activities. The core of this module is the development of Professional Effectiveness. As part of this, students investigate their professional Strengths, Weaknesses, Opportunities and Threats. They define personal learning goals, work on realising these goals in their professional and study context, and reflect on their progression on a regular base. The training inter-personal effectiveness focuses on insights and skills required to efficiently contribute to and control projects within teams. Students become familiar with personal learning styles, leadership styles and communication styles, the concept of situational leadership and different organisational cultures. Principles of time management, how to organise efficient project meetings and ways of dealing with conflicts are also part of this training. At the end of this unit of study, students critically reflect on the project(s) they were involved in and define improvements for their graduation project.

	Students acquire knowledge and understanding during the interactive classes and apply this in practice on their (placement) workplace. This unit of study is integrally carried out with the unit of study Research and Product Development Skills 2 which runs in parallel to this unit of study.
Competences	**Competence 1: Professional conduct and guiding professional development** Competence 3: Design, analysis and control of experiments Competence 4: Communication **Competence 5: Managing projects** Competence 6: Advising
Assessment criteria	***See exams of the UOS Managing Projects 2 below this table***
Exams	***See exams of the UOS Managing Projects 2 below this table***
Compulsory literature	❖ Provided lecture material
Recommended literature	❖ Meyer, E. (2014). The culture map: Decoding how people think, lead and get things done across cultures. "Public Affairs, United States ***The reading lists are updated regularly. Therefore, the actual reading list of this unit of study might deviate from the list presented above.***
Software and other materials	-
Activities	<u>Professional identity</u> - Workshops, Intervision/ supervision <u>Interpersonal effectiveness</u> - Work styles, personal effectiveness, time management - Communication and communication styles - Situational leadership and styles in decision-making - Organisation cultures and handling conflicts, management game - Discussion of practical experiences Lecturers are held in an interactive where transfer of theory is facilitated by discussions and exercises.
Work formats	Internship/workplace/workplace learning, assignments, lectures, tutorial
Lesson/ Contact hours	20 contact hours and 176 hours learning on the (placement) workplace of which 56 hours related to professional products and 120 related to professional development
Compulsory participation	The participation in the placement according to the placement contract is compulsory for students enrolled in the full-time programme.
Education period	P1N, P2N (September 2024 - February 2026)
Maximum number of participants	The maximum number of participants is defined by the number of (placements) workplaces for the full-time programme. The number of participants taking part in this unit of study as part-time or modular student is unlimited.

Exam of the UOS Managing Projects 2

<table>
<tr><td></td><td colspan="3">Assessment criteria/ Indicators / requirements</td></tr>
<tr><td></td><td>Competence indicators</td><td>Body of Knowledge and Skills</td><td>Assessment criteria</td></tr>
<tr><td>Code modular exam:
TOETS-01
Name modular exam:
Reflection on project proposal realisation and contribution
Type:
PRES-F (Presentation on location)

Assessment:
sufficient/insufficient
Cut-off value:
-
Minimal result:
sufficient
Weighting:
0%
Period and resit:
YEAR:2 (December 2024, January 2025)
Compensation:
None</td><td>1.4 Critically reflects on the project with respect to scientific project management approach and results.
1.5 Critically reflect on the own role in the course of a project.
5.13 Is flexible with changing circumstances by adapting the experimental, project and/or communication strategy.</td><td>Depending on context of the (internship) workplace</td><td>See assessment form ‘Reflection on project proposal realization and contribution’ on #OnderwijsOnline – General Information and in the Reader Workplace Learning
-</td></tr>
<tr><td></td><td>Competence indicators</td><td>Knowledge indicators</td><td>For this assignment, these indicators and knowledge criteria are translated into the following assessment criteria</td></tr>
<tr><td>Code modular exam:</td><td></td><td></td><td></td></tr>
</table>

TOETS-02			
Name modular exam: Professional Effectiveness ***Type:*** PERF-F (Performance on location/written) ***Assessment:*** Grade ***Cut-off value:*** 55% ***Minimal result:*** 5.5 ***Weighting:*** 100% ***Period and resit:*** YEAR:2 ***Compensation:*** None	1.1. Shows a professional, pro-active, curious, scientific and entrepreneurial attitude: adapts quickly, motivates him/herself, shows initiative, is goal-oriented, and acts honestly and efficiently 1.2 Works efficiently in a team (colleagues, project leader, client) during all phases of the project through open communication and by considering the needs of others 1.3 Pro-activity contributes to setting up and maintaining a professional network 1.6 Critically reflects on the own personality and how this influences professional conduct. 1.7 Defines personal learning goals (based on project/work requirements) and guides personal development to reach learning goals 4.4 Organises and moderates meetings 4.5 Contributes to the efficiency of meetings by being prepared and actively participating 4.6 Keeps client and project members informed about project progress at all stages, especially when the project is not progressing as planned 4.7 Shows initiative to adapt communication styles to the others and the situation at hand 5.9. Sticks to his/her responsibilities	- has insight into different factors that contribute to an effective communication process - is aware of his own cognitive style and recognizes the styles of team members - knows how to deal with possible conflicts - is aware of intercultural differences. - knows the principles of situational leadership	See assessment form 'Professional Effectiveness' on #OnderwijsOnline – General Information and in the Reader Workplace Learning

	5.10. Approaches others if they do not perform their responsibilities.		

HAN_UNIVERSITY OF APPLIED SCIENCES

Graduation Project

Title of UOS	***Graduation Project*** ***GRADPR15 (PT) / GRADPR14 (FT)***
Degree Programme	Master in Molecular Life Sciences
Target group	Students enrolled in the Master in Molecular Life Sciences programme
Title of UOS	Graduation Project
Code OSIRIS	GRADPR15 (PT) / GRADPR14 (FT)
Registering for educational components	See Part 3 'OSIRIS Regulations for Education, Exams and Modular Exams' for more information.
Professional task	1. to understand practical, economic, social and/or ecological needs of businesses, market and society that can be anticipated by biotechnology 2. to apply fundamental knowledge in the area of molecular life sciences to find sustainable solutions for these needs 3. to implement such solutions in a successful and efficient way by organizing their realisation in projects, considering the interdisciplinary dimension and communicating with different experts. Such projects have a duration of at least three months.
Professional Products	• Project proposal • Scientific Report • Project Portfolio and Review
Credits/ study load	30 EC
Relationship with and entry requirements concerning exams	• Successful completion of the exam of the unit of study "Fundamentals", "Drug Discovery and Development", "Production of Biomolecules 1 and 2", "Vaccines and Diagnostics" except for one modular exam in one of these modules and submission of the Business plan (belonging to "Vaccines and Diagnostics" module) • Successful completion of the exam of the unit of study "Research and Product Development Skills 1 and 2" and "Managing Projects 1 and 2"
General description	The Graduation Project is the final proof of competence of the Master Molecular Life Sciences programme. Students show that they can plan, carry out and manage a project in a self-driven manner, thereby demonstrating all final qualifications of this degree course. The graduation project is anchored in the internship/workplace environment of each student and concerns applied science or product development in life sciences / biotechnology. It comprehends a period of 21 weeks full-time (up to 42 weeks part-time), including project planning and closeout. Students write a complete project proposal and realise the project according to this. They track their project management actions and results and document these in a portfolio. The project is closed out with a scientific report and portfolio assessment.

Competences	Competence 1: Professional conduct and guiding professional development Competence 2: Designing strategies for applied research and product development Competence 3: Design, analysis and control of experiments Competence 4: Communication Competence 5: Managing projects Competence 6: Advising
Assessment criteria	*The assessment criteria are directly derived from the following final qualifications (**see also the exams of the UOS Graduation Project below**):* *Competence 1: Professional conduct and guiding professional development* 1.1. Shows a professional, pro-active, curious, scientific and entrepreneurial attitude adapts quickly, motivates him/herself, shows initiative, is goal-oriented, and acts honestly and efficiently 1.2. Works efficiently in a team (colleagues, project leader, client) during all phases of the project through open communication and by considering the needs of others. 1.3. Pro-activity contributes to setting up and maintaining a professional network. 1.4. Critically reflects on the project with respect to scientific project management approach and results. 1.5. Critically reflect on the own role in the course of a project. 1.6. Critically reflects on the own personality and how this influences professional conduct. 1.7. Defines personal learning goals (based on project/work requirements) and guides personal development to reach learning goals *Competence 2: Designing strategies for applied research and product development* 2.1. Is able to independently acquire knowledge in a new subject by consulting specific literature and other resources; is able to identify reliable and suitable sources; Discriminates between major and side issues 2.2. Combines information from different sources in the context of the own project 2.3. Defines the project aim in terms of products and/or results based on the acquired background information 2.4. Defines the quality requirements for products and processes based on legal requirements. 2.5. Designs different approaches that could lead to the project aim. Evaluates these possibilities and justifies the choice based on scientific arguments and practical parameters such as time, costs, quality and personnel 2.6. Designs a complete strategy leading to the project aim (project of about 3-4 months; see also: managing projects) 2.7. Identifies opportunities to patent products, results and strategies *Competence 3: Design, analysis and control of experiments* 3.1. Designs experiments based on the required quality and quantity of the product or result. 3.2. Applies strict logical thinking to draw conclusions from the results and interprets them: - in the context of the experiments - in the context of the project aim (helicopter view) - in comparison to other analyses, reference/theoretical values, and quality requirements.

	3.3. Solves practical problems if experiments do not work as planned (trouble shooting); couples back to the theory or consults colleagues if necessary; suggests alternative experiments. *Competence 4: Communication* 4.1. Reports project plans and results according to the standard format of scientific documents and meets the scientific international conventions criteria 4.2. Presents project plans and results in English to colleagues, other researchers in the field or to clients. The presentation is at a level equivalent to a presentation at an international symposium 4.3. Describes the key message of the project relevant for patenting, registration, and/or business development. Uses terminology that is understandable for experts from different departments 4.4. Organises and moderates meetings 4.5. Contributes to the efficiency of meetings by being prepared and actively participating 4.6. Keeps client and project members informed about project progress at all stages, especially when the project is not progressing as planned 4.7. Shows initiative to adapt communication styles to the others and the situation at hand *Competence 5: Managing projects* Takes responsibility for a project by: 5.1. Defines project deliverables based on the needed quality and quantity 5.2. Identifies project risks based on the (experimental) approach and on (putative) competitors 5.3. Defines project exclusions 5.4. Organizes the project in phases and defines decision points/ milestones 5.5. Describes the project organisation including the responsibilities of all project members 5.6. Writes a communication plan concerning all project members and parties involved 5.7. Describes a schedule based on the (experimental) plan 5.8. Describes the required budget 5.9. Performs his/her responsibilities 5.10. Approaches others if they do not perform to their responsibilities 5.11. Sets priorities and works efficiently towards the defined project aim/deliverables 5.12. Is in control of the project during all phases by being pro-active if the project does not run according to the plans and initiating an alternative strategy 5.13. Is flexible with changing circumstances by adapting the experimental, project and/or communication strategy 5.14. Obtains the deliverables in time and with the described resources; if not, reasons and justifies the decisions that have been taken in the course of the project *Competence 6: Advising* 6.1. Actively involves different specialists to collect advice contributing to the progress of the project. 6.2. Actively participates in a discussion about related projects by asking critical questions and suggesting follow-up experiments. 6.3. Advises about follow-up projects of the own project. 6.4. Integrates own project results in the multidisciplinary defined goals and advises other departments 6.5. Gives advice about choosing new equipment or methods based on project goals, overall goals and available resources
Exams	***See exams of the UOS Graduation Project below this table***

Compulsory literature	• Graduation project handbook • Specialized literature relevant to the project
Recommended literature	Scientific literature relevant to the specific project
Software and other materials	Dependent on the specific project
Activities	Placement in the professional practice
Work formats	Internship/workplace/workplace learning
Lesson/ Contact hours	Approximately 10 contact hours with HAN lecturers
Education Period	P1N, P2N, P3N, P4N (September 2024- August 2025)

Exam of the UOS Graduation Project

<table>
<tr><td></td><td colspan="3">Assessment criteria/ Indicators / requirements</td></tr>
<tr><td></td><td>Competence indicators</td><td>Body of Knowledge and Skills</td><td>Assessment criteria</td></tr>
<tr><td>Code modular exam:
TOETS-01</td><td>Competence indicators</td><td>Knowledge indicators</td><td>These competence and knowledge criteria are translated into the following assessment criteria</td></tr>
<tr><td>Name modular exam:
Project proposal</td><td rowspan="9">2.1. Is able to independently acquire knowledge in a new subject by consulting specific literature and other resources; is able to identify reliable and suitable sources; discriminates between major and side issues.
2.2. Combines information from different sources in the context of the own project to result in a relevant and comprehensive proposal.
2.3. Defines the project aim in terms of products and/or results based on the acquired background information.
2.4. Defines the (quality) requirements for products and processes based on customer / legal requirements.
2.6. Designs a complete strategy leading to the project aim. (project of about 3-4 months; see also: managing projects)
2.7. Identifies opportunities to patent products, results and strategies.
3.1. Designs experiments based on the required quality and quantity of the product or result.
5.1. Defines project deliverables based on the needed quality and quantity.</td><td rowspan="9">Depending on context of the (internship) workplace.</td><td rowspan="9">See assessment form ‘Graduation Project Proposal’ on #OnderwijsOnline – General Information and in the Reader Graduation Project</td></tr>
<tr><td>Type:
PROD-O (Online/digital (professional) product)</td></tr>
<tr><td></td></tr>
<tr><td>Assessment:
Grade</td></tr>
<tr><td>Cut-off value:
55%</td></tr>
<tr><td>Minimal result:
5.5</td></tr>
<tr><td>Weighting:
20%</td></tr>
<tr><td>Period and resit:
Year:2
(Chance 1: 4 weeks after start Graduation Project</td></tr>
</table>

Chance 2: 4 weeks after assessment version 1) ***Compensation:*** None	5.2. Identifies project risks based on the experimental approach and on (putative) competitors. 5.3. Defines project exclusions. 5.4.Organizes the project in phases and defines decision points. 5.5. Describes the project organisation including the responsibilities of all project members 5.6. Writes a communication plan concerning all project members and parties involved. 5.7. Describes a schedule based on the experimental plan. 5.8. Describes the required budget.		
Code modular exam: TOETS-02	*Competence indicators*	*Knowledge indicators*	*These competence and knowledge criteria are translated into the following assessment criteria*
Name modular exam: **Report** ***Type:*** PROD-O (Online/digital (professional) product) ***Assessment:*** Grade ***Cut-off value:*** 55% ***Minimal result:*** 5.5 ***Weighting:*** 25% ***Period and resit:*** YEAR:2	2.1. Is able to independently acquire knowledge in a new subject by consulting specific literature and other resources; is able to identify reliable and suitable sources; discriminates between major and side issues. 2.2. Combines information from different sources in the context of the own project. 3.2. Applies strict logical thinking to draw conclusions from the results and interprets them in the context of the experiments, in the context of the project aim (helicopter), and in comparison to other analyses, reference/theoretical values and quality requirements.	*Depending on context of the (internship) workplace.*	See assessment form 'Graduation Scientific Report' on #OnderwijsOnline – General Information and in the Reader Graduation Project

(Chance 1: End of Graduation Project Chance 2: 4 weeks after assessment version 1) ***Compensation:*** None	4.1.Reports project plans and results according to the standard format of scientific documents and meets the scientific international conventions criteria. 6.3. Advises about follow-up projects.		
	Competence indicators	*Knowledge indicators*	*These competence and knowledge criteria are translated into the following assessment criteria*
Code modular exam: ***TOETS-03***			
Name modular exam: **Workplace assessment** ***Type:*** PERF-O (Online/digital performance) ***Assessment:*** Grade ***Cut-off value:*** 55% ***Minimal result:*** 5.5 ***Weighting:*** 25% ***Period and resit:*** YEAR:2	1.1. Shows a professional, pro-active, curious, scientific and entrepreneurial attitude: adapts quickly, motivates him/herself, shows initiative, is goal-oriented, and acts honestly and efficiently. 1.2. Works efficiently in a team (colleagues, project leader, client) during all phases of the project through open communication and by considering the needs of others. 2.5. Designs different approaches that could lead to the project aim. Evaluates these possibilities and justifies the choice based on scientific arguments and practical parameters such as time, costs, quality and personnel. 3.1. Designs experiments based on the required quality and quantity of the product or result.	Depending on context of the (internship) workplace.	See assessment form 'Graduation Workplace assessment' on #OnderwijsOnline – General Information and in the Reader Graduation Project

(Chance 1: End of Graduation Project Chance 2: 4 weeks after assessment version 1) ***Compensation:*** None	3.3. Solves practical problems if experiments do not work as planned (trouble shooting). Couples back to the theory or consults colleagues if necessary. Suggests alternative experiments. 4.2. Presents project plans and results in English to colleagues, other researchers in the field or to clients. The presentation is at a level equivalent to a presentation at an international symposium. 4.4. Organises and moderates meetings. 4.5. Contributes to the efficiency of meetings by being prepared and actively participating. 4.6. Keeps client and project members informed about project progress at all stages, especially when the project is not progressing as planned. 4.7. Shows initiative to adapt communication styles to the others and the situation at hand. 5.9. Performs his/her responsibilities. 5.10. Approaches others if they do not perform their responsibilities. 5.11. Sets priorities and works efficiently towards the defined project aim. 5.12. Is in control of the project during all phases by being pro-active if the project does not run according to the plans and initiating an alternative strategy. 5.13. Is flexible with changing circumstances by adapting the experimental, project and/or		

	communication strategy. 5.14. Obtains the deliverables in time and with the described resources; if not, reasons and justifies the decisions that have been taken in the course of the project. 6.1. Actively involves different specialist to collect advise contributing to the progress of the project. 6.2. Actively participates in a discussion about related projects by asking critical questions and suggesting follow-up experiments. 6.4. Integrates own project results in the multidisciplinary defined goals and advises to other departments. 6.5. Gives advice about choosing new equipment or methods based on project goals, overall goals and available resources.		
Code modular exam: ***TOETS-04***	*Competence indicators*	*Knowledge indicators*	*These competence and knowledge criteria are translated into the following assessment criteria*
Name modular exam: **Portfolio Assessment** ***Type:*** PORT-O (Online/digital portfolio) ***Assessment:*** Grade ***Cut-off value:*** 55%	1.3. Pro-actively contributes to setting up and maintaining a professional network. 1.4. Critically reflects on the project with respect to scientific project management approach and results. 1.5. Critically reflects on the own role in the course of the project. 1.6.Critically reflects on the own personality and how this influences	Depending on context of the (internship) workplace.	See assessment form 'Graduation Portfolio Assessment' on #OnderwijsOnline – General Information and in the Reader Graduation Project

Minimal result: 5.5 ***Weighting:*** 30% ***Period and resit:*** YEAR:2 (Chance 1: End of Graduation Project Chance 2: 4 weeks after assessment version 1) ***Compensation:*** None	professional conduct. 1.7. Defines personal learning goals (based on project/work requirements) and guides personal development to reach learning goals. 2.7. Identifies opportunities to patent products, results and strategies. 4.2. Presents project plans and results in English to colleagues, other researchers in the field or to clients. The presentation is at a level equivalent to a presentation at an international symposium 4.3. Describes the key message of the project relevant for patenting, registration, and/or business development. Uses terminology that is understandable for experts from different departments. 4.4. Organises and moderates meetings. 4.5. Contributes to the efficiency of meetings by being prepared and actively participating. 4.6. Keeps client and project members informed about project progress at all stages, especially when the project is not progressing as planned. 5.2. Identifies project risks based on the experimental approach and on (putative) competitors. 5.11. Sets priorities and works efficiently towards the defined project aim. 5.13. Is flexible with changing circumstances by adapting the		

	experimental, project and/or communication strategy. 5.14. Obtains the deliverables in time and with the described resources; if not, reasons and justifies the decisions that have been taken in the course of the project. 6.1. Actively involves different specialists to collect advise contributing to the progress of the project. 6.4. Integrates own project results in the multidisciplinary defined goals and advises to other departments.		